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FOREWORD

The 2020 edition of UN Activities on Artificial Intelligence (AI) takes a deep dive into the technologies behind the more than 260 projects that are being developed by UN agencies to address some of the greatest global challenges in the history of the United Nations, including the COVID-19 pandemic.

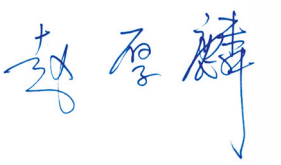
At a time when the coronavirus crisis is disrupting progress toward the achievement of the United Nations Sustainable Development Goals (SDGs),[1] these projects serve as a reminder that AI and other digital technologies can reverse this trend and accelerate progress in areas as fundamental to our future as climate change, poverty, energy, education, biodiversity, and health. It also makes clear that we, as UN agencies, will not rest until everyone, everywhere is connected and can benefit from these technologies.

For its part, ITU strives to build common understanding and trust around the use of AI for environmental efficiency, health, autonomous and assisted driving, 5G, and several others. In everything we do, we ensure that all voices are heard – like with the AI for Good Global Summit, recognized in the UN Secretary-General's Roadmap for Digital Cooperation as an important tool to understand how AI can best be deployed to support the achievement of the SDGs.[2]

For AI to truly be a force for good, it must address challenges ranging from job displacement to autonomous weapons to algorithm bias. I echo all those agencies in this year's document who called for the development of ethical AI frameworks and for the capacity gap between more and less developed countries to be filled. Developing safe, trusted, and inclusive AI solutions is paramount, both inside and outside our organizations.

Today, we are in a race to achieve the Sustainable Development Goals and connect all people by 2030. In this race against time, amid the worst human and economic crisis of our lifetime, AI and other digital technologies are among our best allies.

I congratulate all 36 UN agencies on their AI activities, reaffirm ITU's role in shaping the future of AI and other emerging technologies, and recommend this publication to all those committed to ensuring that artificial intelligence serves as a positive force for all of humanity.



Houlin Zhao
Secretary-General
International Telecommunication Union

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1 *See* UN report finds COVID-19 is reversing decades of progress on poverty, healthcare and education, UN DESA, 7 July 2020, https://www.un.org/development/desa/en/news/sustainable/sustainable-development-goals-report-2020.html

2 *See* Report of the Secretary-General, Roadmap for Digital Cooperation, June 2020, at p. 18, available at https://www.un.org/en/content/digital-cooperation-roadmap/assets/pdf/Roadmap_for_Digital_Cooperation_EN.pdf

Introduction

The **AI for Good** series is the leading UN platform for multi-stakeholder dialogue on Artificial Intelligence (AI). The International Telecommunication Union (ITU), as the UN specialized agency for information and communication technologies (ICTs), is organizing the annual "AI for Good Global Summit" in partnership with sister UN agencies and identify and scale practical applications of AI in support of the Sustainable Development Goals

Due to the COVID-19 pandemic, the 2020 edition of AI for Good Global Summit is being held online, with activities connecting AI innovators with public and private sector decision-makers taking place throughout the year. This year, the AI for Good UN Partnership includes 38 UN agencies and bodies: CTBTO, FAO, ICAO, ILO, IMO, IOM, ITU, UNAIDS, UNCTAD, UNDESA, UNDPPA, UNECE, UNEP, UNESCO, UNDP, UNFCCC, UNFPA, UNGP, UN Habitat, UNHCR, UNICEF, UNICRI, UNIDIR, UNIDO, UNDRR, UNITAR, UNODA, UNODC, UNOOSA, UNRISD, UNU, UN Women, UN WTO, WFP, WHO, WIPO, WMO, and the World Bank Group.

The Compendium of 'UN activities on Artificial Intelligence' is a joint effort of this partnership. The 2020 Compendium covers around 260 cases and projects run by 36 UN agencies and bodies, an increase of almost 75% since last year's compendium, in areas ranging from smart agriculture and food systems to transportation, financial services, and healthcare – including AI solutions to combat COVID-19. This compendium is not intended to produce an exhaustive inventory of the UN system's work on AI. Rather, it is a tool to further collaboration and build common understanding around emerging AI technologies.

The 2020 Compendium of UN activities on AI will be presented and discussed at the 6th AI for Good UN Partners Meeting to take place virtually on Monday, 21 September 2020. At the meeting, participants will discuss the ongoing efforts to enhance the partnership for continued collaboration, cooperation, and coordination. This compendium will also be further used to develop an online multi-stakeholder platform, developed jointly by ITU and UNEP in 2021, to accelerate innovations in AI development, including the creation of a standardized AI capability catalogue for all UN agencies and bodies.

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CTBTO
PREPARATORY COMMISSION

Comprehensive Nuclear-Test-Ban Treaty Organization

1. Description of Activities on AI

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans nuclear explosions on the Earth's surface, in the atmosphere, underwater and underground. The Treaty has a unique and comprehensive verification regime consisting of three pillars:

- The International Monitoring System (IMS) will, when complete, consist of 337 facilities worldwide to monitor the planet for signs of nuclear explosions. Around 90 percent of the facilities are already up and running.
- The International Data Centre (IDC) at the CTBTO's headquarters in Vienna acquires data from the IMS monitoring stations. The data are processed automatically, reviewed by human analysts and distributed to the CTBTO's Member States in both raw and analyzed form. On-site inspections (OSI) can be dispatched to the area of a suspected nuclear explosion if data from the IMS indicate that a nuclear test has taken place there. Inspectors collect evidence at the suspected site.

Artificial Intelligence (AI) is applied in all three pillars of the verification regime as outlined below.

Project 1: To detect fall army worm damage using a mobile application

Classifying signals from seismic stations to determine their seismic phase based on features measured automatically. The features include amplitude, frequency content, particle motion parameters, etc. Manual data processing of signals from seismic stations is cumbersome thus the need to automate data processing at ICTBTO's International data center.

- Project Type (Status): Software project (Proof of concept)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: Artificial Neural Networks (ANN) and Bayesian Classifiers
- Datasets: Automatic signals from the International Monitoring System (IMS), reviewed and corrected by human analysts.
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Resources/Skills: Human experts to review and correct the signals from seismic stations of IMS
- Technology: Deep Learning
- Challenges: Improvement of the current system by retraining the existing ANNs on a per station basis and replacing the ensemble of ANN and Bayes Classifiers with a deeper ANN. Methods are being explored for seismic phase identification directly from the waveform signal. Further studies are being undertaken to determine if the use of additional information, such as the raw waveform data, during classification can further improve performance

Project 2: Network Processing of detected signals to determine the events that have triggered them

Detection of events by on-site inspections for every signal detected is time consuming and expensive hence the need for network processing of signals detected at seismic, infrasound and hydro-acoustic stations in determining the events that have caused these signals to be observed.

- Project Type (Status): Software project (Deployment)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: Rule-based
- Datasets: Signals detected at seismic, infrasound and hydro-acoustic stations of IMS
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Challenges: Further research is being undertaken on the classification of radionuclide spectra by ANNs

Project 3: NET-VISA (NETwork processing Vertically Integrated Seismic Analysis)

Improvement of the current rule-based system.

- Project Type (Status): Software project (Deployed)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: Machine Learning + physics model. The theoretical underpinnings are based on the "Open Universe Probability Model"
- Datasets: Signals detected at seismic, infrasound and hydro-acoustic stations of IMS
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: University of California (developing NET-VISA software)
- Resource: Bayesian approaches. Knowledge of seismic, infrasound, and hydro data
- Challenges: Extending to stations without detailed history from which to derive priors.

Project 4: Automatic triage

Distribute certain trouble tickets based on their content.

- Project Type (Status): Software project (Deployment)
- Project Domain: Global nuclear explosion monitoring
- Datasets: Signals detected at seismic, infrasound and hydro-acoustic stations of IMS
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions

Project 5: Predicting failure at IMS stations

Predicting failure at IMS stations based on extensive State Of Health (SOH) parameters that are continuously collected and store.

- Project Type (Status): Software project (Deployed)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: Statistical methods and rule-based system; Next approach: ANNs and Support Vector Machines (SVM).
- Datasets: IMS data and noble gas monitoring system SOH data.
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Pacific National Northwest Laboratory (PNNL)

Project 6: Seismic aftershock monitoring

Monitoring changes in the geological structures caused by a possible nuclear explosion and classifying "weak" detections produced to enable separation of noise from signals of interest (aftershocks).

- Project Type (Status): Software project (Testing)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: AI-based technique and Self Organizing Map (SOM)
- Datasets: IMS raw waveform data
- Related SDGs: SDG Peace, Justice and Strong Institutions
- Project Partners: University of Stuttgart (developed AI-based technique)

Project 7: Satellite monitoring for On Site Inspection (OSI)

The use of air-and-spaceborne multispectral imagery (MSIR) for classification and change detection in the inspection area, with the ultimate goal of limiting the search area and detecting features of interest.

- Project Type (Status): Software project (Ideation)
- Project Domain: Global nuclear explosion monitoring
- AI Approach: Pixel-based classification (unsupervised and supervised Machine learning), object-based classification (decision rules and fuzzy-logic) and Change detection techniques using Multivariate Alteration Detection (MAD)
- Datasets: Air and Space-borne multispectral imagery (MSIR)
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Resource: GIS (Geographic Information Systems) operations
- Challenges: Timeframe during an 'On Sight Inspection (OSI)' (e.g. availability of imagery)

2. Related Sustainable Development Goals (SDGs)

SDG 16. Peace, Justice and Strong Institutions

3. Relevant links

www.ctbto.org

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Food and Agriculture Organization of the United Nations

The Food and Agriculture Organization

1. Description of Activities on AI

Project 1: To detect fall army worm damage using a mobile application

The FAMEWS global platform is an online resource for mapping data collected by the FAMEWS mobile app whenever fields are scouted or pheromone traps are checked for FAW. The platform provides a real-time situation overview with maps and analytics of FAW infestations at global, country and sub-country levels. The data and maps provide valuable insights on how FAW populations change over time with ecology in order to better understand its behaviour and guide best management practices.

- Project Status: In use
- Project Partners: PlantVillage, Penn State
- Project Website (links): http://www.fao.org/fall-armyworm/monitoring-tools/famews-global-platform/en/, http://www.fao.org/3/CA1089EN/ca1089en.pdf, https://plantvillage.psu.edu/solutions

Project 2: Port inspectors, custom agents, fish traders and other users without formal taxonomic training, iSharkFin allows the identification of shark species from a picture of the fin

iSharkFin is an expert system that uses machine learning techniques to identify shark species from shark fin shapes. The software was developed by FAO in collaboration with the University of Vigo with financial support from the Government of Japan and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Aimed at port inspectors, custom agents, fish traders and other users without formal taxonomic training, iSharkFin allows the identification of shark species from a picture of the fin.

- Project Status: In use
- Project Partners: University of Vigo, Spain
- Project Website (links): http://www.fao.org/ipoa-sharks/tools/software/isharkfin/en/

Project 3: Land cover / crop classification using satellite imaginary, phenology and ground reference data

WAPOR is supervised classification methodology is applied to assign a specific class to each pixel of the image. Training data consist of seasonal and long term metrics derived from dekadal NDVI time series, phenology and spectral reflectance data combined with reference data denoting the exact location of each of the classes.

- Project Status: In use
- Project Partners: FRAME Consortium

- Project Website (links): https://wapor.apps.fao.org/catalog/3/L3_LCC_BKA_D, http://www.fao.org/3/CA1081EN/ca1081en.pdf

Project 4: Palm tree mapping from satellite imagery (Internal, In use)

Project 5: Fleet estimation (Internal, In use, Used for improving fisheries statistics)

Project 6: Fishing gear identification

Based on vessel position movement patters identifying the gear type and type of fishing activity

- Project Status: In use
- Project Partners: Global Fishing Watch
- Project Website (links): https://globalfishingwatch.org/vessel-tracking-data/

Project 7: Detecting Fall Armyworm infestations

An innovative, talking app- Nuru- to help African farmers recognize Fall Armyworm, a new and fast-spreading crop pest in sub-Saharan Africa, so that they can take immediate steps to destroy it and curb its spread.

- Project Status: In use
- Project Partners: Penn State University

Project 8: FAO Data Lab

FAO's Big Data tool on food chains under the COVID-19 pandemic. This open-access tool developed by the FAO Data Lab gathers, organizes and analyses daily information on the impact of the COVID-19 pandemic on food and agriculture, value chains, food prices, food security and undertaken measures.

- Project Status: In use
- Project Partners: Global Fishing Watch
- Project Website (links): https://datalab.review.fao.org/

Project 8: Hand-in-Hand Initiative Geospatial Platform

Using machine-learning for image classification and knowledge discovery. Using natural language processing for queries.

- Project Status: In development (Internal)
- Project Website (links): https://data.apps.fao.org/

2. Description of Possible Projects on AI

Project 1: Chatbot for employment page (OHR)

Using Dialog Flow, the idea is to provide a chat bot that could answer to the most common questions (FAQ) on employment process, using natural language processing.

- Project Status: In development
- Project Partners: Prospecting phase; currently interested in DataMatics
- Project Website (links): https://bot.dialogflow.com/087f3871-be01-448d-a037-a553309e7873

Project 2: Animal diseases identification from images

Part of the work of the company was showcased on Google I/O 2019 Keynotes.

- Project Status: Planned
- Project Partners: Hansu Mobile Innovation
- Project Website (links): https://youtu.be/LoLqSbV1ELU (from 56:34 to 57:30), https://hansumi.com/fapp.html

Project 3: Pelagic fishing (Planned, Internal)

Help estimate the pelagic fishing fleet sizes and potential activity

Project 4: Fish Species Identification (Planned, Internal)

Identification of fish species using image recognition and machine learning

Project 5: Small Scale fishing activity based on mobile coverage (In development, Prospecting)

Using the mobile phone coverage and distance from shore along with in and out of range to identify the fishing activity

Project 6: Aquaculture mapping (In development, Google Earth Engine)

Inventory mapping of Aquaculture sites and structures

Project 7: Fish Rack Drying capacity (Planned, Internal)

Fish rack infrastructure capacity availability within a given zone

3. Challenges and Opportunities

There are claims that AI capabilities will someday exceed human capabilities, and in many areas, they already come close to this benchmark. With this in mind, we would like to comment on the seven AI principles. In general, we believe these principles are an excellent start. They are about a sine qua non condition, but are insufficient to cover all facets of this embryonic field on the fourth industrial revolution.

Therefore, FAO would like to highlight that Artificial Intelligence is an entire domain of knowledge and should not be seen only as a tool or a menace. We believe that more intensive learning and training is needed in this area to understand the technology and its implications. Today we see AI portrayed in a sensationalistic manner, and can be easily distracted by the rapid advancements and fantastic scenarios envisioned for future use, while we search for appropriate use cases in the core functions of our business. We need to understand that AI is a series of algorithms based on data (evidence or observations), which will continue to get smarter and more pervasive, eventually surpassing human capacities in many activities (faster and more precise) though never quite the same as human beings. That said, even today there are many areas of work aiming to build self-conscious machines. Therefore, to focus the core of this approach in one type of technology (AI) could be an error, and we propose to expand the scope of this approach, to understand the implications and potential benefits of technology more broadly, and how this could be oriented in terms of policymakers and principles.

The UN needs to exploit the topic widely in order to build a holistic approach local and globally. The most important role of AI is outside of the seven proposed principles and should be included as

fundamental to our approach to AI. This role is the ability to use AI to predict unexpected events, threats and crises. Challenges such as hunger, climate change, and migration could be addressed before they become crises through early detection, prevention and mitigation of natural disasters, social conflicts or economic hazards.

Despite this caveat, we concur with the seven guiding principles, and will interpret them through the lens of the impact of AI on food security and ensuring that any programmes implemented by FAO do not increase the digital divide and risk creating or increasing food insecurity, especially for those at risk of being left behind.

There is no doubt that AI, and other technologies, and its applications will replace jobs4, 5, and this is a widely accepted consequence of all technology that has resulted from the industrial revolution. However, this does not need to be seen as an entirely negative consequence, assuming that we can successfully promote other types of jobs. At FAO, we believe that AI policies and programmes of member states need to be oriented to contribute to job and entrepreneurship opportunities creation for Youth in developing countries. This development should induce young people to remain in the rural areas with employment perspective and suitable livelihoods conditions.

At FAO, we would like to see a better understanding in terms of the technologies (AI and others), as an incomplete understanding can lead to biased assumptions with regards to comprehension and analysis of strategies for consideration and implementation. The text indicated that AI is complex, and therefore, we are unnecessarily limiting our analysis in terms of understanding and capability to manage this technology. In general, AI is a set of algorithms and methodology to process data and use them to improve the precision and response time to make or support decision (classification, forecast, etc.). We propose that a better understanding will lead to the ability to provide a more fair and sound assessment. Therefore, we suggest that important training is provided to those who will create the UN's strategy for AI in terms of what the technology is, what it can do, and the implication for our business.

In terms of the four points mentioned: (a) infrastructure; (b) data; (c) human; and (d) policy/law/human rights, we concur with all of them. However, we consider that the infrastructure area is a topic by itself, because it is important to bring other capabilities, technologies and solutions to eliminate the digital divide and promote innovation, jobs and fairness. We recognize that this is a good-to-have for AI, but it is not a necessary condition, because AI solutions could also be used offline. Therefore, we propose to have a different, separate note dedicated to the need to increase connectivity and reduce the digital dive.

4. Related Sustainable Development Goals

SDGs 1, 2, 3, 8, 9, and 10

5. Relevant links

- e-Agriculture: http://www.fao.org/e-agriculture/
- 2019 International Seminar on Digital Agriculture Transformation: The challenges to be addressed: http://www.fao.org/about/meetings/digital-agriculture-transformation/en/
- 2019 Status Report on Digital Technologies in Agriculture and Rural Areas: http://www.fao.org/3/ca4985en/ca4985en.pdf

- 2019 Briefing Paper on the Status Report on Digital Technologies in Agriculture and Rural Areas: http://www.fao.org/3/ca4887en/ca4887en.pdf
- FAO Digital Services Portfolio: http://www.fao.org/about/meetings/digital-agriculture-transformation/resources/fao-digital-services-portfolio/en/
- Innovation at FAO: http://www.fao.org/innovation/en/
- 2018 Info Note on Tackling Poverty and Hunger through Digital Innovation: http://www.fao.org/3/ca1040en/CA1040EN.pdf
- 2018 International Symposium on Agricultural Innovation for Family Farmers: http://www.fao.org/about/meetings/agricultural-innovation-family-farmers-symposium/en/
- 2018 Innovation Fair: http://www.fao.org/about/meetings/agricultural-innovation-family-farmers-symposium/innovation-fair/en/
- 2018 Proceedings of the international symposium on agricultural innovation for family farmers: http://www.fao.org/3/ca4781en/ca4781en.pdf
- e-Agriculture in Action: Drones for Agriculture: http://www.fao.org/3/i8494en/I8494EN.pdf

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International Labour Organisation

1. Description of Activities on AI

Project 1: From industrial robots to deep learning robots: the impact on jobs and employment

The study investigates empirically the rise of reprogrammable industrial robots in developing countries and how they affected manufacturing employment during the past two decades. Secondly, it explores patent data in the two areas of robotics and artificial intelligence, and analyses this data at the levels of countries, sectors and enterprises so as to better understand the future impact of AI robots on jobs and employment.

- Project Type (Status): Research/Study paper (On-going)
- Project Domain: Job and Employment
- AI Approach: Research
- Datasets: Patent filing data (WIPO), Employment data (ILO), International Federation of Robotics (IFR)
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 9 Industry, Innovation and – Infrastructure
- Project Partners: WIPO
- Project Website (links): https://www.researchgate.net/publication/315408966_New_technologies_A_jobless_future_or_a_golden_age_of_job_creation
- Resources/Skills: Research skills in empirical analysis and data exploration
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 2: The economics of Artificial Intelligence (AI): Implications for the future of work

The study explores the economics of AI and how it relates to the labor market. It discusses the rationale for the fears of job loss as a result of AI advancements and calls for a moderately optimistic outlook on the opportunities and risks from artificial intelligence, provided policy-makers and social partners take the particular characteristics of these new technologies into account.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Future of Work
- AI Approach: Research
- Datasets: Literature review and research information on the economics of AI and how it relates to the labor market
- Related SDGs: SDG 8 Decent work and Economic growth

- Project Partners: Institute for Employment Research
- Project Website (links): https://www.researchgate.net/publication/328353684_The_economics_of_artificial_intelligence_Implications_for_the_future_of_work
- Resources/Skills: Research skills in data and data exploration
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 3: Policy responses to the distributional consequences of AI

The study paper addresses digital dystopias and the rise in digital inequality. It suggests that the answer lies in treating data as a commons and Big Data as a collective-action problem.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Job and Employment
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 8 Decent work and Economic growth
- Project Website (links): https://www.researchgate.net/publication/334138800_Big_Data_and_its_enclosure_of_the_commons
- Resources/Skills: Research skills
- Technology: Research Gate
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 4: Skills and strategies for future labor markets

This project aims to help ILO constituents to develop forward looking strategies to more readily adapt skills training to labour market demand in response to industrial, sectoral, trade, technology and environmental developments, including Artificial Intelligence. The project in particular reviews broadly the existing literature on digitisation and changing skills demand, undertakes sector case studies and explores new methodologies.

- Project Type (Status): Report (On-going, Report to be published soon)
- Project Domain: Future of Work
- AI Approach: Framework/Strategy/Methodology Formation
- Datasets: Literature review and case studies on digitisation and changing skills demand in labour markets
- Related SDGs: SDG 8 Decent work and Economic growth
- Project Website (links): https://www.ilo.org/skills/areas/skills-training-for-poverty-reduction/lang--en/index.htm
- Resources/Skills: Research skills
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 5: The future of work and the teaching profession

Focuses on the impact of new technologies on the teaching profession in the context of the future of work, and explores emerging skills needs, new pedagogical approaches, and the future management and governance of teachers. It aims to showcase trends and examples from all geographic regions; however, due to limited literature and research on the topic, it draws primarily from industrialized countries.

- Project Type (Status): Report (Closed)
- Project Domain: Future of Work
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 4 Quality Education, SDG 8 Decent work and Economic growth
- Project Partners: UNESCO
- Project Website (links): https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/meetingdocument/wcms_675238.pdf
- Resources/Skills: Research skills
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 6: Skills shortages and labor migration in the field of information and communication technology in India, Indonesia and Thailand

To gain a more comprehensive understanding of the most critical aspects of the future of work in the ICT sector by assessing how technological changes, employment, migration and the organization of work and production in India, Indonesia and Thailand may be interrelated. The analysis focuses on the following three areas: (I) trends in the ICT sector and labor markets; (ii) the potential demand for ICT jobs and the anticipated shortages of skilled workers in the digital economy, as well as approaches for improving the education and training of ICT workers; (iii) factors affecting the migration of highly-skilled ICT workers.

- Project Type (Status): Report (Development)
- Domain: Future of Work
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 8 Decent work and Economic growth
- Project Partners: ITU (provide inputs)
- Project Website (links): https://www.ilo.org/skills/areas/skills-training-for-poverty-reduction/lang--en/index.htm
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 7: The future of work in textiles, clothing, leather and footwear, including the Potential application and use of digital technologies

This paper explores how technological advances, climate change, globalization and changing demographics will shape industries in the future. It then analyses the challenges and opportunities these drivers and megatrends bring for the realization of decent work. This is followed by a discussion of the future of TCLF production in three different categories of countries. The paper concludes with

a call for action to shape a future that works for all – for the tens of thousands of mostly small and medium-sized enterprises as well as the millions of mostly young women workers that produce the clothes, shoes, and accessories we all wear.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Future of Work
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 9 Industry, Innovation and Infrastructure
- Project Website (links): https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_669355.pdf
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 8: The Future of Shopping: personal consumption, sustainable development and decent work

This paper examines the labour dimensions of the shopping economy, discussing evidence of changing trends vis-à-vis technological changes, demographic trends and environmental sustainability. In particular, it analyses how current business models in the shopping economy have displaced and continue to displace jobs, with possible implications for greater job polarization, low wages, and vulnerable employment. Furthermore, looking at the environmental costs of mass production and consumption, it discusses patterns and implications that an alternative sustainable shopping model may have on the economy and on the employment. The paper then makes suggestions for policy options for governments, employer and worker organizations to reconcile employment and growth with the environmental constraints of consumer-led growth. In particular, it concludes that while the adoption of green technologies in production, transport, distribution and disposal of consumer goods are part of the answer to the problem, alternative macroeconomic models to consumer-led growth will need to be considered.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Future of Work
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 12 Responsible consumption and production
- Project Website (links): https://unfashionalliance.org/events/2019-regulating-for-decent-work-conference-research-on-the-textiles-and-clothing-sector/
- Challenges: Specific projects may be developed to support ILO constituents in the area of AI, jobs, employment and decent work, taking into account the specificities and realities in the different sectors in developing and developed economies

Project 9: Workshop: Can we use Big Data for Skills Anticipation and Matching? (Report "The feasibility of using big data in anticipating and matching skills needs)

New sources of data on skills have potential to provide more current and more specific information on skills needs than is available from the existing sources, and to do so in a cost-effective way. Technological advances, digitalisation and Internet platforms have made it possible to collect very rich and big datasets (“big data”) for many purposes. Data on the content of job advertisements has been collected systematically from online job postings in a range of countries, creating huge datasets

containing detailed information on the requirements advertised. With this idea, the ILO organised last year a workshop featuring presentations given by representatives from partner organisations and academia, in order to discuss the feasibility of using online vacancy big data in the context of skills anticipation and matching. Papers related to the presentations are soon being published in a report entitled "The feasibility of using big data in anticipating and matching skills needs".

- Project Type (Status): Workshop (Closed), Report (Forthcoming)
- Project Domain: Future of Work
- AI Approach: Event, Publication
- Related SDGs: SDG 4 Quality Education, SDG 8 Decent work and Economic growth
- Project Website (links): https://www.ilo.org/skills/events/WCMS_715843/lang--en/index.htm

Project 10: Pilot study - skills needs identification using online job vacancy and job applicants' data

Vacancy data has already shown to have a huge potential as an emerging source for identifying labour market information. The derived analysis empowers governments, employers, workers, and educators to make labour market data-driven decisions, regarding, in particular, the skills requirements of labour markets. While efforts have mainly been concentrated on developed economies, our aim is to develop analytical methods for emerging and developing countries. In collaboration with BuscoJobs International, the largest job search engine in Uruguay, the aim is to allow the ILO's Employment Policy and Research departments to use the job ad data to analyse changes in the task and skills requirements' content of occupations, and thus to look closely at variations and trends in skills requirements. This research will feed into a broader ILO project aiming to draw meaningful conclusions on skills requirements for an occupation(s) across sectors, regions, and countries and over time. With regards to the BuscoJobs data for Uruguay in particular, the main goal is to produce a skills taxonomy based on the information derived from this database, and to use this taxonomy in research revolving around skills dynamics. From this perspective the analysis will be based on the study of job ads, firms characteristics, and applicants characteristics.

- Project Type (Status): Research/Study paper (On-going)
- Domain: Online job vacancy data (BuscoJobs Uruguay)
- AI Approach: Research
- Related SDGs: SDG 8 Decent work and Economic growth
- Partners: BuscoJobs International S.A.

Project 11: Global Employment Trends for Youth 2020: Technology and the future of jobs

The report, published biennially, provides in-depth assessments of the trends and issues in the world of work facing young women and men. The 2020 edition of the report focuses on the impact of technological advances on youth labour markets, finding that young people who are employed face a greater risk than older workers of losing their jobs because of automation, and those with vocational training are particularly vulnerable. It also analyses both opportunities and risks for youth in terms of job destruction and creation, the use of digital technology to improve labour market programmes and sharing productivity gains.

- Project Type (Status): Report (Development)
- Project Domain: Jobs and Employment
- AI Approach: Research
- Datasets: Literature review and research information
- Related SDGs: SDG 4 Quality Education, SDG 8 Decent work and Economic growth

- Project Website (links): https://www.ilo.org/global/publications/books/WCMS_737648/lang--en/index.htm

Project 12: Sectoral meeting on Digitalization and the future of work in the financial services sector

The meeting will discuss challenges and opportunities relating to the impact that digitalization has on decent work in the finance sector. Particular focus will be on global trends, policies, and strategies that can help promote decent work in the sector as well as social and economic development.

- Project Type (Status): Meeting (On-going)
- Project Domain: Financial service
- AI Approach: Research, Tripartite discussion
- Datasets: Literature review, research information and ILOSTAT database
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 16 Peace, Justice and Strong institutions
- Project Partners: ILO constituents- Governments, and Employers and workers organisations
- Project Website (links): https://www.ilo.org/sector/activities/sectoral-meetings/WCMS_748678/lang--en/index.htm
- Challenges: Lack of data on digital occupations in the financial sector.

Project 13: Digital technologies, artificial intelligence, and the transformation of economies

This project investigates how recent advancements in artificial intelligence (AI), the blockchain and other digital technologies impact labour and product markets in developed and developing economies. The project consists of different work streams that are partially overlapping and are strongly interlinked. These work streams are carried out with multiple partners inside and outside the ILO and include: (i) Digitalization, AI and the transformation of jobs; (ii) skills requirements in the digital age: AI as a tool for talent management and labour market efficiency increases on the macro level, (iii) sustainability through AI: trade-offs and complementarity of economic, social and environment dimension, (iv) AI and the transformation of markets: implications for competition law, IP and data privacy.

- Project Type (Status): Research/Study paper (On-going)
- Project Domain: Future of Work
- AI Approach: Research
- Datasets: Various
- Related SDGs: SDG 3 Good Health and Well-being, SDG 8 Decent work and Economic growth, SDG 10 Reduced Inequalities, SDG 11 Sustainable Cities and Communities, SDG 12 Responsible Consumption and Production
- Project Partners: ILO constituents and Universities
- Membership or Secretariat driven: Secretariat-driven
- Technology: Python, STATA

Project 14: Innovative Finance exploration between Social Finance and PARDEV

Phase I research conducted as part of the trilogy studies on safe, fair and sustainable agri-food supply chains in Asia- 'STUDY ON THE FINTECH INNOVATIONS FOR SMALL FARMERS, FISHERFOLKS AND SMEs TOWARDS SAFE, FAIR AND SUSTAINABLE FOOD SUPPLY CHAINS IN SOUTHEAST ASIA' completed; The second phase will look into the champion cases in the Philippines and Vietnam and how Fintech innovations impact small farmers, fisherfolk, and small to medium enterprises (SMEs).

- Project Type (Status): Research/Study paper (Development)

- Project Domain: Financial inclusion and Global Supply Chains, Sustainable and responsible enterprises
- AI Approach: Research, Tripartite-plus dialogue
- Datasets: Fintechs typically tap the database of the user behavior from the mobile apps of the financial service providers or the platformers of e-wallet, e-commerce and ride hailint-cum-food-delivery. Another database being built is the list of mobile assets which can be used as collateral for the supply chain finance.
- Related SDGs: SDG 8 Decent work and Economic growth
- Project Partners: ILO constituents - Governments, and Employers and workers organisation, Fintech sector
- Membership or Secretariat driven: Secretariat-driven on the basis of the growing demand captured through the Future of Work dialogue and other related research
- Technology: Integrated fintech services often delivered through the e-wallet/e-commerce/ride hailing-cum-food delivery platforms. Some uses blockchain platform
- Challenges: Despite the consultants being the well-informed fintech insiders of the Philippines and a senior international financial inclusion advisor, it was difficult for them to fully catch up with the frontiers of the fintech innovation on the digital financial inclusion and provide a balanced picture of the fintech innovations particularly its weakness. Due to an on-going parallel research on the digitalization of wage payment, it has become clear that the AI-enabled alternative credit scoring service providers so far have not succeeded in providing sustainable credit to SMEs in the Philippines, yet. Also, we recently learned that one of the blockchain-based case is enabling the formalization of domestic workers through the mobile banking app. Phase 2 of the study will take these into account together with the accelerated digitalization of the financial services under the covid-19 pandemic to provide more concrete case studies of the fintech innovations and the digital financial inclusion of MSMEs including the informal entrepreneurs and workers.

Project 15: EU-ILO-OECD Responsible Supply Chains in Asia project

Phase I research conducted as part of the trilogy studies on safe, fair and sustainable agri-food supply chains in Asia- 'STUDY ON INNOVATIONS AND CHALLENGES IN DIGITAL TRACEABILITY TOWARDS SAFE, FAIR AND SUSTAINABLE FOOD SUPPLY CHAINS IN ASIA' completed; The second phase will look into the champion cases in the Philippines, Vietnam and Southeast Asia.

- Project Type (Status): Research/Study paper (Minimum viable product)
- Project Domain: Global supply chains, sustainable and responsible enterprises
- AI Approach: Research, Tripartite-plus dialogue
- Datasets: Most of the traceability programmes rely on the internal database of the supply chain lead firms, but some explore the public blockchain-based open database
- Related SDGs: SDG 8 Decent work and Economic growth
- Partners: ILO constituents- Governments, and Employers and workers organisations; Agri-food sector
- Membership or Secretariat driven: Secretariat-driven on the basis of the growing demand captured through the Future of Work dialogue and the policy dialogue under projects.
- Project Website (links): https://www.ilo.org/manila/projects/WCMS_646284/lang--en/index.htm ; https://www.ilo.org/manila/projects/WCMS_717793/lang--en/index.htm
- Technology: Blockchain, optical character recognition (OCR), radio frequency identification (RFID) tags, barcodes, QR codes
- Challenges: Although going beyond the mere proof of concept and many relevant international standards have been prepared (ISO, EU, GS1), many digital traceability systems including blockchain-based ones are progressing slowly and the information is kept internal to the supply chain lead firms. The challenge is compounded since the traceability of the social and

environmental aspects of the global supply chains rely on the private governance by the industry and the third parties (e.g., social auditors, fair trade programmes), and there is no binding international treaty on business and human rights (ILO's MNE Declaration being a pioneer of the voluntary code of conducts in this field). This calls for a partnership with the global headquarters of the champion cases, with the global alliance of the industries exploring the supply chain traceability, and with the global community of business and human rights to make the Phase 2 of the study effective. Another part of the trilogy studies documented comprehensively the mandatory and voluntary requirements of the public and private governance of labour and environmental aspects of the importing and exporting countries, providing a perspective of how the public and private governance of the global supply chains could be leveraged for the enhanced digital traceability of the social and environmental aspects of the global supply chains. International standard of Blockchain/Distributed Ledger Technology is expected in 2021. Phase 2 will take into account the accelerated digitalization of the economy, the need to secure safe workplace under the pandemic, and the "Great Reset" concept towards more safe, fair and sustainable society.

Project 16: Competency Profiling App (funded through the PROSPECTS partnership)

The number of international migrants and refugees is growing rapidly. Between 2000 and 2017, the number increased from 173 million to 258 million (an increase of almost 50%). To reap the benefits of migration, states need to enable migrants and refugees to integrate into the labour market and society through access to employment opportunities. One important factor that prevents this relates to the under-utilization of migrants' and refugees' skills in countries of destination and upon return. It is therefore, vital not only to support governments in adopting policies and legislation that facilitates the access of migrant workers and refugees to the labour market but also to support them in developing and contextualizing technical solutions that may assist them to reduce the strain on public services whilst improving service delivery to the host-population. Therefore, the ILO Skills and Employability Branch is developing and pilot a web-application – for refugees, migrants and host populations in developing countries – that allows individuals to capture and present their past experiences, skills and competences acquired both formally and informally. The multi-lingual and minimal text-typing methodology allows individuals to produce a profile of their skills and competencies summarized in a standardized Curriculum Vitae, and in more detailed occupational competency profiles. Counsellors of employment services, UNHCR, NGOs or other service providers can also assist in filling in and completing the profile.

- Project Type (Status): App (On-going)
- Project Domain: Job and Employment
- AI Approach: Designing and developing an AI-based competency profiling tool in Egypt and Jordan
- Datasets: Individual level data is collected through public employment services in Egypt and Jordan- pilot countries). The European System of Occupational Classifications ESCO, with more than 13.000 skills and 3000 occupations, is utilized as a reference framework for coding / classifying skills. An AI engine learns which skills tend to 'appear in combination' and prompts the right follow-up questions to the user / employment service provider
- Related SDGs: SDG 4 Quality Education, SDG 8 Decent work and Economic growth
- Project Partners: Skilllab (start-up that is developing the app), ABA (Egyptian public employment services)
- Resources/Skills: $50,000 USD

2. Related Sustainable Development Goals (SDGs)

SDGs 3, 4, 8, 9, 10, 11, 12, and 16.

3. Relevant links

www.ilo.org

Contact information

- Ms Irmgard Nübler, Senior Economist (nubler@ilo.org, +41 22 799 8756)

International Maritime Organization

1. Description of Activities on AI

Project 1: Shipping digitalization/cooperation with ports and Maritime Single Window

"Single window" for data, to enable all the information required by public authorities in connection with the arrival, stay and departure of ships, persons and cargo, to be submitted via a single portal, without duplication. In Antigua and Barbuda the window was completed in 2019 and the source code for the system will now be made available to other countries who need it. The single window was created to reduce the administrative burden in the manual exchange of information related to maritime transport

- Project Type (Status): Software product (Deployed)
- Project Domain: Shipping
- AI Approach: Software development
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 9 Industry, Innovation and Infrastructure, SDG 11 Sustainable Cities and Communities, SDG 14 Life below Water
- Project Website (links):
- http://www.imo.org/en/MediaCentre/MeetingSummaries/FAL/Pages/FAL-43rd-Session.aspx; http://www.imo.org/en/MediaCentre/PressBriefings/Pages/07-IMO-maritime-data-solution-available-after-launch-in-Antigua-and-Barbuda-.aspx

Project 2: Maritime Autonomous Surface Ships (MASS)

Set of guidelines for the conduct of MASS trials, stipulating that trials should be conducted in a manner that provides at least the same degree of safety, security and protection of the environment as provided by the relevant instruments

- Project Type (Status): Framework/Strategy/Policy (Development)
- Project Domain: Shipping
- AI Approach: Framework/Strategy/Methodology Formation
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 9 Industry, Innovation and Infrastructure, SDG 11 Sustainable Cities and Communities, SDG 13 Climate Action, SDG 14 Life below Water
- Project Website (links): http://www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-101st-session.aspx

Project 3: E-Navigation

Number of circulars related to e-navigation were approved in 2019 by the 101st session of IMO's Maritime Safety Committee (MSC). E-navigation is defined as "the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means

to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment.

- Project Type (Status): Other (Closed)
- Project Domain: Shipping
- AI Approach: Publication
- Datasets: Marine information on on-board and ashore activities
- Related SDGs: SDG 8 Decent work and Economic growth, SDG 9 Industry, Innovation and Infrastructure
- Project Website (links): www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-101st-session.aspx

Project 4: Marine Environmental Protection and AI

IMO under its Global Industry Alliance (GIA) is working towards promoting Just-In-Time (JIT) arrivals of ships through the use of AIS data and port specific data with an aim to reduce fuel consumption and GHG emissions in ports.

- Project Type (Status): Other (Ideation)
- Project Domain: Marine bio safety
- Datasets: AIS data and Port specific data
- Related SDGs: SDG 3 Good health and Well-being, SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Internal- Global Industry Alliance (GIA)

Project 5: Digital Review

IMO is undertaking a digital review, to ensure a future-viable IMO, as part of a broader Functional Review. The Secretariat aims to ascertain what is working well and what is not working well, what is needed and what is redundant, and to develop a digital strategy and roadmap for the next 5 years to ensure the Secretariat embraces digital opportunities in a way which will make it future viable with regards to digital access.

- Project Type (Status): Framework/Strategy/Policy (Development)
- Project Domain: Internal management
- AI Approach: Digital review
- Related SDGs: SDG 9 Industry, Innovation and Infrastructure, SDG 13 Climate Action, SDG 14 Life below Water, SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnership for the Goals
- Project Partners: Internal- Global Industry Alliance (GIA)

Project 6: Knowledge building

A seminar/workshop to strengthen knowledge of the maritime community/IMO staff, as well as delegates.

- Project Type (Status): Training (Ideation)
- Project Domain: Capacity building
- AI Approach: Events

Project 7: AI for Sustainable Maritime Transport (AI-SMART)

A Possible collaboration with private sector and AI solution providers to enable developing countries to be prepared for AI related solutions in maritime.

- Project Type (Status): Other (Ideation)
- Project Domain: Shipping
- Partners: Possible collaboration with private sectors and AI solution providers

2. Related Sustainable Development Goals (SDGs)

SDGs 3, 8, 9, 11, 13, 14, 16 and 17

3. Relevant links

www.imo.org

Contact information

- Ms Gyorgyi Gurban, Senior Maritime Policy Adviser (ggurban@imo.org, +44 (0)207 4003)

International Organization for Migration

1. Description of Activities on AI

On-going initiatives regarding data science methods (such as artificial intelligence (AI) or machine learning (ML)) within IOM's Displacement Tracking Matrix (DTM) team, have two predominant work streams. The first focuses on developing ethics & guidance through inter-agency collaborations, and the second, as part of DTMs Global Internal Quality Control mechanisms for data management and analysis.

Project 1: Humanitarian Data Science and Ethics group (DSEG)

The group was established to coordinate and collaboratively identify the potential benefits and risks of advanced data science applications for the humanitarian sector and to establish and strengthen existing ethical frameworks and standards behind the use of these methods specific for humanitarian purposes. It encourages responsible data use.

- **Decision Tree**: This decision tree was developed with input from 27 stakeholders, and is a direct translation of the ethical framework. This will be translated into several languages, and is an interactive process for a programme using data science projects to ensure a progressive and innovative approach, is done in a thought out and responsible manner.
  - Project Type (Status): Framework/Strategy/Policy (Development)
  - Project Domain: Data Science and Ethics
  - AI Approach: Framework/Strategy/Methodology Formation
  - Datasets: Existing frameworks on ethics of AI/Machine Learning/Humanitarian data responsibility/Privacy/Protection guidelines
  - Related SDGs: SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
  - Project Partners: Data scientists, Humanitarian program staff & ethic advocates from UN agencies, NGOs, think tanks and academic institutes
  - Project Website (links): https://www.hum-dseg.org/, Decision Tree http://dseg-decisiontree.html-5.me/index.html, Report on Forecasting Human Mobility in Contexts of Crises https://displacement.iom.int/reports/workshop-report-forecasting-human-mobility-contexts-crises?close=true
  - Resources/Skills: A Framework for the Ethical Use of Advanced Data Science Methods in the Humanitarian Sector
  - Contacts: Mr Robert Trigwell, Analytical, Knowledge and Output (AKO) Lead, Global DTM support Team (rtrigwell@iom.int, +44 780 057 9404)

Project 2: Using Collective Intelligence to Reduce analytical bias and introduce local participation in designing humanitarian response in drought-affected displacement contexts

The objective of this project is to utilize the unique insights that affected populations have into their situations and needs in order to pilot an improved aid delivery process. This experiment aims to demonstrate that the use of a collective intelligence approach in humanitarian data analysis can improve aid delivery by reducing the biases both in agency data processing and the participation of affected populations. We further seek to strengthen decision-making related to aid delivery by mitigating biases and process-flaws that result from sectoral or organizational mandates and expanding community representation, buy-in, and empowerment in the process. This experiment represents a proof-of-concept, exploring the impact of applying collective intelligence to DTM processes. If successful, this experiment will contribute towards the improvement of DTM's data and analysis processes and prove the efficacy of CI in humanitarian response.

- Project Type (Status): Development (Development))
- Domain: Improving humanitarian operations
- AI Approach: Machine Learning and Crowdsourcing
- Datasets: Displacement Data (DTM), Rainfall data, humanitarian access data, topographic data, vegetation cover data
- Related SDGs: SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Partners: NESTA
- Contacts: Mr Robert Trigwell, Analytical, Knowledge and Output (AKO) Lead – Global DTM support Team (rtrigwell@iom.int, +44 780 057 9404)

Project 3: Applying techniques for internal quality control within the Displacement Tracking Matrix (DTM) Global Team

DTM Global team Applies AI in Anomaly detection on migration data, and contextualisation of these data using #IDETECT, Rural / urban land classifications of displacement settings from DTMs central data warehouse, quality control routines (based on usual statistics, time-series models, NLP, aerial image recognition, etc.). AI is also applied in analysis of Drone imagery in displacement camps to facilitate a data-driven response to crisis severity measures on living condition in camps during natural disasters.

- Project Type (Status): Software product (Development))
- Project Domain: Quality control
- AI Approach: Machine Learning techniques- Clustering/Classification/Image Recognition/ NLP and Sentiment Analysis
- Datasets: Migration data/Displacement Tracking Matrix (DTM)/Central data warehouse/ Drone imagery
- Related SDGs: SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Challenges: Future works include the use of AI to detect relevant information, including references, figures, populations, and geographical information (among other elements) to recognize material in external documents and platforms that refer to DTM's data or products and to bolster DTM's capacity to cross-check external citations regarding DTM data and products to information and data in DTM's publications,data sets and report drafts in draft documents prior to publication. Using NLP and sentiment analysis for the comments and open-text questions in DTM surveys
- Contacts: Mr Eduardo Zambrano, Data Scientist, DTM Global Support Team (ezambrano@iom .int, +41 22 717 9476)

Project 4: The Big Data for Migration Alliance (BD4M)

The BD4M is the first-ever dedicated network of stakeholders seeking to facilitate responsible data innovation and collaboration to improve the evidence base on migration and human mobility and its use for policy making. Building relationships between governments, international organizations, and civil society to engage in migration policymaking will be key to effectively harnessing data innovation for migration policy. In order to accelerate the creation of new partnerships- data collaboratives- a set of guiding data responsibility principles must be agreed upon and implemented. The BD4M aims to actively address both the need to scale data collaboration and address the ethical challenges associated with using new data sources for migration.

- Project Type (Status): Framework/Strategy/Policy (Development))
- Project Domain: Big Data
- AI Approach: Framework/Strategy/Methodology Formation
- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Project Partners: European Commission Joint Research Centre (JRC) and the Governance Lab at New York University
- Project Website (links): https://data4migration.org/
- Challenges: Future works include the use of AI to detect relevant information, including references, figures, populations, and geographical information (among other elements) to recognize material in external documents and platforms that refer to DTM's data or products and to bolster DTM's capacity to cross-check external citations regarding DTM data and products to information and data in DTM's publications,data sets and report drafts in draft documents prior to publication. Using NLP and sentiment analysis for the comments and open-text questions in DTM surveys
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 5: The Data Innovation Directory - a curated repository of innovative data applications on migration and human mobility

As part of the Big Data for Migration Alliance (BD4M), IOM's Global Migration Data Analysis Centre (GMDAC)has developed a user-friendly, searchable curated repository of data innovation projects and initiatives in the area of migration and human mobility, including information about the project objectives, lead and partner organizations, focus topics, data sources, SDG or GCM objectives targeted, results to date, and links to further information, among others.

- Project Type (Status): Software product (Development))
- Project Domain: Big Data
- AI Approach: Software development
- Datasets: Big data projects on human migration
- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Project Website (links): https://migrationdataportal.org/data-innovation
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 6: Ten key policy questions related to migration, whose answers can be found in data and data science

Identification of ten key policy questions related to migration, whose answers can be found in data and data science. This is part of the wider "100 Questions Initiative" by the GovLab. The ten key questions

on migration will be sourced by leveraging a community of "bilinguals" – practitioners across sectors globally who possess both migration and data expertise. The policy questions are meant to address the demand for data innovation.

- Project Type (Status): Framework/Strategy/Policy (Development))
- Project Domain: Human Migration
- AI Approach: Framework/Strategy/Methodology Formation
- Datasets: Big data projects on human migration
- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Project Partners: The Governance Lab at New York University (GovLab) , Data2X, European Commission Joint Research Centre (JRC)
- Project Website (links): https://migration.the100questions.org/
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 7: How Facebook Network data can contribute to identifying trends in migrant stocks in selected countries

An analysis of how Facebook data can contribute to identifying trends in migrant stocks in selected countries. It was triggered by the need to draw valuable insights from the vast amounts of data on human mobility resulting from exponential growth in the use of digital devices and internet services around the world.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Human Migration
- AI Approach: Research
- Datasets: Facebook data
- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Partners: Max Planck Institute for Demographic Research, Qatar Computing Research Institute, European Commission Joint Research Centre (JRC)
- Project Website (links): https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0224134&type=printable
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 8: Analysis of Twitter data to measure anti-migrant sentiment during COVID-19

The proposed pilot project aims to measure and monitor changes in attitudes towards immigrants during the current COVID-19 outbreak using Twitter data and machine learning. Specifically this project seeks to a) Identify the key discrimination and racism acts and experiences undergone by immigrants in five countries: the United States, the United Kingdom, Spain, Italy and Germany; b) determine the extent of intensification in anti-immigration sentiment as the geographical spread and fatality rate of COVID-19 increases; and, c) assess how the key challenges, acts of discrimination and racism experienced by migrants vary by country.

- Project Type (Status): Research/Study paper (Development)
- Project Domain: Big Data
- AI Approach: Research
- Datasets: Twitter data

- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Project Partners: University of Liverpool
- Project Website (links): https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0224134&type=printable
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 9: Analysis of Google Trends data to create forecasting tool for migration flows

The proposed pilot project aims to explore Google Trends data in order to develop a tool for policy makers to monitor in migration-relevant online searches and anticipate migration flows between countries and regions.

- Project Type (Status): Research/Study paper (Development)
- Project Domain: Big Data
- AI Approach: Research
- Datasets: Google trends and Facebook data
- Related SDGs: SDG 7 Affordable and Clean energy, SDG 10 Reduced inequalities, SDG 17 Partnership for the Goals
- Challenges: Turning preliminary research findings into a practical tool for policy-makers while taking account of the uncertainty in the models
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 10: Global Migration Data Analysis Centre - Strengthening national capacities to harness big data and novel methods for migration policy

IOM is proposing a programme to build national capacities in selected low- and middle-income countries to leverage new data sources, such as data from mobile phones, social media and satellite imagery, as well as new methods combining traditional and new sources, in migration analysis for policy.

- Project Type (Status): Other (Ideation)
- Project Domain: Capacity building
- Partners: Flowminder Foundation, The WorldPop at the University of Southampton, The UN Population Fund, and National counterparts
- Challenges: Challenges faced include lack of funding to formalize the discussion group, access to data due to privacy and security concerns, fragmentation of information and selection inherent from use of big data sources. Future works comprise raising of awareness and knowledge sharing on big data applications with related partners, building a network of practitioners and experts across sectors who are interested in harnessing the potential of new data sources and innovative methodologies to improve understanding of migration and human mobility and enhancing capacities to utilize new data sources and innovative methods in low and middle income countries.
- Contacts: Ms Marzia Rango, Research and Data Officer (mrango@iom.int, +49 171 547 9280)

Project 11: Research project collaboration to assess the Diagnostic accuracy of computer-aided detection solutions to identify pulmonary tuberculosis on Chest x-rays of TB screening cases

IOM and FIND entered a research collaboration in 2017 to conduct two parallel studies at the respective organizations to evaluate the accuracy of the AI solutions for the screening of suspected TB cases, after decision to have more information was made by WHO expertise meeting in 2016. The aim of the research project is to conduct AI evaluations independent of the developers using a similar

study design and analysis plan, but with separate databases of CXR DICOM images with corresponding clinical and demographic data from individuals who underwent screening, and inform the result to WHO for guiding the WHO recommendation of using AIs for national TB Programs. The study at IOM assesses the accuracy of the AIs on HA of migrant bound to US, using sample of CXR DICOM images done during the health assessment and the retrospective clinical data. The study was conducted after getting approval from IOM Legal counsel and CDC, received ethical clearance from McGill University, and signed IOM legal agreements with FIND and all the three AI companies.

- Project Type (Status): Research/Study paper (On-going)
- Project Domain: Radiology, AI, and TB screening of Migrants
- AI Approach: Research
- Datasets: IOM MHD Health assessment clinical Data and anonymized DICOM chest X-ray images
- Related SDGs: SDG 3 Good Health and Well-being
- Partners: Foundation for Innovative New Diagnostics (FIND), Geneva, Switzerland
- Resources/Skills: IOM Teleradiology Radiologists, Teleradiology Technical team, and data analysis assistant
- Technology: Three AIs installed in the local servers, and extracted data from IOM Migrant health recording systems and the DICOM chest x-ray images from the local picture archiving and communication systems (PACS)
- Challenges: Main challenges were funding, coordination and technical establishment of the archives, and the length of time to finalize the legal documents and approval processes.
- The first result of the project was completed last month, the report submitted to WHO, and the ppt presentation presented to the WHO TB guideline development group meeting conducted on 02 Jul 2020. Based on the feedback expected from WHO, there is a plan to conduct further studies on the new versions of the AIs as needed and answer more unanswered study question.
- Contacts: Dr. Sifrash Meseret Gelaw, Global Radiology Coordinator, IOM Global Radiology and QC Center, MHD, MAC, Manila, Philippines (sgelaw@iom.int, +6382301674, +639178634703)

Project 12: Early and Improved Tuberculosis case detection and treatment among migrants and their families in provinces 1, 2 and 3 of Nepal through Public Private Mix Approach

IOM Nepal under the TB REACH project is planning to conduct an operational research to assess the impact of Artificial Intelligence on early and improved detection of Tuberculosis in Nepal. This is already discussed and agreed by the NTCC. For this operational research, the Qure.ai has provided in-kind support with 30,000 reading and 3 Qure.ai box (equivalent to $50,000) and will be linked with the three digital X-ray of National TB Center service sites where F.A.S.T. strategy is already introduced. Currently, the ITC global is reviewing the agreement with Qure.ai at technical level and we are hoping that it will be completed very soon. Meanwhile, we are also trying to have a meeting with the NTCC Director and his team to add COVID19 testing in the operational research as well. The findings of the study will be published in the peer-reviewed journal.

- Project Type (Status): Research/Study paper, Journal (On-going)
- Project Domain: Radiology, AI, and TB screening of Migrants
- AI Approach: Research
- Related SDGs: SDG 3 Good Health and Well-being
- Project Partners: Stop TB Partnership, Qure.ai
- Resources/Skills: National TB Center service sites; Radiologist; IOM IT staff; TB Reach Staff of IOM
- Technology: Three Qure.ai box will be installed with the National TB Center service sites, anonymized CXR images will be sent for the deep learning and interpretation and interpreted locally.

- Challenges: Initially the operational research was planned in the health assessment centers for foreign employment in Nepal but due to the COVID19 pandemic we had to revise the entire strategy, now discussed with National TB Center and introducing this soon after the internal approval from LEG and ITC global.
- Contacts: Dr Radheshyam Krishna KC, Migration Health Officer (rkkc@iom.int)

2. Related Sustainable Development Goals (SDGs)

SDGs 3, 7, 10, and 17

3. Relevant links

www.iom.int

Contact information

- Ms Nuno Nunes, Global DTM Coordinator (nnunes@iom.int, +41 79 433 5878)

International Telecommunication Union

1. Description of Activities on AI

Project 1: The AI for Good Global Summit

The AI for Good Global Summit series identifies practical applications of AI with the potential to accelerate progress towards the United Nations' Sustainable Development Goals. Close to 40 UN organizations are partners of the AI for Good Global Summit. Now in its fourth edition, this year's AI for Good Global Summit is being held online all year, and will continue to connect AI innovators with public and private-sector decision-makers in the interests of stimulating the discovery and delivery of "AI for Good" solutions for all. The "digital bouquet of flowers" has been arranged into three streams (Build, Learn, Experience) with the following service offerings:

BUILD	LEARN	EXPRIENCE
– AI for Good Breakthroughs – AI for Good Innovation Factory – AI for Good Machine Learning 5G Challenge – AI for Good Repository	– AI for Good Keynotes – AI for Good Webinars – AI for Good Perspectives – AI for Good On the Go!	– AI for Good Artistic Intelligence – AI for Good Demos

These service offerings are available for all UN partners to play an active role in moving the needle towards achieving the Sustainable Development Goals.

- Project Type (Status): Event (Recurring event)
- Project Domain: Artificial Intelligent
- AI Approach: Events, Platforms
- Project Partners: 38 UN agencies and bodies
- Project Website (links): https://aiforgood.itu.int/
- Contacts: Mr Reinhard Scholl (reinhard.scholl@itu.int, +41 22 730 5860); Mr Frederic Werner (frederic.werner@itu.int; +41 22 730 5572)

Project 2: Compendium of UN Activities on Artificial Intelligence

Since 2018, ITU has issued the "Compendium of UN Activities on Artificial Intelligence", aiming to introduce activities being carried out by the UN system. A joint-effort between ITU and 37 UN agencies and bodies, all partners of the 2020 AI for Good Global Summit, the 2019 report on "UN Activities on Artificial Intelligence" has been updated. The 2020 version of the report includes the collection of activity report from 36 UN agencies, providing details on UN agencies experiments with AI to improve their response to global challenges. This year, the Compendium will be more extensive, by

including additional details (e.g. identifying AI tools and datasets used) and will be tagging to form an AI capability catalogue.

- Project Type (Status): Data discovery (Research/study paper)
- Project Domain: AI projects and best practices
- Project Partners: 37 UN agencies and bodies
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): 2018 Compendium https://www.itu.int/dms_pub/itu-s/opb/gen/S-GEN-UNACT-2018-1-PDF-E.pdf, 2019 Compendium https://www.itu.int/dms_pub/itu-s/opb/gen/S-GEN-UNACT-2019-1-PDF-E.pdf
- Contacts: Ms JeoungHee Kim, ICT Analyst (jeounghee.kim@itu.int, +41 22 730 5360)

Project 3: Focus Group on Artificial Intelligence for Health (FG-AI4H)

The ITU-WHO Focus Group on Artificial Intelligence for Health (FG-AI4H), driven in close collaboration by ITU and WHO, is working towards the establishment of a framework and associated processes for the performance benchmarking of 'AI for Health' algorithms. The group is currently working on 20 topic areas ("use cases") addressing health issues including breast cancer, neurodegenerative diseases, autism, vision loss, skin lesions, cardiovascular diseases, and venomous snakebites. A summary of the current status of the work was published in The Lancet- "WHO and ITU establish benchmarking process for artificial intelligence in health"- a weekly peer-reviewed general medical journal which is among the world's oldest, most prestigious and best known general medical journals.

- Project Type (Status): Other (Other)
- Project Domain: Health
- AI Approach: Framework/Strategy/Methodology Formation
- Project Partners: WHO
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx, https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30762-7/fulltext?dgcid=raven_jbs_etoc_email_x000D_
- Contacts: Mr Simao Campos (simao.campos@itu.int; +41 22 730 6805), Mr Bastiaan Quast (bastiaan.quast@itu.int; +41 22 730 6201)

Project 4: Machine Learning for Future Networks including 5G

AI / ML (machine learning) will shape how communication networks, a lifeline of our society, will be run. Many companies in the ICT sector are exploring how to make best use of AI/ML in their networks in order to optimize network operations, increase energy efficiency and curtail the costs of operating a network. ITU has been at the forefront of this endeavour exploring how to best apply AI/ML in future networks including 5G networks. ITU has been at the forefront developing standards adddressing Machine Learning's contribution to communication networks. Leading this effort has been the ITU Focus Group on Machine Learning for Future Networks including 5G (FG-ML5G) which has concluded a Machine Learning toolset for communication networks comprising ten technical specifications, including interfaces, network architectures, protocols, algorithms and data formats. About half of these specifications have already been turned into ITU standards ("ITU Recommendations"), with the rest following. The key standard of this toolset – ITU Y.3172 – describes an architectural framework for networks to accommodate current as well as future use cases of Machine Learning.

Building on its standards work, ITU is conducting a global ITU AI/ML 5G Challenge throughout 2020 on the theme of how to apply ITU's ML architecture in networking including 5G networks. Over 500 profesisionals and students from over 50 countries have signed up for this competition. Participants

are solving real world problems, based on standardized technologies developed for ML in 5G networks. Teams are required to enable, create, train and deploy ML models such that participants will acquire hands-on experience in AI/ML in areas relevant to communication networks. The Challenge will culminate in the Grand Challenge Finale, an online event taking place from 15 to 17 December 2020 (https://www.itu.int/en/ITU-T/AI/challenge/2020/Pages/default.aspx).

- Project Type (Status): Other (Other)
- Project Domain: Communication
- AI Approach: Framework/Strategy/Methodology Formation
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.itu.int/en/ITU-T/focusgroups/ml5g/Pages/default.aspx; https://www.itu.int/en/ITU-T/AI/challenge/2020/Pages/default.aspx; ITU NEWS story: https://news.itu.int/new-itu-standard-machine-learning-5g-networks/
- Contacts: Mr Reinhard Scholl (reinhard.scholl@itu.int, +41 22 730 5860)

Project 5: AI in radiocommunications

AI could be used during the process of making and distributing television and radio content. It is now being used to optimise workflows for broadcasting programme making, to improve audio and visual quality evaluation, to efficiently utilize the frequency spectrum in television and radio distribution and recently even to create new programmes by mining archives as well as automatically targeting content to specific audiences or individuals.

For example, AI is being used for extracting content from vast archives; automatically localising content for international distribution; and generating access services such as captioning, audio description, text to speech and signing far faster and far more accurately than could be achieved in the past.

ITU has studied artificial intelligence systems for programme production and exchange for which a report is published (Report ITU-R BT.2447).

- Project Type (Status): Other (Other)
- Project Domain: Communication
- AI Approach: Framework/Strategy/Methodology Formation
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.itu.int/en/action/ai/emerging-radio-technologies/Pages/default.aspx
- Contacts: Mr Ruoting Chang (ruoting.chang@itu.int, +41 22 730 6136)

Project 6: Focus Group on AI for autonomous and assisted driving (FG-AI4AD)

The ITU Focus Group on AI for autonomous and assisted driving (FG-AI4AD) supports standardization activities for services and applications enabled by AI systems in autonomous and assisted driving. FG-AI4AD studies the behavioural evaluation of AI (when it is responsible for the dynamic driving task of a vehicle), in accordance with the 1949 and 1968 Convention on Road Traffic of the UNECE Global Forum for Road Safety.

To build public trust it is fundamental that the performance of AI on our road meets, or exceeds, the performance of a competent and careful human driver. The FG aims to create international harmonisation on the definition of a minimal performance threshold for these AI systems (such as AI as a Driver). This work has the potential to facilitate adoption of AI on our roads and aims to reducing road injuries, which are already the leading cause of death for children and young adults aged 5–29 years (more so than HIV and tuberculosis). In fact, AI can play a significant role to reduce 1.3 million road deaths and 25 million injuries (SDG 3.6) occurring each year, whilst also encouraging

safe, affordable, accessible and sustainable transport systems (SDG 11.2). However, the widespread and socially acceptable deployment of AI on our roads is dependent upon technology achieving public trust. The Focus Group is quickly raising attention from public and private entities and is becoming a popular forum for discussion. Expected outcomes are:

- "Automated driving safety data protocol – Specification"
- "Automated driving safety data protocol – Public safety benefits of continual monitoring"
- "Automated driving safety data protocol – Practical demonstrators"

The Focus Group is also pioneering the discussion on what is referred to by "The Molly Problem". Participation is open; there are no membership requirements.

- Project Type (Status): Other (Other)
- Project Domain: Vehicles
- AI Approach: Framework/Strategy/Methodology Formation
- Project Partners: UNECE
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx
- Contacts: Mr Stefan Polidori (stefano.polidori@itu.int; +41 22 730 5858)

Project 7: Focus Group on Environmental Efficiency for AI and other Emerging Technologies (FG AI4EE)

The ITU Focus Group on Environmental Efficiency for AI and other Emerging Technologies (FG AI4EE) is studying environmental efficiency in the age of AI, increasing automation, and smart manufacturing. The Focus Group aims to provide guidance on the environmentally efficient operation of emerging technologies, as well as the influence of these technologies on the environmental efficiency of the broader ICT ecosystem. The group's work also supports ITU's ongoing studies of the environmental requirements of IMT-2020 (5G) systems. FG-AI4EE is working on over 20 deliverables which cover topics related to requirements, assessment, measurement and implementation guidelines of the environmental efficiency of AI and other emerging technologies. Participation is open; there are no membership requirements.

- Project Type (Status): Other (Other)
- Project Domain: Environment
- AI Approach: Framework/Strategy/Methodology Formation
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/default.aspx
- Contacts: Ms Charlyne Restivo, (charlyne.restivo@itu.int, +41 22 730 5861)

Project 8: Global Initiative on AI and Data Commons

The Global Initiative on AI and Data Commons is a program and collaborative platform to support the implementation of beneficial AI based solutions to accelerate progress towards the 2030 Sustainable Development Goals. A Roundtable on the Global Initiative on AI and Data Commons was convened at ITU headquarters on 30-31 January 2020, attended by around 100 participants (including AI specialists, data owners, and infrastructure providers from the private sector, academia, governments, UN agencies and standards bodies). The roundtable highlighted the need for the Global Initiative to maximize collaboration in order to:

- Match problem owners with providers of solutions using AI and data;
- Scale and sustain AI-based projects;

- Make available and accessible capabilities, resources, datasets, know-how, guidelines, frameworks, standards as a common good.

At the roundtable, two working groups (on repositories and on marketplaces) were established and one project was identified (Global AI services platform, initially introduced at an AI for Good Global Summit) to progress toward achieving the mission of the Global Initiative, summarized here. On 16 July 2020, as part of the AI for Good Webinar series, the Global Initiative launched the Global Data Pledge project to help identify, support and make available data as a common global resource.

– Project Type (Status): Other (Other)
– AI Approach: Framework/Strategy/Methodology Formation
– Membership or Secretariat-driven: Membership-driven
– Contacts: Mr Martin Adolph (martin.adolph@itu.int; +41 22 730 6828)

Project 9: The World Telecommunication/ICT Policy Forum (WTPF)

ITU will hold the sixth World Telecommunication/ICT Policy Forum (WTPF) in 2022, intended to help create a shared vision among policymakers on the issues arising from the emergence of new telecommunication/ICT services and technologies. The outcomes of the WTPF are non-binding Opinions agreed by multistakeholder consensus. The theme for WTPF-21 is "Policies for mobilizing new and emerging telecommunications/ICTs for sustainable development" and that the WTPF-21 would discuss how new and emerging digital technologies and trends are enablers of the global transition to the digital economy. Themes for consideration would include AI, IoT, 5G, Big Data, OTTs etc. and focus on opportunities, challenges and policies to foster sustainable development." A multistakeholder informal expert group currently leads the 2-year preparatory process towards the sixth WTPF.

– Project Type (Status): Event (Recurring event) preceded by a membership-driven expert group-led preparatory process
– Public Domain: Emerging Technologies/ICTs
– AI Approach: Multistakeholder agreement on Consensus Policy Opinions
– Project Partners: Process open to all stakeholders (governments, private sector, technical community, civil society, IGOs, Academia)
– Membership or Secretariat-driven: Membership-driven
– Project Website (links): https://www.itu.int/en/wtpf-21/Pages/default.aspx
– Contact: Mr Preetam Maloor, Head, Emerging Technologies Division (preetam.maloor@itu.int, + 41 22 730 5417)

Project 10: Supporting the UN Chief Executives Board for Coordination (CEB)

The UN CEB approved a "UN system-wide strategic approach and roadmap for supporting capacity development on artificial intelligence"- especially for developing countries, with particular emphasis on the bottom billion. ITU led the coordination of the strategic approach. ITU is currently leading the effort to map AI capacity-building efforts within the UN system, identify further gaps, and actions to be prioritized and addressed for the purpose of furthering the implementation of the Strategic Approach.

– Project Type (Status): Framework/Strategy/Policy (Development)
– Public Domain: Capacity Building
– AI Approach: Events/Strategy formulation for capacity building on AI majorly in developing countries
– Project Partners: UN System
– Membership or Secretariat-driven: Secretariat-driven (UN Chief Executives Board for Coordination (CEB)/High Level Committee on Programmes)

- Project Website (links): https://digitallibrary.un.org/record/3811676?ln=en
- Contacts: Mr Preetam Maloor, Head, Emerging Technologies Division (preetam.maloor@itu.int, + 41 22 730 5417)

Project 11: AI for Good Repository

The AI Repository collects, and reports on, either planned or carried out AI activities and projects by governments, international organizations, the business sector, civil society, academia and other entities. The AI Repository contributes to achieving the UN SDGs by categorizing and matching these projects to the respective 17 SDGs.

- Project Type (Status): AI projects & idea (Development)
- Project Domain: Global projects on Artificial intelligence
- AI Approach: Repository
- Project Partners: Process open to all stakeholders (governments, private sector, technical community, civil society, IGOs, Academia, etc.)
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.itu.int/en/ITU-T/AI/Pages/ai-repository.aspx
- Contacts: Mr Jinu Um (jinu.um@itu.int, +41 22 730 5808)

Project 12: Interregional Emerging Technology for Development Week

The objective of the event is to promote the wide scale deployment of emerging technologies including, Artificial Intelligence, IoT, Big Data, low orbiting satellites, and 5G to ultimately contribute to the achievement of the Sustainable Development Goals. This event is planned to take place annually with a new theme each year focusing on specific emerging technologies and targeting a few SDGs. This year the focus will be on SDG 3 on Health and Well Being, SDG 8 on Decent Work and Economic Growth and SDG 9 on Industry, Innovation and Infrastructure. The rational is that due to the COVID-19 crisis a global recession has occurred that will have a negative impact on the global economy at large and developing countries. In addition, as economies are planning the new normal, investments will be made in emerging technologies. This event will be an opportunity to shed light on the different country experiences relevant to utilizing emerging technologies to combat the socio-economic impact of COVID-19. In addition, the event includes an interregional innovation challenge on artificial intelligence for tackling the socio-economic impact of COVID-19.

- Project Type (Status): Event (Recurring event)
- Project Domain: Emerging Technologies
- AI Approach: Capacity Building, Challenge
- Contacts: Aminata A. Garba (aminata.amadou-garba@itu.int, +41 22 730 5720)

2. Related Sustainable Development Goals

All SDGs

Contact Information

- Mr Preetam Maloor, Head of Emerging Technologies Division (Preetam.maloor@itu.int,+41 22 730 5417)

UNITED NATIONS
UNCTAD

United Nations Conference on Trade and Development

1. Description of Activities on AI

UNCTAD, through its Division on Technology and Logistics (DTL), aims to enhance the economic development and competitiveness in developing countries- in particular Least Developed Countries- through science, technology and innovation, including in the use, adoption, adaptation, dissemination and development of frontier technologies such as AI.

Project 1: United Nations Commission on Science and Technology for Development (CSTD)

UNCTAD is the secretariat of the CSTD, a functional commission of ECOSOC. The CSTD is the focal point within the United Nations for science, technology and innovation (STI) for development. As such, it plays a central role in analysing how STI, including frontier technologies such as AI, serve as enablers of the 2030 Agenda. In 2020, one of the two priority themes considered by the CSTD was "Harnessing rapid technological change for inclusive and sustainable development," and the CSTD recognized that rapid technological change, including in AI, can accelerate the implementation of the 2030 Agenda by providing new solutions to economic, social and environmental obstacles. At the same time, it poses considerable challenges for legal, social, and cultural norms regarding issues ranging from the integrity of human life to privacy, security, and the prevention of new forms of discrimination. The CSTD has highlighted the role of appropriate science, technology and innovation policies that provide directionality to rapid technological change through a supportive enabling environment, skills development to foster innovation, with an emphasis on carefully scaling up businesses and technological foresight.

- Project Type (Status): Other (Other)
- Project Domain: Science, Technology and Innovation
- AI Approach: Analysis of STI as enablers of 2030 agenda, intergovernmental platform
- Project Partners: UN System
- Membership or Secretariat-driven: Membership-driven

Project 2: Technology and Innovation Report (TIR)

UNCTAD's flagship Technology and Innovation Report (TIR) address issues in science, technology and innovation that are topical and important for developing countries in a comprehensive way with an emphasis on policy-relevant analysis and conclusions. Technology and Innovation Report 2018 addressed the of harnessing frontier technologies for sustainable development, which included AI and other technologies such as Big data, Internet of Things, 3D Printing, Biotech, Nanotech, Renewable Energy, Drones, and Satellites. The Technology and Innovation Report 2020 critically examines the possibility of frontier technologies such as AI widening existing inequalities and creating new ones. It extends the usual treatment given to this topic beyond the context of developed countries and

also analyzes the potential effect of rapid technological change on developing and least developed countries, as well as on the most vulnerable segments of societies.

- Project Type (Status): Other (Other)
- Project Domain: Science, Technology and Innovation
- AI Approach: Publication
- Project Partners: UN System
- Membership or Secretariat-driven: Membership-driven

Project 3: Interagency coordination on STI for SDGs

UNCTAD co-leads together with DESA the UN interagency task team on STI for the SDGs, which is part of the Technology Facilitation Mechanism of the Agenda 2030. The interagency task prepares the Multistakeholder STI Forum, which has discussed the impact of key rapid technological changes on the achievement of the Sustainable Development Goals. Common to these activities is the continuous broad discussion with the involvement of all stakeholders on the impacts of new technologies and the need for technical assessments of these impacts that systematically use models, scenarios and foresight exercises to make clear the assumptions and the most relevant policy areas when considering the impact of these technologies.

- Project Type (Status): Other (Other)
- Project Domain: Science, Technology and Innovation
- AI Approach: Forum
- Project Partners: DESA, IATT
- Membership or Secretariat-driven: Membership-driven

2. Related Sustainable Development Goals

All SDGs

3. Relevant links

- Technology and Innovation Report 2018: Harnessing Frontier Technologies for Sustainable: Development http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2110
- Commission on Science and Technology for Development, twenty-third session [virtual informal meeting]: https://unctad.org/en/pages/MeetingDetails.aspx?meetingid=2239
- STI Forum 2020: https://sustainabledevelopment.un.org/TFM/STIForum2020

Contact Information

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- Mr. Clovis Freire, Economic Affairs Officer (freire@un.org, +41 22 917 7916)

UNDESA

United Nations Department of Economic and Social Affairs

1. Description of Activities on AI

Project 1: Fast-evolving technologies in e-government: Government Platforms, Artificial Intelligence and people

Chapter8 within the United Nations E-Government Survey 2018 discusses transformative technologies, such as data analytics, Artificial Intelligence including cognitive analytics, robotics, bots, high-performance and quantum computing. It explains how forces driving such technologies are the result of long-term and painstaking research and development, their use by businesses and citizens as well as the increased processing power of hardware, increasing data availability and society's driving needs and expectations.

- Project Type (Status): Other (Other)
- Project Domain: Towards Data-Centric E-Government" of the UN E-Government Survey 2020
- AI Approach: Publication
- Related SDGs: All SDGs, specifically SDG 16 Peace, Justice and Strong Institutions
- Membership or Secretariat-driven: Both
- Project Website (links): https://publicadministration.un.org/egovkb; https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf
- Resources/Skills: The need for data is nothing new but the ways in which data are created and used have changed dramatically in recent years, bolstered by the revolution in data technologies and the proliferation of applications of different types and forms of data, including small and big data, real-time data and geospatial data. The current COVID-19 pandemic also reinforces the centrality of data-- how governments and businesses handle data, as it turns out, is a crucial part of their pandemic response. Learn more about open government data development, policy and institutional trends on government data sharing, exchange and interoperability, as well as data security, privacy and ethics; and recommendations on national data leadership and data governance framework.
- Technology: Publication
- Challenges: Developing indicators to measure how AI is used in public administration
- Contacts: Mr Deniz Susar, Governance and Public Administration Officer (susar@un.org, +1 212 963 8421)

Project 2: Artificial Intelligence opportunities and challenges for the public Sector

Conference paper to the recent ICEGOV 2019 on AI opportunities and challenges for the Public Sector

- Project Type (Status): Study paper (Closed)

- Project Domain: Towards Data-Centric E-Government" of the UN E-Government Survey 2020
- Related SDGs: All SDGs, specifically SDG 16 Peace, Justice and Strong Institutions
- Contacts: Mr Deniz Susar, Governance and Public Administration Officer (susar@un.org, +1 212 963 8421)

Project 3: TFM findings on the impacts of rapid technological change on the SDGs

New and rapidly changing technologies, such as artificial intelligence, robotics and other automation technologies hold great promise for making accelerated progress towards the Sustainable Development Goals, but also pose formidable challenges in all of the SDG dimensions. Against this background, the UN General Assembly has called upon the TFM in repeated resolutions to present their updated findings to the Annual Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs.

- Project Type (Status): Research/Study paper (Recurring event)
- Project Domain: New technologies, including AI
- AI Approach/Activity: Findings are crowdsourced from TFM partners and scientific and technological communities, through calls for inputs (policy briefs and research papers), leveraging institutional networks, university partnerships and meetings. In particular, a series of UN expert group meetings on AI since 2016 have provided a convergent series of general policy recommendations, upon which recommendations for specific issues elaborate.
- Datasets: Scientific data provided by contributors and volunteers. Database under development
- Related SDGs: SDG 17 Partnerships for the Goals
- Project Partners: DESA, IATT, 10-Member Group, TFM partners, Universities
- Project Website (links): https://sustainabledevelopment.un.org/tfm
- Resources/Skills: Mainly volunteer work; knowledge of technologies developments, sustainable development models and pathways.
- Technology: UN platform
- Challenges: Key challenges have been the vast scope of the exercise, limited resources, and large expectations. However, a series of lessons-learnt have been identified and important support provided to various reports. Present work in 2020 focuses on the environmental impacts of AI.
- Contacts: Mr Richard A Roehrl, Senior Economic Affairs Officer (roehrl@un.org)

Project 4: Exploring the impacts of new Internet applications and AI on the global energy system

New Internet applications and especially AI technologies have become a rapidly increasing source of energy demand but have also greatly shaped the opportunities for smart and cleaner energy systems. This project reviews what is known and what might be potential policy responses to these trends in the future.

- Project Type (Status): Research/Study paper (Ongoing)
- Project Domain: AI and Energy
- AI Approach/Activity: Desk study and expert surveys
- Datasets: (Under development)
- Related SDGs: SDG 7 Affordable and Clean Energy, SDG 9 Industry, Innovation and Infrastructure, SDG 17 Partnerships for the Goals
- Project Partners: DESA, IATT, 10-Member Group, Other experts
- Project Website (links): https://sustainabledevelopment.un.org/tfm
- Resources/Skills: Expert knowledge, volunteer work, and scientific networking skills.

- Challenges: A key challenge has been the identification of work that exists in fragmented forms in various disciplines and both in academia and private sector. Hence, interdisciplinary expert surveys are key to their identification. Furthermore, a common technical terminology is needed.
- Contacts: Mr Richard A Roehrl, Senior Economic Affairs Officer (roehrl@un.org)

Project 5: IEEE/UN Event series

Training and outreach event on technology, policy, ethics and engagement of AI and other new technologies.

- Project Type (Status): Event (Concept note)
- Project Domain: New technologies, including AI: technology, policy, ethics and engagement
- AI Approach/Activity: Webinar series
- Datasets: IEEE datasets
- Related SDGs: SDG 17 Partnerships for the Goals
- Project Partners: DESA, IEEE, TFM partners
- Resources/Skills: Expert knowledge.
- Contacts: Mr Richard A Roehrl, Senior Economic Affairs Officer (roehrl@un.org)

Project 6: Long-term AI and technology scenarios for the SDGs

Long-term technology scenarios are routinely used to explore feasible technology pathways to tackle big global challenges, such as climate change and biodiversity. While an increasing number of them assume significant new opportunities due to AI, most of them do not make any effort to quantify these effects in both positive and negative terms. This initiative aims to explicitly account for AI and potential future AI technology developments based on existing technology development data. It also provides inputs for the mandated discussions of long-term future scenarios and the impact of current trends in the high-level segment of ECOSOC each year.

- Project Type (Status): Research/Study paper (Recurring event)
- Project Domain: AI scenarios
- AI Approach/Activity: Scenario analysis
- Datasets: Various scientific and technological data sources
- Related SDGs: SDG 7 Affordable and Clean Energy, SDG 13 Climate Action, 17 Partnerships for the Goals
- Project Partners: DESA, TFM partners
- Project Website (links): https://undocs.org/e/2020/60
- Resources/Skills: Scenario analysis, technology change, AI techs
- Technology: Various scenario models
- Challenges: A challenge is the linking to the national level and national level AI scenarios (where they exist)
- Contacts: Mr Richard A Roehrl, Senior Economic Affairs Officer (roehrl@un.org)

Project 7: Guidebook on AI ethics for government and development practitioners

While there are hundreds of publications and proposed AI ethics frameworks and codes of conduct by scientific and engineering communities, as well as an UNESCO initiative on AI ethics, little practical

guidance exists for governments and development practitioners, especially guidance that is fully based on a balanced scientific and technological understanding. The guidebook aims to fill this gap.

- Project Type (Status): Report (Ongoing)
- Project Domain: AI ethics
- AI Approach/Activity: Collaborative product developed by academics working on AI ethics with practical experience
- Related SDGs: SDG 9 Affordable and Clean Energy, SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: DESA, TFM partners
- Challenges: A key challenge is the translation of technical specificities into practical, easy understandable guidance for practitioners.
- Contacts: Mr Richard A Roehrl, Senior Economic Affairs Officer (roehrl@un.org)

Project 8: TFM online platform

The TFM online platform was mandated to provide a single-entry point for technology information.

- Project Type (Status): Software project (Deployed)
- Project Domain: Online platform for information on technologies and SDG knowledge
- AI Approach/Activity: Gateway to networks of curated SDG-related technologies and knowledge from UN and non-UN resources
- Related SDGs: All SDGs
- Project Partners: DESA, OICT, UNCTAD, 10-Member Group, and an increasing number of other partners (see website)
- Project Website (links): https://tfm2030connect.un.org/
- Challenges: Further development of content and operational support work.
- Contacts: Ms Stephanie Rambler, Sustainable Development Officer (rambler@un.org)

Project 9: Guidebook to resources on AI strategies (supplement to the IATT Guidebook on STI roadmaps for the SDGs)

While there is an increasing number of AI strategies and an exponentially increasing number of publications on AI, government officials and development practitioners alike could benefit from a trusted, curated and annotated list of written resources on the various aspects of AI.

- Project Type (Status): Report (Ongoing)
- Project Domain: Curated listing of AI publications
- AI Approach/Activity: Curated and annotated list of publications on the various aspects of AI, in support of STI roadmaps for the SDGs
- Related SDGs: SDG 17 Partnerships for the Goals
- Project Partners: DESA, IATT
- Challenges: Curation and selection of most important publications and other resources on the various aspects of AI strategies.
- Contacts: Mr Wei Liu, Sustainable Development Officer (liuw@un.org)

Project 10: FAO-UNSD project using satellite data and farm surveys to estimate crop statistics

The project aims to identify crops, map crop areas and estimate crop yield using satellite data and farm surveys.

- Project Type (Status): Software product (Development)
- Project Domain: Agriculture
- AI Approach/Activity: Supervised Machine Learning uses random forests and support vector machines
- Datasets: Satellite data and Farm surveys
- Related SDGs: SDG target 2.4
- Project Partners: FAO
- Membership/Secretariat-driven: Driven by UNSD and FAO
- Resources/Skills: We work with highly skilled data scientists, statisticians and computer engineers of international and national statistical agencies.
- Technology: UN Global Platform, https://marketplace.officialstatistics.org/earth-observation
- Challenges: While providing service through a Cloud-based environment, the biggest challenge is still making the tools and applications useful to national statistical agencies in developing countries by lowering the entry level of required technological knowledge.
- Contacts: Mr Ronald Jansen, Chief of Data Innovation and Capacity Branch, Statistics Division (jansen1@un.org, +1 212 963 5980)

Project 11: Estimating Port Calls using AIS vessel tracking data

The project aims to identify ships which are entering and leaving a port (by vessel type) using AIS vessel tracking data AIS data are real-time data of ship positioning. This is obtained as a global feed.

- Project Type (Status): Software product (Development)
- Project Domain: Maritime Transport
- AI Approach/Activity: Supervised Machine Learning uses random forests to estimate vessel types and carrying capacities
- Datasets: AIS vessel tracking data (https://comtrade.un.org/data/cache/AISdashboardMethodology.pdf)
- Related SDGs: SDG target 9.1
- Project Partners: UNCTAD, University of Oxford, ONS (UK)
- Membership/Secretariat-driven: Driven by UNSD
- Project Website (links): https://marketplace.officialstatistics.org/ais-weekly-port-calls;
- Resources/Skills: We work with highly skilled data scientists, statisticians and computer engineers of international and national statistical agencies, and research institutes.
- Challenges: UN Global Platform, see https://marketplace.officialstatistics.org/ais-data.
- Contacts: Mr Markie Muryawan, Chief of Trade Statistics Section, Statistics Division (Muryawan@un.org, +1 212 963 3083)

Project 12: LinkedSDG

A demo app that automatically extracts key concepts related to sustainable development from text documents and links them to the most relevant sustainable development goals, targets, indicators and series.

- Project Type (Status): Software product (Full-fledged development)
- Project Domain: SDG ontology
- AI Approach/Activity: This uses Semantic Web technologies and ontologies, which is a subfield of AI and Computer Science research
- Datasets: Sustainable Development Goals Taxonomy (http://metadata.un.org/sdg/?lang=en)
- Related SDGs: All SDGs
- Project Partners: DESA- Division for Sustainable Development Goals
- Membership/Secretariat-driven: Driven by DESA
- Project Website (links): http://linkedsdg.apps.officialstatistics.org/#/; https://sustainabledevelopment.un.org/LinkedSDGs/about
- Resources/Skills: Statisticians and computer engineers of DESA
- Technology: UN Global Platform
- Contacts: Mr Luis Gonzalez Morales, Chief of Web Development and Data Visualization Section, Statistics Division (gonzalezmorales@un.org, +1 212 963 0692)

2. Related Sustainable Development Goals

All SDGs, especially SDGs 7, 9, 16, and 17.

3. Relevant links

https://www.un.org/development/desa/en/

Contact Information

- Mr Deniz Susar, Governance and Public Administration Officer (susar@un.org, + 1 212 963 8421)

United Nations Development Programme

1. Description of Activities on AI

Project 1: AI-enabled COVID-19 Impact Assessments

UNDP's China Country Office published a report to assess the impact of the COVID-19 pandemic on POEs and SMEs and their ability to implement the Sustainable Development Goals (SDGs). All findings are based on nearly real-time evidence, constituting a meta-analysis of over 78,000 SMEs and large POEs. The AI Lab at WeBank conducted analysis on the economic recovery of SMEs utilizing satellite imagery, GPS data, social media analysis, and their AI platform. UNDP China worked closely with the lab to integrate the WeBank analysis in UNDP's assessments and into UNDP's report.

- Project Type (Status): Research/Study paper (Closed)
- Project Domain: Economic Recovery
- AI approach: Statistical methods / algorithms
- Datasets: Mobile internet platforms
- Related SDGs: SDG 8 Decent Work and Economic Growth, SDG 17 Partnerships for the Goals
- Project Partners: External: WeBank, GoldenBee Management Consulting
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.cn.undp.org/content/china/en/home/library/crisis_prevention_and_recovery/assessment-report-on-impact-of-covid-19-pandemic-on-chinese-ente.html

Project 2: AI-powered robots for children

ImpactAim (AIM) is an independent platform created in 2017 and run by UNDP Armenia, which brings together the government, the private sector and development agencies to develop innovative tech startups that target the advancement of specific sectors (e.g., agriculture, climate, govtech, etc.) and have a financially sustainable and scalable business model.

The AIM community, with a pipeline of 25 innovative impact ventures and 5 Internationally renowned technology partners, is now in the intensive process of creation and redefining of business and impact models to best support and mitigate the negative impact of COVID-19. One such solution is Robin, an AI-powered robot which interacts with hospitalized children. These interactions help children overcome stress and anxiety: pilots with over 100 children show a self-reported increase in joyfulness of more than 26% and a more than 34% reduction in stress.

Robin is 47 inches tall and made of recyclable bioplastic which can easily be sterilized with ultraviolet light or other disinfectants to minimize the risk of spreading viruses.

- Project Type (Status): Other (Deployment)
- Project Domain: Health

- AI approach: Natural Language Processing, Facial Recognition
- Related Sustainable Development Goals: SDG 3 Good Health and Well-being, SDG 17 Partnerships for the Goals
- Project Partners: External – Expper technologies
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.forbes.com/sites/jeffkart/2020/06/17/robin-the-robot-comforts-kids-in-hospitals-can-help-with-covid-19/#25db6c3174cc

Project 3: AI analysis to identify gaps in judicial process

UNDP Brazil has supported the application of artificial intelligence to enlarging access to justice in Brazil. In partnership with the National Council of Justice (CNJ), it was developed an AI solution to analyze data of courts from all the country to identify causes of gaps in judicial process and contribute to improve efficiency and resources allocation planning of the Brazilian Justice. During the project implementation, the CNJ IT staff was also trained to keep on developing/applying AI related solutions, also representing a capacity development gain for the Council.

- Project Type (Status): Report (Closed)
- Project Domain: Governance
- AI approach: Machine learning
- Datasets: Court and judicial data
- Related Sustainable Development Goals: SDG 16
- Project Partners: External – National Council of Justice
- Membership or Secretariat-driven: Membership-driven

Project 4: Integrated Digital Assessments

Due to the need for comprehensive and timely information for evidence-based decision-making to support for better situational awareness at the times of crisis, UNDP has rolled out two digital assessment tools with global outreach and local implementation, carried out with a governmental counterpart as a partner in the process:

- The *Household and Building Damage Assessment Tool (HBDA),* which supports countries' authorities to assess disaster damage on residential and non-residential infrastructure, as well as the impacts on households;
- The *Digital Socio-Economic Impact Assessment Tool (Digital SEIA)*, which targets mainly vulnerable households and micro, small and medium enterprises affected by COVID-19.

These toolkits are used for the design and implementation of rapid—multi-topical and integrated—assessments; integrating the innovative secondary data sources (Social media data, Satellite imagery, National statistical data..); and the use of digital data collection and visualization tools. Currently these toolkit have been rolled out in 60+ Countries supporting various population (from Indigenous communities to informal settlements populations, through the informal economies to smallholder agriculture) and partnering with stakeholders across the spectrum (from Local NGOs, other UN agencies to Private entities). Through their various cutting-edge digital instruments, these Integrated Digital Assessments provide the much-needed decision support base for impactful policymaking.

- Project Type (Status): Software Product- Training, Digital tools, Alternative tools, Tailored support, vulnerability and needs assessments (Deployed- Digital SEIA has been rolled out in 60+ COVID-19 affected countries. HBDA has been rolled for the Dominica and Bahamas Hurricane, Albanian Earthquake and currently in preparation for the rolling out for the Latin American Hurricane season and African Tropical season)

- Project Domain: Livelihoods, Climate change and Natural Disasters, human and enterprises resilience, Socio-economic impact assessment
- AI approach: Statistical methods, Image recognition (for automating damage assessment), Natural Language processing (Social media analysis), Machine learning, deep learning
- Datasets: Historical Satellite imagery, Social media data sets, Census data, Survey data
- Related Sustainable Development Goals: SDGs 1, 2, 5, 8, 9, 10, 11, 13, 16, and 17
- Project Partners: External- REACH and QCRI
- Membership or Secretariat-driven: This project is part of the Country support management (CSMT) team under UNDP Crisis Bureau. Through CSMT, project directly supports all the countries with UNDP CO presence
- Project Website (link): http://www.undp.org/content/buildingdamageassessment/en/home.html

2. Related Sustainable Development Goals

SDGs 1,2,3,5,8,9,10,11,13,16, and 17. In particular,

- SDG 1: Promoting no poverty through the impact assessment
- SDG 3: Promoting good health and well-being of children through Armenia's robot app
- SDG 8: Promoting economic recovery through AI-powered impact assessment
- SDG 16: Promoting strong institutions through analysis of judicial gaps
- SDG 17: Partnering with private sector (WeBank, Expper technologies, etc.) on various projects

Contact Information

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- China: Mr Zhang Wei, Deputy Resident Representative, UNDP China (wei.zhang@undp.org)
- Armenia: Ms Ruzanna Safaryan, ImpactAim Venture Accelerator Lead, UNDP Armenia (ruzanna.safaryan@undp.org)
- Impact Assessments: Mr Fabrizio Andreuzzi, Rapid Response and Preparedness Specialist – UNDP Crisis Bureau (fabrizio.andreuzzi@undp.org)

United Nations Department of Political and Peacebuilding Affairs and Depertment of Peace Operations

1. Description of Activities on AI

Project 1: AI-powered large-scale synchronist dialogues

UN DPPA continues to expand its work on fostering inclusivity in peace processes through new technologies. In June 2020, the Office of the Special Envoy of the Secretary-General for Yemen (OSESGY), with the support of the UN DPPA Innovation Cell and in partnership with a number of national and international non-governmental organizations, ran a first-ever AI-assisted, large-scale virtual consultation with Yemeni citizens on the opportunities and challenges of the ongoing peace process. Allowing for real-time online discussion in combination with polling, it provides the possibility for senior mediators to dialogue with and poll peace constituencies at scale, with live analysis of their views at relatively low cost. During the interactive online discussion in Yemeni Arabic dialect, over 500 Yemeni participants, a third of them women, expressed their views on a nationwide ceasefire, the future of the political process, and the need for measures to alleviate humanitarian suffering.

- Project Type (Status): Event/Meeting (Deployment and testing)
- Project Domain: Mediation/Dialogue
- AI approach: Machine Learning, Natural Language Processing
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Private sector
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://dppa.un.org/en/innovation
- Opportunities: Technology know-how of private sector partners

Project 2: Toolkit on Digital Technologies and Mediation in Armed Conflict

DPPA's Project on Digital Technologies and Mediation in Armed Conflict assesses the opportunities and risk of using digital technologies, including AI, in mediation. As part of this broader effort, UNDPPA's Mediation Support Unit (MSU) hosted an online interactive briefing in July on how parties in armed conflicts might use Artificial Intelligence (AI) technologies for political and military purposes, and the implication of such use for peace processes. The session aimed at increasing understanding of the already extant use of AI technologies by state and non-state actors in intra-state civil wars and explored prospective applications of AI to support the mediation of peace and ceasefire negotiations. Future events under this workstream will focus on the application of specific AI applications to a small set of concrete mediation challenges.

- Project Type (Status): Research (Development)
- Project Domain: Mediation/Dialogue
- AI approach: Machine Learning, Natural language processing, Choice Modelling, Sentiment Analysis

- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Centre for Humanitarian Dialogue, ICRC
- Membership or Secretariat-driven: Secretariat-driven

2. Related Sustainable Development Goals (SDGs)

SDG 16 Peace, Justice and Strong Institutions

Contact Information

- Mr Enrico Formica, Senior Mediation Officer (enrico.formica@un.org, +41 22 917 2704)

United Nations Economic Commission for Europe

1. Description of Activities on AI

Project 1: Validation Method for Automated Vehicles

UNECE is working in the framework of the 1958 and 1998 Multilateral Agreements (allowing for the adoption of technical regulations) on the development of a methodology that can be used by the national and regional competent authorities for the assessment of the artificial intelligence used in automated vehicles. This work is co-Chaired by Japan, Canada and the Netherlands.

a. Regulatory work under the World Forum for Harmonization of Vehicle Regulations (WP.29)

The UNECE Sustainable Transport Division provides the secretariat services to WP.29, the World Forum that incorporates into its regulatory framework the technological innovations of vehicles to make them safer and more environmentally sound.

Since November 2014, WP.29 has been working on technical regulations for automated and autonomous vehicles. In this context, the screening of vehicle technologies showed that AI has found some prominent applications in the automotive sector. Some of these applications are related to infotainment and vehicle management (as Human Machine Interface (HMI) enhancement) e.g. infotainment management (incl. destination entry in the navigation systems). Some applications are related to the development of the vehicle self-driving capability

WP.29, being the regulatory body managing the three Multilateral Frameworks related to the construction of vehicles, their subsystems and parts as well as the periodic technical inspection of road vehicles, is monitoring these technological developments. WP.29 did not take any action framing the use of AI in vehicles to avoid limitations to innovation and technological development, as regulatory measures would be premature. WP.29 adopted the Framework Document for Automated Vehicles drafted by the China, European Union, Japan and the United States of America. It contains the Safety Vision for automated Driving as well as Key Safety Aspects relevant for these products.

b. The yearly Future Networked Car Symposium

During the 2019 event of the Future Networked Car event organized by UNECE and ITU, held on the first public day of the Geneva International Motor Show, representatives of vehicle manufacturers, the automotive and information and communication technology (ICT) industries, governments and their regulators to discuss the status and future of vehicle communications and automated driving. The Future Networked Car examined advances in connected vehicles, from the perspectives of business, technology and policy. One session was dedicated to AI with a presentation of the UNICRI Centre for Artificial Intelligence and Robotics and a report of the IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems. During the 2019 session, the FNC explored automated capabilities and AI in the vehicle, their status and the corresponding expectations.

– Project Type (Status): Regulatory activity in the framework of the Agreements above (Initiated)

- Project Doman: Automotive
- AI approach: Technology neutral, covering technologies involved in automated driving incl. Artificial Neural Networks, Statistical methods, Self-organizing map, Machine Learning, Deep learning, Natural language processing, Image recognition, etc.
- Related SDGs: SDGs 3, 9, 11, 13 and 17
- Project Partners: Member states representatives of the automotive sector, motorists, consumers
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://undocs.org/ECE/TRANS/WP.29/2019/34/rev.2; https://wiki.unece.org/pages/viewpage.action?pageId=60361611; http://www.unece.org/automated-vehicles

Project 2: The United for Smart Sustainable Cities initiative (U4SSC)

In 2016, UNECE and the International Telecommunication Union (ITU) established the UN global initiative United for Smart Sustainable Cities (U4SSC), which currently involves 16 UN bodies. U4SSC is a global platform for smart cities stakeholders, which advocates for public policies to encourage the use of ICT to facilitate the transition to smart sustainable cities. The initiative aims to: Generate guidelines, policies and frameworks for the integration of ICTs into urban operations, based on the SDGs, international standards and urban key performance indicators (KPIs); and help streamline smart sustainable cities action plans and establish best practices with feasible targets that urban development stakeholders are encouraged to meet. The topics of this phase of U4SSC are: circular cities, financing smart sustainable cities projects, blockchain in cities, artificial intelligence in cities, sensing technologies and Internet of Things in cities.

The initiative delivers policy guidelines and training materials through the work on specific outputs elaborated via regular e-meetings and physically gathers once per year. In 2017, the U4SSC stakeholders also elaborated a set of Key Performance Indicators (KPIs) for smart sustainable cities which includes 92 indicators (core and advanced) divided in the 3 dimensions of sustainable development: economy, environment, and society and culture. The indicators are fully aligned with the Sustainable Development Goals (SDGs) and serve as a tool for evidence-based decision making, progress monitoring and achieving the SDGs at the local level. They are being implemented by 50 cities of different sizes and development worldwide

- Project Type (Status): Framework/Strategy/Policy (other)
- Project Doman: Urban Operations
- AI approach: Framework/Strategy/Methodology Formation
- Related SDGs: SDGs 3, 9, 11, 13 and 17
- Project Partners: ITU and 16 UN bodies
- Project Website (links): www.unece.org/housing.html

Project 3: High-Level Group for Modernisation of Official Statistics (HLG-MOS) Machine Learning Project

Machine Learning (ML) holds a great potential for statistical organisations. It can make the production of statistics more efficient by automating certain production processes or assisting humans to carry out the processes. It also allows statistical organisations to use new data types of data such as social media data and imagery. Many national statistical offices (NSOs) are investigating how ML can be used in the context of official statistics which have to maintain rigorous standards for quality. While specific business environment may vary depending on country, NSOs face similar type of problems, therefore can benefit from developing shared understanding and solution within the broad official statistical community. HLG-MOS Machine Learning Project aims to demonstrate the value addition of ML, advance capability of NSOs to use ML and identify common issues encountered when incorporating ML in the organisation. The project consists of three work packages: 1) pilot studies to identify ML

application areas; 2) research on the quality implication of ML; 3) organizational aspects to integrate ML into production

- Project Type (Status): Research project (proof of concept)
- Project Domain: statistics
- AI approach: Pilot study countries are testing different ML techniques (random forest, Xgboost, Knn, fasttext, SVM, neural network, deep learning) in several application areas (text classification, edit and imputation, image classification) in their organisations
- Datasets: Survey data, census data, administrative register data; satellite imagery data
- Related SDGs: All SDGs
- Project Partners: 94 participants from 32 national and international statistical organizations
- Membership or Secretariat-driven: Project member-driven
- Project Website (links): https://statswiki.unece.org/display/ML
- Contacts: Ms InKyung Choi, Statistics Division (choii@un.org)

Project 4: Advisory Group on Advanced Technologies in Trade and Logistics (AGAT)

The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) has established the Advisory Group on Advanced Technologies in Trade and Logistics in order to advise and support the UNECE secretariat and UN/CEFACT on advanced technologies in trade facilitation and electronic business. The technologies in question include Artificial Intelligence (AI), Internet of Things (IoT), Distributed Ledger Technologies (DLT) such as blockchain, and - the most recent areas of rapid development in the international supply chain.

As we are at the intersection of several cutting-edge technologies that are redefining interactions between the physical and virtual world, driving disruption and enabling new business modes. The

importance of technology innovation is recognized in by the international community in Sustainable Development Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Technology fields such as Artificial Intelligence, Internet of Things, Distributed Ledger Technology, Quantum Computing, Cloud/Fog/Edge computing, 5G and connectivity related ones, hold significant promise in trade facilitation. Given these cutting-edge developments in technology, it becomes important to keep up to date with the latest trends to evaluate which trends and approaches may be viable for future developments, investments and practical implementation.

Advisory Group's activities are structured around the following work areas:

- Technical monitoring, assessment and advice, by monitoring and analyzing of the current and emerging technologies used in trade and logistics areas.
- Implementation challenges and good practices, by identifying and advising on business, legal and technical implementation issues of the technology and sharing best practices, with a specific focus on the support of decision making.
- Support strategic dialogue with key external stakeholders, by sharing knowledge and expertise through partnerships, the Work Area will reach out to trade and logistics management organizations and technical communities to exploit the benefits and to minimize the chance of working separately on the same issues;
- Proposition of new development in identified areas where new standards or guidance material are necessary and propose such work items to be launched within UN/CEFACT
  - Project Type (Status): Other (other)

- Project Domain: Trade and logistic
- AI approach: Analysing the use of technologies such as AI, Blockchain and the Internet-of Things in trade and logistic
- Contacts: Mr Tomas Malik, Secretary of the Advisory Group on Advance Technologies (AGAT) (Tomas.Malik@un.org, +41229172405)

2. Related Sustainable Development Goals

SDG 3, SDG 11, SDG 13, and SDG 17

3. Relevant links

https://www.unece.org/info/ece-homepage.html

Contact Information

- Mr François E. GUICHARD, Engineer/Secretary of the Working Party on Automated/Autonomous and Connected Vehicles (francois.guichard@un.org, +41 22 917 1112)

United Nations Environment Programme

1. Description of Activities on AI

Project 1: Use Case/Problem Statement

To show how water ecosystems are changing over time. A water related ecosystems monitoring project, aided by Google Earth Engine and the European Commission's Joint Research Center. It works through the application of computer vision and machine learning algorithms to recognize water bodies in satellite image data and map reservoir trends over time.

- Project Type (Status): Research/Study paper (Development)
- Project Domain: Water ecosystems
- AI Approach: Computer vision and ML algorithms
- Datasets: Satellite images on water bodies, data on water reservoir trends.
- Related SDGs: SDG 6 Clean Water and Sanitation, SDG 17 Partnerships for the Goals
- Project Partners: European Commission's Joint Research Centre Google Earth
- Project Website (links): https://www.sdg661.app/
- Technology: Google Earth

Project 2: Smart match making of stakeholders

The project aims to do smart matching making of stakeholders in a database based on stakeholder profile, and the various interactions between stakeholders, such viewed, connected.

- Project Type (Status): Web application (Ideation)
- Project Domain: Multi domain
- AI Approach: Association rule learning
- Datasets: Stakeholder profiles, stakeholder connections (view, connected)
- Resource/Skills: Machine Learning Developer
- Technology: Python
- Challenges: Dataset to train the algorithm. An attempt is being considered to produce generated datasets based on a sample small set of survey data.

Project 3: UNEP Q&A Chatbot

Conversational agent designed to initiate dialogue with and respond to user queries through an electronic interface as responding to Frequently Asked Questions (FAQs) manually is cumbersome and time consuming.

- Project Type (Status): Web application (Ideation)
- Project Domain: Multi domain
- AI Approach: Natural Language Processing (NLP)
- Resource/Skills: AI Expert
- Technology: Chatbot
- Challenges: More Data is required, lack of in-depth expertise within the organization hence the need to engage AI experts, lack of systems infrastructure necessary for building and deploying these applications.

Project 4: SDG Meter

A myriad of textual documents produced / consumed by UNEP need to be mapped to SDGs (project proposals, reports, briefings, etc). Such mapping exercises demand extensive expert time and rely on personal knowledge of interlinkages among topics and SDGs. While UNEP counts with experts in several topics, interlinkages with SDGs outside our expertise can be missed out. A web platform is proposed as an aid tool to analyse text document via an algorithm and rate relation to each of the 17 SDGs.

- Project Type (Status): Web application (Minimum viable product)
- Project Domain: Sustainable Development Goals
- AI Approach: Natural Language Processing (NLP), Natural language Generation (NLG), Deep Learning
- Datasets: SDG targets, SDG Objective, Generated Texts, SDG Synonyms definitions, SDG keywords
- Related SDGs: All SDGs
- Project Partners: ISEP (Institut supérieur d'électronique de Paris)
- Resource/Skills: AI expert, linguist, knowledge manager
- Technology: Multilabel classification with BERT (Python)
- Challenges: Budget and formalisation of a UNEP product is required to further develop the tool (training the algorithm), enable its deployment in multiple platforms (as a CMS plugin), and form a sustainable inter-organisation network with similar projects (OECD, UNESCO, IISD, academia, etc.) for collaborative enhancement.

Project 5: Machine Learning applied to chemicals in products and the environment

Interoperability is a key challenge for exchanging information and interlinking knowledge domains. This project aims to dynamically learn from chemical, industrial and environmental taxonomies, ontologies, and data sources to establish linkages among nodes and bridge knowledge gaps as well as to indicate risks and hazards for people and the environment.

- Project Type (Status): Ontology (Ideation)
- Project Domain: Chemicals
- AI Approach: Natural Language Processing (NLP), Machine learning, ontology, taxonomy, visualisation of nodes
- Project Partners: ISEP (Institut supérieur d'électronique de Paris), SAICM, Cambridge University
- Resource/Skills: AI expert, Chemicals expert, linguist, data scientist, knowledge manager

Project 6: Spatio-Temporal forecasting of Methane Super-emitters using heterogeneous data stream

Data on methane super emitters is available via different monitoring methods and formats. This project's aim is two-fold: initially to create a global map combining available live data sources on methane emissions (satellite images, numeric values, self-reporting, text, etc.) to then predict where and when methane super-emissions will take place.

- Project Type (Status): Research/Study paper (Ideation)
- Project Domain: Methane emissions, GIS
- AI Approach: Computer vision and ML algorithms
- Project Partners: ISEP (Institut supérieur d'électronique de Paris)
- Resource/Skills: AI PhD student, methane experts, data scientists, knowledge manager

Project 7: Promotion of Countermeasures Against Marine Plastic Litter in Southeast Asia and India (Counter MEASURE project)

The project aims to identify a region-based model for monitoring and assessment of plastic leakage and pollution reduction targeting land-based plastic leakage entering waterways such as rivers and canals or drainages to the sea. As a part of monitoring practice, we developed a machine learning algorithm to detect plastic pollution from aerial images using a drone in order to establish a standardized and cost-effective survey method.

- Project Type (Status): Framework/Strategy/Policy (Development)
- Project Domain: Chemical, Waste and Air Quality- Plastic Pollution
- AI Approach: The prediction of the presence or absence of litters is conducted using deep learning for each area using the slide window method. While we examined advanced objects detection models such as FastR-CNN and YOLO, we selected the conventional slide window method as this method is considered as a relevant approach to detect relatively small objects in the images speedy in a cost-effective manner.
- Datasets: Litters images in aerial photograph took by a commercial drone (3,423 images with litters and 7,000 images without litters in total 761,400□ shooting area). Aerial photographs condition (altitude 30m or less and 4K (3840 x 2160 pixels) resolution).
- Related SDGs: SDG 12 Responsible Consumption and Production, SDG 14 Life below Water
- Project Partners: Pirika Inc Asian Institute of Technology
- Resource/Skills: Drone Expert, AI expert (Object Detection with Deep Learning), Local coordinator to get permission from local authority to fly drone
- Technology: Google Vision API
- Challenges:
    - Effects of shooting method and conditions for aerial images- Because of the characteristics of the region and seasons, most of the litters were covered with sand. Hence, there was little difference between an object and the background in an image.
    - Alignment with transfer learning- Transfer learning is a method of improving the accuracy of the task that one originally wants to work by using the "weight" of the model already trained for some task as an initial value. For successful transfer learning, there are many cases where it is possible to hypothesize that there is some relationship between tasks. We tested to use the trained model with the ImageNet dataset. However, since many of the litters distributed in the project site were covered with sand, ImageNet dataset was not relevant to create a model; thus, transfer learning did not work well.
- Lesson Learned:

- Case classification and model creation- When targeting rivers of which conditions change significantly, this can be done by (1) creating a more general-purpose model or (2) creating case-specific models The former will be useful when expanding the survey area in the future, but there will be a trade-off with accuracy. On the other hand, in the latter case, tuning will be required for each survey area, which will increase the cost. Therefore, it is effective to classify river conditions and types of litters from qualitative and quantitative analysis in advance, and then create a model for each case. A concrete example of case classification is as follows:
  - Classification by country/region/river status Instead of creating a model that covers all countries/regions, it is possible to create a model that does not require performance tuning by creating a model that suits their characteristics through classifying countries and regions that are similar to some extent by river conditions.
  - Classification by the size of garbage: The current model is created so as to predict all litters, but by creating a model for each size, it is possible to create a model that does not depend on river conditions.
- Aerial Image datasets; Since the shooting equipment, shooting methods, and rules regarding the legal system differ in each country/region, it is important to search for a uniformed shooting method that satisfies those conditions. When taking aerial shots at a new location, it is ideal for taking 200 or more images, and more is preferable. Alternatively, it is effective to collect image data of 50 to 100 images with a large number of litters and a total amount of litters exceeding 1,500.

Project 8: Marine Litter Digital Platform

UNEP has been mandated by Member States to establish a new digital online platform for marine litter that serves as a global observatory, solutions and collaboration center that integrates data, assessments, risk, knowledge, while prioritizing action and facilitating access to technology solutions and innovative financing

- Project Type (Status): Web application (Proof of concept)
- Project Domain: Marine litter
- Datasets: Earth observation datasets, citizen science generated datasets on marine litter and debris
- Related SDGs: SDG 14 Life below Water
- Project Partners: IBM, CSGP (Citizen Science Global Partnership), Wilson Center
- Membership/Secretariat-driven: UN Science-Policy-Business Forum on the Environment, Global Partnership on Marine Litter
- Relevant links: https://www.forbes.com/sites/jeffkart/2020/08/10/why-ibm-built-an-ai-avatar-to-answer-questions-about-marine-litter/#7bc380932923, https://un-spbf.org/big-data/ibm-digital-platform-marine-litter/
- Resources/Skills: AI expert, marine litter domain expert
- Technology: IBM Watson technology

2. Challenges and Opportunities

- **Challenges**
  - More datasets are required to make a prediction in funding trends which drives the need to collaborate with external providers.

  - Current lack of in-depth expertise within the organization. Hence a need to engage AI experts to grow UN Environment's capacity in AI through training and project consultancy.
  - The visual modelling / algorithm tool has limitations for complex issues.
  - Lack of systems infrastructure necessary for building and deploying these applications.

- **Opportunities**
  - There is potential to scale the application of the machine learning tools to similar projects to the use cases above within the organization.
  - Staff members across the organization at UNEP have shown a great interest in understanding how AI can support their work and applying its capabilities in support of the environmental agenda.
  - Acquisition of an expert from an established organization in the AI domain to facilitate AI capacity building, consultancy and training within the organization.
  - Strategic partnerships with industry players with the relevant technical expertise, as well as earth-related big datasets. As the leading global environmental authority that sets the global environmental agenda, UNEP has the capacity to provide the partners with substantive knowledge related to the environment.

3. Related Sustainable Development Goals (SDGs)

All SDGs, especially SDGs 6, 12, 14, and 17

4. Relevant links

www.unenvironment.org

Contact Information

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United Nations
Educational, Scientific and
Cultural Organization

United Nations Educational, Scientific and Cultural Organization

1. Description of Activities on AI

Project I: HLCP intersessional meeting on the Ethics of AI

UN system wide contribution to the UNESCO Ad hoc expert group that is developing the draft text of the normative instrument on the ethics of AI and discussion on interagency cooperation to promote ethics of AI

- Project Type (Status): Consultation meeting and report (Completed)
- Project Domain: Ethics of AI
- AI approach: Support the development of the first global normative instrument on ethics of AI
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: UN entities, HLCP Secretariat
- Membership or Secretariat-driven: HLCP
- Contacts: Mr Eliot Minchenberg (e.minchenberg@unesco.org +33 1 45 682 313), Ms Dafna Feinholz (d.feinholz@unesco.org +33 1 45 681 736), Ms Clare Stark (c.stark@unesco.org +33 1 45 819 86)

Project 2: AI, Data and Languages - Development of datasets for low resource languages in Africa

Development of Datasets in low resource African languages to strengthen access to information using AI/ML. Development of innovation use cases based on datasets created. Capacity building and policy exchange for strengthening multilingualism in low resource languages.

- Project Type (Status): Datesets, Training, Technical Guidelines (Development)
- Project Domain: AI, Data, Languages
- AI approach: Dataset development, use of datasets for innovative AI-based applications
- Datasets: In five African languages
- Related SDGs: SDG 9 Industry, Innovation and Infrastructure, SDG 16 Peace, Justice and Strong Institutions
- Project Partners: AI4D Network, Masakhane, Open4Good Alliance
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Mr Bhanu Neupane (b.neupane@unesco.org +33 1 45 681 083)

Project 3: AI Capacity Building Needs Assessment Survey

To understand the policy priorities and capacity building needs of Member States in Africa with respect to AI.

- Project Type (Status): Report (Development)
- Project Domain: AI, Public Policy, Capacity, Building
- AI approach: Survey of Member States
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: IDRC, K4A, AI4D Network
- Membership or Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/news/unesco-launches-artificial-intelligence-capacity-building-needs-assessment-survey-africa-region
- Contacts: Mr Bhanu Neupane (b.neupane@unesco.org, +33 1 45 681 083)

Project 4: Artificial Intelligence Policies Around the World

Review of AI Strategies and Policies launched by countries around the world to facilitate knowledge exchange among Member States on the tools available to governments for the development and use of AI at the national level under different domains

- Project Type (Status): Report (Development)
- Project Domain: AI, Public Policy
- AI approach: Review Report
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: Sciences Po, Paris
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Ms Sasha Rubel (s.rubel@unesco.org, +33 1 45 680 442)

Project 5: AI and Judiciary: Online Learning Module

Development of a training module for judicial actors on AI and the rule of law

- Project Type (Status): MOOC (Ideation)
- Project Domain: AI and the rule of law
- AI approach: Training
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: CETIC.br, IEEE, The Future Society
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Ms Sasha Rubel (s.rubel@unesco.org, +33 1 45 680 442), Mr Guilherme Canela De Souza Godoi (g.godoi@unesco.org +33 1 45 680 467)

Project 6: AI Foresight

Guidance for decision makers on how AI could shape different areas of society in the future, with thought pieces, recommendations and use cases

- Project Type (Status): Report (Ideation)
- Project Domain: AI, Public Policy

- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: MILA
- Membership or Secretariat-driven: Secretariat Drive
- Contacts: Ms Sasha Rubel (s.rubel@unesco.org, +33 1 45 680 442)

Project 7: AI Explained: Youth Empowerment through Knowledge

Development of animation for youth literacy on implications of AI

- Project Type (Status): Animation (Development)
- Project Domain: AI, Youth
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Mr Ito Misako (m.ito@unesco.org, +66 2 391 0577), Mr Yufan Hu (yu.hu@unesco.org)

Project 8: AI Capacity Building Conference

Conference to facilitate knowledge exchange on AI policies, capacity building and real problem solving through involvement of AI Decision Makers in Governments, Private Sector, Civil Society and Academia

- Project Type (Status): Conference (Ideation)
- Project Domain: AI, Public Policy, Capacity Building
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Project Partners: Government of Japan
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Ms Sasha Rubel (s.rubel@unesco.org, +33 1 45 680 442)

Project 9: Artificial Intelligence and Gender Equality: Key findings of UNESCO's Global Dialogue to be published end of August

Key findings from UNESCO's Global Dialogue on AI and Gender Equality

- Project Type (Status): Report (In progress)
- Project Domain: Gender equality and AI
- Related SDGs: SDG 5 Gender Equality
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Ms Saniye Gülser Corat (SG.Corat@unesco.org, +33 1 45 681 744)

Project 10: Recommendation on the ethics of AI

Development of a global standard-setting instrument in the form of a recommendation

- Project Type (Status): International Instrument (In progress)
- Project Domain: AI ethics
- AI approach: Constitution of an expert group; production of background documents; global, regional, and sub-regional consultations; intergovernmental negotiations
- Related SDGs: SDG 4 Quality Education, SDG 5 Gender Equality, SDG 8 Decent Work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure, SDG 10 Reduced Inequalities, SDG 13 Climate Action, SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals

- Project Partners: Government of Japan, Government of the Netherlands, Government of Kuwait, Government of the Republic of Korea, Government of Egypt, Government of Argentina, Government of Slovenia, Government of Senegal, Government of Rwanda, Government of South Africa, University of Pretoria, University of Stellenbosch, Centre for Artificial Intelligence Research (CAIR), International Research Centre on Artificial Intelligence (IRCAI), Rathenau Institute
- Membership or Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/artificial-intelligence/ethics
- Contacts: Ms Dafna Feinholz (d.feinholz@unesco.org, +33 1 45 681 736)

Project 11: Report of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) on the ethical implications of the Internet of Things (IoT)

Capacity-Building tool in the form of an expert report.

- Project Type (Status): Expert Report (In progress)
- Project Domain: Ethics of science and technology
- AI approach: Organization of working groups with international experts / Production of a report
- Related SDGs: SDG 4 Quality Education, SDG 8 Decent Work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure, SDG 10 Reduced Inequalities, SDG 13 Climate Action, SDG 16 Peace, Justice and Strong Institutions
- Membership/Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/themes/ethics-science-and-technology/comest
- Contacts: Ms Dafna Feinholz (d.feinholz@unesco.org, +33 1 45 681 736)

Project 12: Series of public debates on the impact of AI on culture in 2018-2019

As digital content and delivery platforms continue permeating all forms of media and cultural expressions, leading to an increasing concentration of supply, data and income, the role of AI will undoubtedly expand, which raises important questions: Does AI have the potential to become a true creative partner? Can AI be the sole producer of a work of art?

- Project Type (Status): Series of public debates with artists, decision-makers, industry specialists and civil society representatives on the impact of AI on cultural and creative industries (Completed)
- Project Domain: Culture, arts, cultural and creative industries
- AI approach: Public debates at UNESCO HQ; live event
- Related SDGs: SDG 8 Decent Work and Economic Growth, SDG 17 Partnerships for the Goals Membership or Secretariat-driven: Secretariat Driven
- Contacts: Mr Laurence Mayer-Robitaille (l.mayer-robitaille@unesco.org, +33 1 45 681 487)

Project 13: Programme to protect and promote the diversity of cultural expressions in the digital environment

The goal of this project is to strengthen the capacity of Parties to the 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions to adapt or adopt cultural policies and measures that protect the diversity of cultural expressions in the digital environment.

- Project Type: Policy making (Ongoing)
- Project Domain: Culture
- AI approach: Exploratory study identifying needs and priorities, especially in developing countries; assistance and advice in the development of national roadmaps to implement the 2005 Convention in the digital environment

- Related SDGs: SDG 8 Decent Work and Economic Growth, SDG 10 Reduced Inequalities, SDG 16 Peace, Justice and Strong Institutions, SDG 17 Partnerships for the Goals
- Membership or Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/creativity/publications/open-roadmap-implementation-2005-convention
- Contacts: Mr Laurence Mayer-Robitaille (l.mayer-robitaille@unesco.org, +33 1 45 681 487)

Project 14: Policy Guidelines for AI and Education

The rapid development of AI has so far outpaced policy debates and regulatory frameworks. If policy makers in education systems are not prepared, the imminent concerns associated with AI when it is deployed in education, teaching, and learning systems– such as the misuse of personal data- could actually exacerbate rather than ameliorate existing inequalities.

- Project Type (Status): A publication on the Guidelines and capacity building workshops (The script of the Guidelines has been finalized)
- Project Domain: Policy, capacity building
- AI approach: Report review
- Related SDGs: SDG 4 Quality Education
- Membership or Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/themes/ict-education/action/ai-in-education
- Contacts: Mr Fengchun Miao (f.miao@unesco.org, +33 1 45 680 936)

Project 15: Teaching AI for K-12

The main goal of this initiative is to contribute to mainstreaming of AI skills into national curriculum development and training programmes. It will specifically develop an AI skills framework outline for K-12 schools, and curate AI skills development contents for K-12 schools.

- Project Type (Status): An AI skills framework and a web-portal on AI skills development (The script of the Guidelines has been finalized)
- Project Domain: AI skills, capacity building
- AI approach: AI tools/building web-portal
- Related SDGs: SDG 4 Quality Education
- Project Partners: Ericsson
- Membership or Secretariat-driven: Secretariat Driven
- Project Website (links): https://en.unesco.org/news/unesco-and-ericsson-launch-new-portal-teaching-ai-students
- Contacts: Mr Fengchun Miao (f.miao@unesco.org, +33 1 45 680 936)

Project 16: RockNet I

3D visit of geological site

- Project Type (Status): Virtual Visit of geological outcrop (New initiative)
- Project Domain: Science Education
- AI approach: Virtual visit of geological outcrop: photos are taken of a site by an airborne drone and reassembled to construct a 3D model representing the outcrop. A virtual panoramic visit in

3D will simulate the visit of a geological site in an entertaining manner. The area visited evolves dynamically, in interaction with the user.

- Related SDGs: SDG 4 Quality Education, SDG 15 Life on Land
- Membership or Secretariat-driven: Secretariat Driven
- Contacts: Mr Ozlem Adiyaman Lopes (o.adiyaman@unesco.org, +33 1 45 681 433)

Project 17: RockNet II

Smartphone application for lithological recognition by artificial intelligence for general public

- Project Type (Status): Application for mobile phone (New initiative)
- Project Domain: Informal science education
- AI approach: Use of AI to identify rocks photographed by app-user
- Related SDGs: SDG 4 Quality Education
- Project Partners: IFP Energies Nouvelles, French National Museum of Natural History
- Membership/Secretariat-driven: Secretariat Driven
- Contacts: Mr Ozlem Adiyaman Lopes (o.adiyaman@unesco.org, +33 1 45 681 433)

2. Related Sustainable Development Goals (SDGs)

SDGs 4, 5, 8, 9, 10, 13, 15 16, and 17

3. Relevant links

https://en.unesco.org/

United Nations Population Fund

1. Description of Activities on AI

Project 1: ECHO: Amplifying citizen's voices for the SDGs"

ECHO is a unique tool that uses Automatic Speech Recognition, Cognitive Computing, and Data Analytics to improve the efficiency in processing large amounts of information in real-time. ECHO collects information from individuals of all backgrounds, including minorities and vulnerable populations

ECHO is a tool powered by artificial intelligence that promotes citizens' participatory planning and awareness about the SDGs through real-time guided public discussion. ECHO is seeking to link conversational and informal citizen's language to SDGs language using a classification model, developed by UNFPA Colombia. After the first phase of the implementation of the interviews in Medellin through ECHO, we obtained, among other things:

a. More than 4,800 guided discussions were carried out, whose results in 56.22% were performed in women and 43.8% in men. Of the total number of respondents, 44.8% were young and 18.3% were older adults.

b. A pact for the SDGs was signed by more than 10 public institutions in Antioquia. These entities include Antioquia Governorate, National Police, EPM, Medellin Metro, Metropolitan Area of the Aburrá Valley, Inder, Medellín City Council, Teleantioquia and TeleMedellín, which makes Medellín the first city in Colombia to use AI to make better public policies and make deep commitments around the 2030 Agenda.

c. A draft of a Dashboard of the SDGs related to the main concerns of the people in these areas. It also contains a call to action and "What to do" related to the SDGs that resulted from the analysis.

d. Data collection campaigns have been conducted in many new cities such as Cartagena, Villavicencio, and the Venezuelan immigrant population in Medellin. Thus obtaining more than 3,000, 15,000 and 1,200 new testimonies in each city respectively.

The process will be cover groups of population of Medellin, Bogotá and Cartagena, three different zones and two of the largest cities of Colombia.

- Project Type (Status): Software project (Deployment)
- Project Domain: Participatory planning, Freedom of Speech
- AI approach: Automatic Speech Recognition, Cognitive Computing, Natural Language Processing (NLP)
- Datasets: ECHO stores all recorded and processed voice information (with NLP technology) in a structured manner. This then involves a large amount of information from recorded voice testimonials converted to text, stored as documents in noSQL databases.
- Related SDGs: all SDGs, especially SDG 17 Partnerships for the Goals

- Project Partners: UNFPA Innovation Secretariat, Antioquia Governorate, National Police, EPM, Medellin Metro, Metropolitan Area of the Aburrá Valley, Inder, Medellín City Council, Teleantioquia, TeleMedellín
- Project Website (links): www.echo-vis-2020.herokuapp.com, Echo Interviewer System: www .echo.carinalab.co, If you are interested and want to get access please write an email to nieto@ unfpa.org, https://echo.carinalab.co/#/mMedellin1,_Social Media Data Scraper (Beta): http:// 165.227.124.98/tweetsunfpa/
- Technology: GraphQL, Deep Learning IA, live speech to text
- Challenges: a) The urgency to achieve our organizational priority areas and leverage the power of AI toward that end. b) The prevalence of myths and misconceptions about contraceptives. c) The prevalence data and visualization. d) Humanitarian crisis: internal and external migration
- Opportunities: a) To accelerate our mandate through AI and cutting-edge technologies. b) The improve our impact including BC and C4D campaigns through among others the internet and social network messages, radio, public tv channels, public spaces, etc.

Project 2: Social Media Data Tracker (SMDT)

SMDT is a tool for scraping and identifying myths related to Sexual and Reproductive Health in social networks. Using natural language processing technologies, visual image processing and complex graph construction, SMDT is able to identify groups, users, themes, threads, etc., close and vulnerable to SRH myths.

SMDT is a project that seeks to scratch data from the social media, particularly tweets generated around sexual and reproductive health, including ideas about right and wrong ways to prevent pregnancy, and notions about relationships and contraceptive use. With the help of AI, specifically with Natural Language Processing, we could understand what people are thinking about the myths and misconceptions about contraceptive use. With the use of Natural Language Processing (NLP), we can structure this information, thus quantifying all the data collected (scraped).

With the use of image processing, and adding entity recognition data, we can get a very good focus on what is the belief about some contraceptives and what entities are related to those beliefs. With this knowledge generated, we can make the design of interventions and behavior change campaigns more specific and effective in getting people to change misconceptions about contraceptive methods.

Currently within the project we have been able to scratch more than 800,000 tweets related to Sexual and Reproductive Health, and have processed more than a third of them, finding myths and beliefs (SRH related) there.

- Project Type (Status): Software project (Data discovery)
- Project Domain: Reproductive health
- AI approach: Machine Learning, Natural language processing, Image Processing (ML), Sentiment analysis
- Datasets: We are implementing an integrated system of cross information between social network posts, people, campaigns, and official structured data of each region along with the demographic data. This is using noSQL databases to store the unstructured data, and graph-based databases to store the relationships.
- Related SDGs: SDG 3 Good Health and Well-being, SDG 17 Partnerships for the Goals
- Project Partners: UNFPA Innovation Secretariat
- Project Website (links): www.smdt-2020.herokuapp.com
- Technology: NLP (Word vectorization), Web Scraping, graph data storing, Repository (https:// github.com/whatevercamps/SMDT-labs)

2. Related Sustainable Development Goals (SDGs)

All SDGs, especially SGD 17

3. Relevant links

https://www.unfpa.org/

Contact Information

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United Nations Global Pulse

1. Description of Activities on AI

Project 1: Mapping the landscape of artificial intelligence applications against COVID-19

UN Global Pulse worked with researchers from the World Health Organization (WHO) and the MILA-Quebec AI Institute to map the landscape of AI applications that are being built to tackle the COVID-19 pandemic. The research focused on three specific areas: individual patient diagnosis and treatment, protein and drug discovery related research, and the socio-economic impact of the disease. This work also explains main challenges and opportunities for AI cooperation against COVID-19.

- Project Type (Status): Full-fledged development (Research/Study Paper)
- Datasets: Scientific Publications
- Project Partners: WHO, MILA- Quebec AI Institute
- Project Website (links): https://www.unglobalpulse.org/2020/03/mapping-the-landscape-of-artificial-intelligence-applications-against-covid-19/, https://www.nature.com/articles/s42256-020-0184-3, https://arxiv.org/pdf/2003.11336.pdf

Project 2: On the value of ship traffic data for epidemic modeling of diseases

UN Global Pulse set out to explore whether insights from Automated Identification Systems (AIS) data can be included in epidemic modelling of diseases, including COVID-19, to inform more efficient and timely operational responses.

- Project Type (Status): Development (Research/Study Paper)
- Datasets: AIS Vessel Data
- Project Partners: NYU
- Project Website (links): https://www.unglobalpulse.org/2020/03/from-plague-outbreaks-to-covid-19-on-the-value-of-ship-traffic-data-for-epidemic-modeling-of-diseases/, https://academic.oup.com/jtm/article/doi/10.1093/jtm/taaa072/5835704

Project 3: Using speech-to-text tech for epidemic intelligence and COVID19 response

Radio remains the most reliable and affordable medium of accessing and sharing information in most of the developing world. Since 2019, UN Global Pulse worked with the WHO to explore the use of data from radio talk shows to signal early warnings of health risks and health-related matters. More recently, our team used the radio monitoring technology it developed to extract transcripts containing COVID19 keywords and to analyse them. The research showed promising results for monitoring the ongoing health emergency, its social and economic impacts, and the spread of infodemics.

- Project Type (Status): Development (Software Product)

- Datasets: Radio
- Project Website (links): https://www.unglobalpulse.org/project/using-radio-broadcasts-to-augment-early-detection-of-health-risks/, https://www.unglobalpulse.org/2020/05/using-speech-to-text-technology-to-support-response-to-the-covid-19-pandemic/

Project 4: Developing an AI-powered platform for social listening

A second version of Qatalog—UN Global Pulse's text analytics tool that can extract, analyse, and visualise data from social media and radio broadcasts—was developed and released. Qatalog is an AI-powered tool that uses speech recognition technology developed by UN Global Pulse to 'listen' to public radio talk shows and automate the detection of words spoken during those shows. It also pulls in public Twitter streams, building on one of several partnerships established by UN Global Pulse with private sector data providers on behalf of the UN System. Lastly, it allows users to upload PDF documents for analysis. At the end of 2019, Qatalog offered users the option to choose from 39 different languages to analyse.

- Project Type (Status): Development (Software Product)
- Datasets: Social media, Radio, Text data
- Project Website (links): https://www.unglobalpulse.org/microsite/qatalog/

Project 5: PulseSatellite: A collaboration tool using human-AI interaction to analyse satellite imagery

UN Global Pulse has been working with UNOSAT over the last three years to build a software tool that leverages AI to identify and count structures from satellite images. This was then expanded to a web-based toolkit that can be easily adapted to other remote sensing applications and which allows for the incorporation of models created by other users. We already have three models loaded into the system- one that allows users to map structures in refugee settlements, a roof density detection model (e.g. for slum mapping), and a flood mapping application. Down the road, we plan to develop more models together with UN partners.

- Project Type (Status): Development (Software Product)
- Datasets: Satellite images
- Partners: UNOSAT
- Project Website (links): https://www.unglobalpulse.org/microsite/pulsesatellite/

Project 6: Using artificial intelligence to model displacement in Somalia

Predicting refugee and internally displaced persons (IDP) arrivals is of critical interest in humanitarian emergencies since field operations teams must prepare in advance for these arrivals. UN Global Pulse provided support to Project Jetson, an initiative of the United Nations High Commissioner for Refugees (UNHCR), which developed a dashboard early warning system that displays monthly predicted IDP arrivals for regions in Somalia.

- Project Type (Status): Development (Research/Study paper)
- Datasets: Multiple datasets
- Project Partners: UNHCR
- Project Website (links): https://www.unglobalpulse.org/project/using-artificial-intelligence-to-model-displacement-in-somalia/

Project 7: Understanding population movement after the 2018 Central Sulawesi natural disasters

Our Pulse Lab Jakarta and the International Organization for Migration (IOM) undertook research using data from an Indonesian telecom provider to gather insights on internal displacement of people

affected by a tsunami and subsequent landslides in the Central Sulawesi province of Indonesia. An interactive visualisation was designed to make sense of the results. Among its functions, the dashboard communicates the distribution of subscribers, and highlights the most popular destinations where people travelled to after the disasters.

- Project Type (Status): Full fledged development (Software product)
- Datasets: Mobile
- Project Partners: IOM
- Project Website (links): https://medium.com/pulse-lab-jakarta/understanding-population-movement-after-the-2018-central-sulawesi-natural-disasters-70ab95b7741b

Project 8: Making sense of diplomatic correspondence using big data analytics and visualization

Collaborating with the Indonesian Ministry of Foreign Affairs (MoFA), Pulse Lab Jakarta explored and produced a machine learning visualisation tool to help staff understand diplomatic correspondence between the Ministry and its diplomatic staff abroad. The tool enables MoFA to analyse, locate and make sense of their large volume of correspondence and improves analysts' abilities to provide relevant, timely and accurate counsel.

- Project Type (Status): Full fledged development (Software product)
- Datasets: Text data and reports
- Project Partners: Indonesian Ministry of Foreign Affairs

Project 9: Supporting development of ethical AI frameworks in the Global South

UN Global Pulse is working both in AI policy and AI innovation in target African countries in order to accelerate the adoption of AI-based innovation to support the achievement of the SDGs. These activities have informed UN Global Pulse's development of a blueprint to aid African nations in developing national AI strategies. UN Global Pulse will continue hosting national and regional consultations and dialogues with stakeholders in countries such as Ghana and Uganda to develop national AI strategies.

- Project Type (Status): Development (Framework/Strategy/Policy)
- Datasets: Text data and reports
- Project Partners: Indonesian Ministry of Foreign Affairs

Project 10: Developing ethical frameworks to support human rights-based approaches to AI

UN Global Pulse has established the Expert Group on Governance of Data and AI, an international group of expert stakeholders whose work emerged from the UN Global Pulse Privacy Advisory Group's work to develop a first draft of a code of ethics for AI focusing on human rights.

- Project Type (Status): Development (Framework/Strategy/Policy)
- Project Website (links): https://www.unglobalpulse.org/policy/data-privacy-advisory-group/?highlight=strategy

Project 11: Deploying AI social listening tools for real-time information to UN country teams

In line with the Secretary-General's Strategy on New Technologies, UN Global Pulse has assisted UN System Organizations in brokering partnerships with the private sector in order to gain access to AI-based tools. For instance, UN Global Pulse entered into an agreement with Dataminr- the leading AI

platform for first response- to provide UN personnel with access to their real-time event detection product for the public sector called First Alert.

- Project Type (Status): Full fledged development (Software product)
- Datasets: Social media and online media
- Project Partners: Indonesian Ministry of Foreign Affairs

Project 12: Assessing the risks, harms and benefits of AI-intensive projects

UN Global Pulse has developed a two-phase "Risk, Harms and Benefits Assessment Tool," a data privacy, protection, and ethics compliance mechanism designed to help identify and minimize the risks of harms and maximize the positive impacts of data and AI-fueled projects and tools. The assessment can be used at the onset of a project, or when an existing one needs to undergo changes, taking into account every stage of the data life cycle.

- Project Type (Status): Full fledged development (Framework/Strategy/Policy)
- Project Website (links): https://www.unglobalpulse.org/policy/risk-assessment/

Project 13: Developing a Global Data Access Framework

UN Global Pulse is a co-lead of the Global Data Access Framework (GDAF), which, as stated in the Secretary-General's Roadmap for Digital Cooperation, is a multistakeholder initiative that aims to create a platform for sharing digital public goods in a manner that respects privacy. Its main objective is to enable data sharing across the public and private sector in a privacy-protective manner by helping to develop and scale AI-driven projects. The GDAF will rely upon a state-of-the-art reference architecture that will be developed through a collaborative multi-stakeholder effort and will enable data to be discovered by AI systems more easily.

- Project Type (Status): Development (Framework/Strategy/Policy)
- Project Website (links): https://www.unglobalpulse.org/policy/global-data-access-framework/

2. Relevant links

www.unglobalpulse.org/

Contact information

- Mr. Miguel Luengo Oroz (miguel@unglobalpulse.org)

UN HABITAT
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United Nations Habitat

1. Description of Activities on AI

Project 1: Urban Security Observatory

The Urban Security Observatory (OBSU) is a component of the Project "Support to improve the governance of police services" (2019-2020) in Conakry, Guinea, with the aim to better understand the attitudes of users, police officers and institutions in charge of public security and to enhance relevant responsive decision-making and interventions in the physical environment to prevent and reduce insecurity on public roads and petty crime in public space. Anchored within the Strategy and Development Office (BSD) of the Ministry of Security and Civil Protection (MSPC), this observatory is jointly executed by the United Nations Development Programme (UNDP) and the United Nations Human Settlements Programme (UN-Habitat) with funding from the Peacebuilding Fund (PBF). The project has trained and equipped dedicated focal points from the security service deployed in a pilot zone (hot spots along the Hamdallaye-Kagbelen highway) and selected emergency services from hospitals, which ensure data collection and feedback via tablets. A Management Cell team is installed within the BSD of the MSPC in charge of data processing (four type of data collected), analysis, interpretation and reporting on quarterly basis to inform the Ministry's interventions.

- Project Type (Status): Software Project, Data collecting, Training (Proof of concept)
- Project Domain: Urban Security, Humanitarian
- AI approach: Statistical methods, Self-organizing map
- Datasets: Geographic Information System (GIS), Information Management System (IMS)
- Project Partners: Ministry of Security and Civil Protection, UNDP/ Guinea
- Resources/Skills: KoBoToolbox, Quantum GIS, KoBoCollect, Microsoft Office, GPS tool
- Challenges: Upscaling the geographical scope of the Observatory

Project 2: Public control of AI in Cities

UN-Habitat supports the Cities for Digital Rights Coalition which works to protect and uphold human rights on the internet at the local and global level. This city-led initiative aims to use procurement policies to encourage trustworthy AI. These mechanism aim to ensure that the public has access to understandable and accurate information about the AI system and how these impact their lives. They should be able to question to question and change unfair, biased or discriminatory systems. A Standard Procurement Clause and an AI-Registry were developed as policy tools to advance Public Control on AI in cities. If a Municipality uses an Algorithmic System that is provided by a Contractor, it can use such a clause to make certain arrangements with that Contractor to enable the City to make fair, lawful, and transparent Decisions using an Algorithmic System. Both the Procurement Clause and the AI Registry are proofs-of-concept and are now to be tested and implemented in other cities within the CC4DR network. Other policy tools, such as an Audit and Quality Framework, a Starterskit for Cities are currently being developed. In collaboration with Mozilla Foundation, the AINOW Institute

and NESTA a position paper was created on the important of Ethical Procurement Guidelines in AI. Procurement and contract conditions are both very powerful and practical instruments for public sector authorities to assure AI-enabled systems comply with fundamental rights. The Cities of London, Helsinki and Amsterdam have led this work, while other cities in the network are encouraged to use the newly developed tools.

- Project Type (Status): Report (Proof of concept)
- Project Domain: AI ethics
- AI approach: Policy
- Datasets: Geographic Information System (GIS), Information Management System (IMS)
- Project Partners: Cities for Digital Rights Coalition, Nesta, Mozilla Foundation, Amsterdam, London, Helsinki, AI Now
- Membership or Secretariat driven: Membership-driven
- Challenges: Upscaling through city members of the Cities for Digital Rights Coalition

Project 3: Fair AI in Cities - Cities Challenge program

Also a part of the Cities for Digital Rights Coalition, the purpose of this program is to facilitate applied research in digital rights and the responsible use of AI and automated decision making that is grounded in the real-world context of local governments. The goal is to produce replicable and scalable insights, guidelines and best practices; case studies; concrete improvements to real-world systems; and template or reference solutions that champion digital rights principles. In the program, local challenges are issued by CC4DR member cities and fall into each respective Digital Rights Declaration category. Research institutions, Principal Investigators, or teams of researchers are invited to join in the challenges and provide insight via qualitative data gathering of local government, case-studies while conducting in-depth use-cases studies of technology and political systems in local government or applicable solutions while creating a solution or pilot project that leverages digital rights. Examples are:

a. Fairness and accountability design needs for algorithmic support in high-stakes public sector decision-making
b. Dissecting racial bias in an algorithm used to manage the health of populations.
c. A case study of algorithm-assisted decision making in child maltreatment hotline screening decisions

Project 4: CC4DR Working Group on Fair AI in Cities

The Cities for Digital Rights Coalition working group on Fair AI from the CC4DR focuses on fair, accountable and transparent AI in cities. Cities join forces in this working group in order to develop tools, policy guidelines and best-practices in this field. Via events, online articles and webinars different methods, collaborations and use-cases are being shared. The Cities of Austin, New York, Amsterdam, London and Helsinki have previously shared their knowledge with other cities within the network. Guidelines for Ethical AI, Explainable AI mechanisms and an AI Ethics Training Course for employees are examples of joined deliverables so far. These deliverables are re-usable for other cities in the network. Moreover, the working groups stimulates ongoing peer-to-peer discussions among cities to leverage lessons learned so far as well as shared challenges ahead. In collaboration with Eurocities, a joined position-statement on AI was created. The working group is an ongoing initiative, driven by member cities and their local challenges.

Finally, potential partnerships are being established to leverage the network of cities as well as partner organizations.

- Project Type (Status): Recurring event (Event)
- Project Domain: AI ethics

- AI approach: Working group
- Datasets: Geographic Information System (GIS), Information Management System (IMS)
- Project Partners: Cities for Digital Rights Coalition
- Membership or Secretariat driven: Membership-driven

Project 5: GoLand Registry - Block chain technology- Innovation for Secure Tenure and Revenue Generation in Afghanistan, 2020-2025

UN-Habitat is supporting the Government of Afghanistan to leapfrog conventional technologies for land registration and land-based taxation. UN-Habitat has partnered with UNOICT to introduce blockchain technology to improve tenure security and increase municipal revenues to enhance stability, self-reliance and local economic development. The programme is developing an online hybrid cloud-based software solution, including training and support for:

a. Collection of primary land property data,
b. Validation of property data and storage in master database,
c. Processing of occupancy certificates with verification/authenticity system, and
d. Automation of safayi (municipal services) fee invoice issuance, receipting and records management.

The land registry process is a typical function that can benefit from the blockchain distributed ledger technology (DLT) given it provides end-users with the opportunity to collaborate through a common digital ledger that shows transaction history in real-time with no need for a central trusted authority ensuring its consistency.Also, data on the blockchain cannot be changed without the verification of all computers who own a copy of it. Owing to its distributed, decentralized and immutable features, blockchain technology creates increased trust, accountability, transparency and accessibility. The Afghan “goLandRegistry” system will use this emerging technology to map the property registration process as well as to ensure that land occupancy certificates details are anchored into a decentralized public blockchain environment.

- Project Type (Status): Concept Note (Software Product)
- Project Domain: Land registration
- AI approach: Blockchain development
- Datasets: Afghanistan land registry data
- Project Partners: Government of Afghanistan, UN OICT
- Membership or Secretariat driven: Secretariat-driven
- Project Website (links): https://sociable.co/technology/un-enlists-blockchain-in-afghanistan-for-transparency-in-rebuilding-process/

2. Relevant links

https://unhabitat.org/

Contact Information

- Mr Pontus Westerberg, Programme Management Officer, Innovation Section (pontus.westerberg@un.org)

United Nations High Commissioner for Refugees

1. Description of Activities on AI

Project 1: Project Jetson

Project Jetson is a predictive analytics experiment aimed at providing predictions on the movement of displaced populations within and outside of Somalia. It's a project initiated and launched by UNHCR's Innovation Service. Jetson technology is machine learning-based and it provides predictions on the movement(s) of displaced people. This experiment also combines data science, statistical processes, design-thinking techniques, and qualitative research methods. Jetson actively seeks new data sources, new narratives, and new collaborations in order to keep iterating, and improving. It has further underlined the importance of partnership, of collaboration, and of transparency.

- Project Type (Status): Software project (Active, under current revamping/review)
- Project Domain: Forced Displacement, East Horn of Africa (Somalia and Southern Border with Ethiopia, Dollo Ado)
- AI Approach: Machine learning (regression) Predictive Analytics
- Datasets: ACLED data (conflict), FAO SWALIM/FAO FSNAU data (markets and water resources data), UNHCR-PRMN Data (displacement data)- numeric data
- Related SDGs: SDG 16.13, SDG 17.18, SDG 10.7
- Project Partners: University of Essex (Human Rights, Big Data & Technology Project HRBDT), ACLED (for data), UN Global Pulse, FAO SWALIM, FAO FSNAU, UNHCR-NRC Protection and Return, Monitoring Network (PRMN), WMO-ICPAC, Uptake Foundation (capacity-building)
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://jetson.unhcr.org/
- Resources/Skills: Data Scientist, UX/UI Designer, Data Engineer
- Technology: Eureqa/Python/R/

Project 2: ARiN DHR Artificial Intelligence Project

ARiN is a web application developed by UNHCR Innovation Service for the affiliate partnerships and recruitment section (APRS) within the division of human resources (DHR). The application is machine-learning based and supports them with the screening process for external candidates coming from the UNHCR external talent pool applications. The talent pools are the most sought-after functional profiles within UNHCR, and they are dedicated to help respond urgently to forced displacement crises. There are approximately 29 talent pools that receive on average 8000 applications per month, which are majority text-based. Contrary to other off the shelf tools, ARiN was customized in order to comply

with the internal policies and rules for talent acquisition within UNHCR, which includes transparency of process, gender and diversity elements.

- Project Type (Status): Software project (Development)
- Project Domain: Global, Human Resources and Jobs
- AI Approach: Machine learning, Classification
- Datasets: Talent pool job applications- Text-based data
- Related SDGs: SDG 8.3
- Project Partners: Internal- UNHCR Innovation Service for the affiliate partnerships and recruitment section (APRS) within the division of human resources (DHR)
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://medium.com/unhcr-innovation-service/revolutionising-recruitment-a-test-for-ai-in-the-united-nations-4456df0b1431
- Resources/Skills: Front-End Developer, Back-End Developer, Data Engineer, Data Scientist, Bysiness Analyst, Users
- Technology: Python

Project 3: Remote protection monitoring: Syria

UNHCR Syria operation, as many other protracted conflict and other special situations '(e.g. COVID-19), have humanitarian access difficulties in accessing certain populations and/or geographical locations. For conducting protection monitoring, the team relies on partners reports and originally quantified the data using a Kobo form and a dashboard, counting manually the incidents in more than 700+ reports. UNHCR Innovation Service supported the team to experiment with AI using their original kobo form as training set to build a machine-learning based classification of protection incidents categories and subcategories from mission reports (free-text data) based on pretrained classified data.

- Project Type (Status): Software project (Project Type/Output)
- Project Domain: Forced Displacement
- AI Approach: Machine learning, Classification
- Datasets: Reports- Text based data
- Related SDGs: SDG 16.13, SDG 17.18, SDG 107
- Project Partners: UNHCR Syria, UNHCR Innovation Service
- Membership or Secretariat-driven: Secretariat-driven
- Relevant links: Internal. Access to documentation upon written request, with UNHCR Syria field operation approval
- Resources/Skills: Data Scientist, Data Engineer, UNHCR Protection team, UNHCR IM team
- Technology: Python

Project 4: Refworld

Refworld is a UNHCR repository of legal documentation that contains most of the legal framework on humanitarian affairs and refugee law. Many stakeholders- including legal teams that process refugee sensitive cases- use it as reference for precedents in the law and other court decisions to advance their own legal research. The UNHCR Division of International Protection won UNHCR Innovation Fund 2019 and optimize Refworld navigation for the end-users by the use of artificial intelligence in order to extract metadata, citations and tags in an automated manner, in particular with regard to

references in case law to other legal and policy documents. In this way, legal teams can find easier access to information and link to other cases.

- Project Type (Status): Minimum viable product (Project Type/Output)
- Project Domain: Human Rights and Rule of Law
- AI Approach: Machine learning, Classification
- Datasets: Case Law documents- Text based data
- Related SDGs: SDG 16.13, SDG 17.18, SDG 10.7
- Project Partners: UNHCR Division of International Protection (DIP), ELCA, USA4UNHCR-TheHive, UNHCR Innovation Service
- Project Website (links): https://medium.com/unhcr-innovation-service/giving-legal-teams-better-tools-to-represent-asylum-seekers-df7802e815df
- Membership or Secretariat-driven: Secretariat-driven
- Resources/Skills: Data Scientist, Data Engineer, UNHCR Protection team, UNHCR IM team
- Technology: Python, Microsoft ML Services

Project 5: Reino

Refworld is a UNHCR repository of legal documentation that contains most of the legal framework on humanitarian affairs and refugee law. Many stakeholders- including legal teams that process refugee sensitive cases- use it as reference for precedents in the law and other court decisions to advance their own legal research. The UNHCR Division of International Protection won UNHCR Innovation Fund 2019 and optimize Refworld navigation for the end-users by the use of artificial intelligence in order to extract metadata, citations and tags in an automated manner, in particular with regard to references in case law to other legal and policy documents. In this way, legal teams can find easier access to information and link to other cases.

- Project Type (Status): Proof of concept (Report)
- Project Domain: Capacity-building
- AI Approach: Machine Learning/Semantic Analysis
- Datasets: Questionnaire responses- text based data
- Related SDGs: SDG 8.3
- Project Partners: UNHCR Innovation Service
- Membership or Secretariat-driven: Secretariat-driven
- Relevant links: Internal. Access to documentation upon request
- Resources/Skills: Innovation Fellows Program Coordinator, Data Engineer
- Technology: Python

Project 6: Sahel Predictive Analytics

The UNHCR Special Advisor on Climate Action presented a proposal to members of the High-level Committee on Programmes regarding engaging in a pilot predictive analytics exercise, which aimed to use data, statistical algorithms and machine learning techniques to identify the likelihood of future outcomes based on historical data. The pilot focused on the United Nations system's shared pressing challenge of tackling the interconnectedness of displacement, climate risks, food insecurity, increased violence and threats to livelihoods in the Sahel region.

- Project Type (Status): Concept not (Other)
- Project Domain: Climate Change

- AI Approach: Predictive Analytics, Simulation or Agent-based modeling (TBD)
- Datasets: Websites, Reports from Reliefweb- text-based data
- Related SDGs: SDG 13 Climate Action
- Project Partners: UNDCO, UNFPA, UNODC West and Central Africa, UN DESA, UNODC, United Nations Convention to Combat Desertification (UNCCD), DPPA, UN-Habitat, UNEP, UNDP, UN Human Rights/OHCHR, OCHA Centre for Humanitarian Data, IOM, WMO, World Bank
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.unsystem.org/CEBPublicFiles/CEB_2019_6%20%28HLCP%2038%29.pdf
- Resources/Skills: Project Lead, Project Coordinator and UN agencies staff
- Technology: Python

Project 7: DEEP.io (inter-agency initiative)

The UNHCR Special Advisor on Climate Action presented a proposal to members of the High-level Committee on Programmes regarding engaging in a pilot predictive analytics exercise, which aimed to use data, statistical algorithms and machine learning techniques to identify the likelihood of future outcomes based on historical data. The pilot focused on the United Nations system's shared pressing challenge of tackling the interconnectedness of displacement, climate risks, food insecurity, increased violence and threats to livelihoods in the Sahel region.

- Project Type (Status): Development (Software product)
- Project Domain: Humanitarian Affairs
- AI Approach: Machine Learning/Classification, NLP techniques
- Datasets: Websites, Reports from Reliefweb- text-based data
- Related SDGs: SDG 16.13, SDG 17.18, SDG 10.7
- Partners: UNHCR, UNICEF, OHCHR, OCHA, Okular Analytics, IDMC, IFRC, iMMAP, JIPS
- Membership or Secretariat-driven: Secretariat-driven
- Relevant links: https://www.thedeep.io/
- Resources/Skills: Inter-agency initiative, data scientist, data engineer, and information management officers
- Technology: Open source, beta version includes machine-learning features (python)

Project 8: Computer Vision Climate Change and Conflict (Partnership with University of Essex)

Inspired by UNHCR Innovation-led and Omdena Foundation challenge, and as a add-on to Project Jetson, the Human Rights, Big Data and Technology (HRBDT) project of the University of Essex is leading on a research using AI for automatic image classification- particularly satellite imagery- to identify drought patterns and conflict patterns in Somalia region. The aim is to be able to prove the correlation of conflict and climate change, by using computer vision analysis.

- Project Type (Status): Data discovery (Research/Study paper)
- Project Domain: Climate Change, Conflict
- AI Approach: Computer Vision
- Datasets: UNOSAT imagery and LANDSAT (NASA)- satellite imagery
- Related SDGs: SDG 16.13, SDG 17.18, SDG 10.7
- Project Partners: University of Essex- the Human Rights, Big Data and Technology (HRBDT), UNHCR Innovation, Omdena Foundation

- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://omdena.com/projects/ai-climate-change/
- Resources/Skills: Omdena Challenge developers, Computer Vision specialist (Post-doc)
- Technology: Python

Project 9: Qualminer Project (UNHCR Ecuador)

UNHCR Ecuador won UNHCR Innovation Fund 2019 and bulit Qualminer. Qualminer explores qualitative indicators from an ActivityInfo database. ActivityInfo is an information management software that can be used for monitoring and evaluation, case management, inter-agency coordination in multiple contexts. This platform is used as the main monitoring system for the Venezuelan Response plan in Ecuador. The QualMiner project explores the qualitative data used for Venezuelan refugee response, particularly regarding project implementation, by applying text analysis (natural language processing) & other AI-based data mining techniques.

- Project Type (Status): Minimum viable product
- Project Domain: Forced Displacement
- AI Approach: Machine Learning/Classification, NLP tecniques
- Datasets: ActivityInfo data- both numeric and text-based adta
- Related SDGs: SDG 16.13, SDG 17.18, SDG 10.7
- Project Partners: UNHCR Ecuador, UNHCR Innovation Service, R GendeR project Ecuador
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://bedatadriven.github.io/QualMiner/
- Resources/Skills: Data scientists, UNHCR IM team, UNHCR Protection

2. Challenges

- Lack of academic research accountability and ethics research on humanitarian decision-making.
- Lack of human rights due diligence and human rights-based impact assessment for AI applications.
- Lack of research on automated decision-making systems (ADMs) and or AI-based systems in humanitarian sector, including those without human supervision and/or oversight, including feedback loops.
- Data literacy: improve data literacy skills across the organization.
- Lack of process-oriented AI applications (producing applications just for the sake of producing them and/or follow the UN system trends).
- Availability of data readiness for A.I. applications (machine-readable data).
- Managing expectations of A.I. uses and applications: not everything is automated and lots of data pre-work is needed. Data literacy: improve data literacy skills across the organization.
- A.I. expertise: improve and introduce A.I. and data science expertise and skills and development of applications for internal uses or to adapt external applications for internal uses for business-as-usual processes/support.
- Implementing standard support structures for A.I.- Organizational culture, more innovative and pushing for change. People cannot implement what they don't fully understand its functioning and there is resistance for implementation.
- Communication issues: to counter negative perceptions of technology.

3. Related Sustainable Development Goals (SDGs)

SDGs 8, 10, 13, 16, and 17

4. Relevant links

- Twitter: @unhcrinnovation
- Medium: https://medium.com/unhcr-innovation-service/artificialintelligence/home
- Website: https://www.unhcr.org/innovation/

Contact information

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United Nations Children's Fund

1. Description of Activities on AI

Project 1: Using human mobility data to create risk maps for the spread of diseases

Creating risk maps for the spread of diseases. This is to help minimise the spread of diseases especially among children.

- Project type (Status): Software product (Development)
- Project Domain: Health
- AI Approach: Image recognition, Capacity Development
- Datasets: Human mobility data and UNICEF data
- Related SDGs: SDGs 1, 2, 3, 4, 5, 6, 9, 10, 13, 16, 17
- Project Website (links): https://www.unicef.org/innovation/fighting-epidemics

Project 2: Using satellite imagery and other data to understand poverty

Poverty reduction through satellite imagery. It Explores the use of satellite images in understanding poverty.

- Project type (Status): Software product (Development)
- Project Domain: Poverty
- AI Approach: Image recognition
- Datasets: Satellite imagery and other data, UNICEF data
- Project Partners: UNDP
- Project Website (links): https://pdfs.semanticscholar.org/9d96/bbd1bab6f66015096336052bd86662e14c6d.pdf
- Challenges: Historic high-resolution satellite imagery is difficult to get when the survey data being used as the ground sample to train the AI model. Scalable and sustainable plan for satellite imagery acquisition is necessary across UN organizations.

Project 3: Together with ESA and WFP, mapping crops in Malawi using drone imagery and AI

Mapping crops in Malawi to improve forecasting agricultural supplies, improve collecting crop production statistics, facilitating crop rotation records, mapping soil productivity, identification of factors influencing crop stress, assessment of crop damage due to storms and drought, and monitoring farming activity.

- Project type (Status): Software product (Development)
- Project Domain: Agriculture

- AI Approach: Image recognition
- Datasets: Drone imagery, UNICEF data
- Project Partners: ESA and WFP
- Project Website (links): https://ui.adsabs.harvard.edu/abs/2018AGUFM.B31I2609K/abstract

Project 4: Mapping the impacts of natural disaster

AI and satellite imagery were used together to assess the impacts of natural disaster such as flood and earthquake in India and Ecuador.

- Project type (Status): Software product (Development)
- Project Domain: Disaster
- AI Approach: Image recognition
- Datasets: Satellite imagery and ground observation data
- Project Partners: ESA, Frontier Development Lab
- Project Website (links): https://fdleurope.org/fdl-europe-2018
- Challenges: Transfer of knowledge through the trained AI model is possible. However, we find it is difficult if ground data in the local context is not available to fine tune the model.

Project 5: Assessing biases in AI for satellite imagery classification

AI algorithms to identify objects in satellite imagery are trained using ground based samples with labels. Biases in the AI arises when such ground based samples are geographically or thematically imbalanced. The project investigate the biases in AI algorithms in popular datasets in terms of accuracy and analyze the potential drivers of such biases using various socio-economic covariants.

- Project type (Status): Research/Study paper (Development)
- Project Domain: Data
- AI Approach: Quantitative analysis, image classification
- Datasets: Satellite imagery and other data, UNICEF data

Project 6: Improving the quality of population data using AI and machine learning

High resolution population data is gaining its importance in data analysis for humanitarian operations. There are several available high resolution population data produced using AI and satellite imagery. This project investigate the errors and biases in those high resolution grid population data sets and develop a method to produce an improved population data set using AI and machine learning algorithms.

- Project type (Status): Software product (Development)
- Project Domain: Population
- AI Approach: Data analysis, algorithm development
- Datasets: Satellite imagery and other data, UNICEF data, existing population data
- Challenges: Ground observation data from developing countries are very scarce and how to gain.

Project 7: Air quality prediction using AI and machine learning

> 500,000 of children under 5 years old died from air pollution related causes in 2016, and millions more suffer from respiratory diseases that affect their development, Children are uniquely vulnerable to air pollution – due both to their physiology, and to the type and degree of their

Exposure. Before and during COVID-19 we see dramatic changes in the air pollution levels in different places which might significantly impact on children's health. In this project, AI model to make predictions of air pollution level using remote sensing data and available ground observations are developed to provide accurate air quality monitoring where the ground observations are rarely available.

- Project type (Status): Software product (Development)
- Project Domain: Air pollution
- AI Approach: Data analysis, algorithm development
- Datasets: Satellite imagery and other data, UNICEF data, ground observation air quality data
- Project Partners: Data Science for Social Good foundation
- Project Website (links): https://www.solveforgood.org/proj/41/

Project 8: Mapping infrastructures using AI and satellite imagery

Information on the locations of infrastructures such as schools and health centers has a great importance in making plans for field operations. School locations are being mapped in this project using AI and high resolution imagery and ground observation gathered from ministry of educations from partner countries and open source data platform such as open street map.

- Project type (Status): Software product (Development)
- Project Domain: Education
- AI Approach: Image recognition
- Datasets: Satellite imagery and other data, UNICEF data
- Project Website (links): https://openaccess.thecvf.com/content_CVPRW_2019/papers/cv4gc/Yi_Towards_equitable_access_to_information_and_opportunity_for_all_mapping_CVPRW_2019_paper.pdf

Project 9: Covid-19 impact analysis using mobile data and AI/machine learning algorithms

Impacts of Covid-19 on how people behave are identified using mobile data and machine learning algorithms. The patterns are analyzed by the different socio- economic groups to gather insights on how people change behavior based on their socio economic status which can provide critical information for the policy making process to improve society's resilience to the pandemic.

- Project type (Status): Research/Study paper (Development)
- Project Domain: COVID-19
- AI Approach: Data analysis, algorithm development
- Datasets: Mobile data, socio-economic data
- Project Website (links): https://www.unicef.org/innovation/magicbox/covid

Project 10: Collaborating with academia to create new techniques that can help reach the most vulnerable children

Ensuring that every child can benefit from the potential of AI by providing young people with the information, skills and services they need to shape the future they want.

- Project type (Status): Training (Other)
- Project Domain: Education Youth Empowerment
- AI Approach: Workshops/Training
- Datasets: Mobile data, socio-economic data

- Project Website (links): https://unicefinnovationfund.org/

Project 11: Responsible Data for Children

It seeks to build awareness regarding the need for special attention to data issues affecting children—especially in this age of changing technology, data linkage and AI; and to engage with governments, communities, and development actors to put the best interests of children and a child rights approach at the centre of our data activities. Drawing upon field-based research and established good practice, RD4C aims to highlight and support best practice in our work; identify challenges and develop practical tools to assist practitioners in evaluating and addressing them; and encourage a broader discussion on actionable principles, insights, and approaches for responsible data management.

- Project type (Status): Full fledged development (Other)
- Domain: Dat
- AI Approach: Guidance, capacity development
- Datasets: Mobile data, socio-economic data
- Partners: GoVLab
- Relevant links: https://rd4c.org/

Project 12: Common messaging on the use of biometrics (Legal Identity Agenda)

UNICEF is currently working with UN partners across the system through a biometrics working group established under the UN Legal Identity Agenda (co-chaired by UNICEF, UNDESA and UNDP). The intent is to work towards a common position/ messaging on the use of biometrics across the broad areas of engagement (legal ID, security, and functional identification/ sectoral systems)- with a view towards developing shared principles.

- Project type (Status): Framework/Strategy/Policy (Development)
- Project Domain: Data and Ethics
- AI Approach: Guidance, capacity development
- Datasets: Mobile data, socio-economic data
- Project Partners: WFP, UNDP, UNFPA, UNHCR, OHCHR, UNCCT, CTED, IOM, UN DESA, UNFPA
- Membership or Secretariat-driven: Membership-driven
- Challenges: Work is ongoing, Initial mapping of standards, issues, and processes underway under a TOR managed by WFP.

Project 13: Guidance on appropriate us of Biometrics

The guidance outlines key questions that should be asked before determining whether the use of biometric technology is appropriate for a proposed program. Covers areas such as the program intent, target audience, data privacy and protection, community sensitivities, and technology performance. Reference: Nicola Richards (2019) Guidance on assessing the value of including biometric technologies in UNICEF-supported programmes, Data and Analytics, UNICEF, NY.

- Project type (Status): Framework/Strategy/Policy (Other)
- Project Domain: Data and Ethics
- AI Approach: Guidance, Screening Tool
- Datasets: Mobile data, socio-economic data
- Project Partners: Internal
- Project Website (links): https://www.data.unicef.org/resources/biometrics/

- Resources/Skills: Guidance Papers
- Technology: Biometric
- Challenges: Although written primarily as an internal document- this may also have value for field partners as an initial decision-making tool. It is very much a first step- to ask "is biometric technology appropriate for my project/ system" and should be complemented by more detailed guidance on implementation (once a decision to proceed is made)- such as that under development by the working group on biometrics under the UN Legal Identity Agenda.

Project 14: Publications and Guidance Related to AI/Big Data/Children

Biometrics and Children: A literature review of current technologies – prepared by UNICEF and the World Bank (Forthcoming), Berman, Gabrielle; Carter, Karen; Garcia Herranz, Manuel; Sekara, Vedran (2020). Digital Contact Tracing and Surveillance During COVID-19. General and child-specific ethical issues, Innocenti Working Papers no. 2020-01, UNICEF Office of Research- Innocenti, Florence Berman, Gabrielle; de la Rosa, Sara; Accone, Tanya (2018). Ethical Considerations When Using Geospatial Technologies for Evidence Generation, Innocenti Discussion Papers no. 2018-02, UNICEF Office of Research - Innocenti, Florence Berman, Gabrielle; Albright, Kerry (2017). Children and the Data Cycle: Rights and Ethics in a Big Data World, Innocenti Working Papers no. 2017-05, UNICEF Office of Research- Innocenti, Florence Berman, Gabrielle; Powell, James; Garcia Herranz, Manuel (2018). Ethical Considerations When Using Social Media for Evidence Generation, Innocenti Discussion Papers no. 2018-01, UNICEF Office of Research- Innocenti, Florence

- Project type (Status): Full fledged development (Report)
- Project Domain: Data and Ethics
- AI Approach: Guidance, capacity development
- Project Partners: Various
- Project Website (links): https://www.unicef-irc.org/article/1809-ethical-research-for-children.html
- Resources/Skills: Guidance Papers

Project 15: UNICEF Policy Guidance on AI for Children

A guide for creating and implementing AI policies and systems that protect children's rights and brings the attention of the public and private sectors to how AI systems impact on children. To develop the guidance over 200 experts have been consulted in 5 regions, and almost 250 children have been consulted on AI issues.

- Project type (Status): Framework/Strategy/Policy (Development)
- Project Domain: Human Rights
- AI Approach: Workshops
- Project Partners: IEEE Standards Association, World Economic Forum
- Relevant links: https://www.unicef.org/globalinsight/featured-projects/ai-children

Project 16: Enhancement of flood early warning system in Malawi

UNICEF is increasingly use geospatial-mapping techniques to predict the flow patterns of floods and the new trajectories of storm zones to help Governments make data backed decisions to re-locate vulnerable populations to higher ground, re-locate schools, health facilities and key infrastructure in the pathways of repeated storms to help keep them out of harms way and operational for the communities.

- Project type (Status): Software Project (Proof of Concept
- Project Domain: Humanitarian

- AI Approach: Statistical Methods
- Datasets: Multispectral and Infrared Imaging (MSIR)
- Related SDGs: SDGS 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 13
- Project Partners: Internal HQs and Regional Offices
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://malawi.4p2c.org/portal/home/index.html

Project 17: Artificial Intelligent solution for skills and job matching

Bashar soft (Vendor) (Wuzzuf/Forasna) has been selected by UNICEF private sector in Egypt Office as the most suitable solution in Egypt and proposal has been received from the company. UNICEF, MOYS (Ministry of Youth and Sports) and basharsoft will work together on the different activities, responsibilities, duties and liabilities on each partner. Bashar Soft will use their strong position in the Egyptian market and their wide database of job seekers and companies to promote the Meshwary program (a national skills development and career guidance programme that has been implemented since 2008 by the Ministry of Youth and Sports (MoYS) with the support of UNICEF) and its values and objectives to relevant job seekers and all hiring companies to increase the awareness about the amount of impact it has on raising employability levels

- Project type (Status): Youth Employability enhancement project (Deployed but not yet integrated with Meshwary)
- Project Domain: Education
- AI Approach: Self-organizing Map
- Datasets: Information Management System (IMS)
- Related SDGs: SDG 4 Quality Education, SDG 17 Partnerships for the Goals
- Project Partners: PFP and ADAP
- Membership or Secretariat-driven: Membership-driven (Driven by PFP section in Egypt Office)
- Project Website (links): https://forasna.com/, https://wuzzuf.net/

Project 18: EQUIST

EQUIST (EQUItable Impact Sensitive Tool) is a powerful web-based analytical platform designed to help decision-makers and programme managers develop strategies to address health system barriers and bottlenecks for achieving health and nutrition outcomes for the most vulnerable children and women.

- Project type (Status): Software Project (Deployed)
- Project Domain: Health, Nutrition
- AI Approach: Statistical Methods
- Datasets: MICS, DHS, SPA, SARA, DHIS2, other surveys
- Related SDGs: SDGs 2, 3, 5, 10
- Project Partners: MICS, DHS, SPA, SARA, DHIS2, other surveys
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): equist.info

Project 19: Targeting HIV interventions for adolescents and young people

Combining traditional and big data sources through novel analytics to prioritize sub-national geographies and segment population 15-24 years, to end HIV among young people.

- Project type (Status): Field implementation (Proof of Concept)
- Project Domain: Health
- AI Approach: Machine-Learning
- Datasets: Multiple- traditional and big data sources
- Related SDGs: SDG 3 Good Health and Well-being
- Project Partners: UNICEF 4 Divisions- Programme, Data & Analytics, Information Communication Technology, Innovation; External- University of Edinburgh, DFID-ONS Data science Hub, Nationwide,
- Project Website (links): https://www.dataforchildrencollaborative.com/hiv

Project 20: UNICEF's Good Governance of Children's Data

Through the initiative a number of papers on emerging AI and data related issues are being written, such as on child rights and data protection by design, state surveillance and responsible group data. for children.

- Project type (Status): Research/Study paper (Development)
- Project Domain: Human Rights
- Project Website (links): https://www.unicef.org/globalinsight/good-governance-childrens-data

Project 21: Automating U-Report helpline responses to increase scale of impact and reduce resource requirements

Increase ability of young people to access accurate and timely information on topics like SRH, MHM, using their own natural language.

- Project type (Status): Software product (Data discovery)
- Project Domain: Could be many domains, likely Health to start
- AI Approach: NLP text classification
- Datasets: U-Report message exchange via U-Partners
- Related SDGs: SDG 3 Good Health and Well-being
- Challenges: Media Monitoring and Population Behavior. During the COVID-19 crisis response, UNICEF is working closely with public institutions in disseminating a health campaign via social and digital media to spread credible and easy to reach awareness on this pandemic. In this regard, it is very important to surf social media to monitor how populations are reacting with the UNICEF campaign and where UNICEF can improve their messages to disseminate better the information, change behaviors and therefore save lives. This comes in handy as well to detect fake news.

Project 22: Classify rumors and misinformation on COVID-19 from multiple sources, and provide debunking information to chatbot users

Increase UNICEF's ability to track COVID-19 related misinformation and develop more accurate solutions for providing debunking facts to chatbot users.

- Project type (Status): Software product (Concept note)
- Project Domain: Health, Education
- AI Approach: NLP text classification

- Datasets: U-Reporters' submitted rumors, UNICEF Facebook Post public comments; potentially other sources
- Related SDGs: SDG 3 Good Health and Well-being
- Project Partners: Internal- U-Report, Digital Platforms Working Group, EMOPS, DOC, Office of Innovation, ICTD, ROs and Cos; External- Data for Children Collaborative, Alana AI"

2. Related Sustainable Development Goals (SDGs)

SDGs 1, 2, 3, 4, 5, 6, 9, 10, 13, 16, and 17

3. Relevant links

https://www.unicef.org/innovation/

Contact information

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United Nations Interregional Crime and Justice Research Institute

1. Description of Activities on AI

Through its specialized Centre for AI and Robotics in The Hague, UNICRI advances understanding on the risks and benefits of AI, robotics and related technologies vis-à-vis crime, terrorism and other threats to security and seeks to support Member States to leverage the potential of these technologies in a responsible manner.

Relying on its convening power as a UN entity, UNICRI organizes several events, including: information-sharing symposiums, technical workshops, training courses, multi-stakeholder policy discussions, and high-level awareness-raising and visibility events. UNICRI is also exploring the conceptual design and development of AI-based tools to, for instance, prevent, detect and facilitate the prosecution of the perpetrators behind online child sexual abuse material and to interpret irregularities in financial transactions that might indicate the financing of terrorism.

The Centre was established by UNICRI in September 2017 with the support of the Municipality of the Hague, the Ministry of Foreign Affairs of the Kingdom of the Netherlands, the Ministry of Interior and Kingdom Relations and strategic partners from the private sector.

Project 1: INTERPOL-UNICRI Global Meetings on AI and Law Enforcement

July 2-4, 2020. Participants from law enforcement agencies of UN and INTERPOL Member States gathered for the second annual INTERPOL-UNICRI Global Meeting on AI for Law Enforcement to discuss AI use cases and technology domains and examine their relevance for law enforcement. The ethical, legal and social implications of the use of AI by law enforcement were also discussed as a central theme of the meeting and the development of a responsible AI innovation toolkit for law enforcement was identified by UNICRI and INTERPOL as a recommended follow-up action.

- Project Type (Status): Event (Recurring annually)
- Project Domain: Law Enforcement, Policy
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: INTERPOL
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://www.unicri.it/news/article/ai_unicri_interpol_law_enforcement

Project 2: Launch of UNICRI's Centre for Artificial Intelligence and Robotics

July 10, 2019. Ambassadors from The Hague-based Embassies, representatives of international organizations and eminent partners from academia and the private sector gathered at the Peace

Palace in The Hague to formally launch the UNICRI Centre for AI and Robotics. The event was organized by the Ministry of Foreign Affairs of the Netherlands, the Municipality of The Hague and UNICRI.

- Project Type (Status): Event (Concluded)
- Project Domain: Crime Prevention
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Ministry of Foreign Affairs of the Netherlands and the Municipality of The Hague
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://www.unicri.it/news/article/Launch_Centre_AI_Robotics

Project 3: Technical Workshop: Deepfakes and Video Manipulations

November 11, 2019. In June 2019, UNICRI presented a challenge on deepfakes at the Hackathon for Peace, Justice and Security. The purpose of this technical workshop is to keep up the momentum after the hackathon and foster further interest in the topic of detecting video manipulations, as well as to further explore avenues for continuing to work on winning solution designed and built at the hackathon. The workshop looked at the current status and prevalence of video manipulations – to understand how major international organizations such as the UN, Europol and NATO are tackling the risks and improper use of video manipulations– and explored the technology behind video manipulation detection, and what we can and should do to make sure video manipulations can be detected and not used improperly.

- Project Type (Status): Event (Concluded)
- Project Website (links)Domain: Crime Prevention, Disinformation
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Website (links)Partners: Europol, NATO, Government of the Netherlands
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://www.unicri.it/news/article-13

Project 4: Training: Artificial Intelligence and the Judiciary: AI Technology Today and Beyond

October 15-16, 2019. This training course, organized in cooperation with the Dubai Judicial Institute and the Government of Dubai, sought to enhance judicial knowledge on artificial intelligence. The course focused on issues such as the legal definition of AI, the dangers and realities of algorithmic and output bias, the attribution of responsibility in cases where harm is done by an AI system, and specific AI applications that can support the judiciary in the performance of its duties. The course was attended by more than 100 participants from the UAE, as well as by representatives from 12 members of the Euro-Arab Judicial Network.

- Project Type (Status): Training (Concluded)
- Project Domain: Justice
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Dubai Judicial Institute and the Government of Dubai
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://www.unicri.it/news/article-1

Project 5: Roundtable: Decoding Biases in AI: Does AI have a Diversity Problem?

January 21, 2020. Bringing together academia, policymakers and the private sector, this roundtable discussed the social impact of artificial intelligence, diversity in the tech sector and whether it is possible to build fair algorithms. The roundtable was organized by the T.M.C. Asser Institute, the

Embassy of Switzerland to the Kingdom of the Netherlands and UNICRI in coordination with the International Gender Champions Den Haag.

- Project Type (Status): Event (Concluded)
- Domain: Gender Balance, Equality
- Related SDGs: SDG 5 Gender Equality, SDG 16 Peace, Justice and Strong Institutions
- Partners: T.M.C. Asser Institute, the Embassy of Switzerland to the Kingdom of the Netherlands
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.asser.nl/education-events/events/?id=3104

Project 6: Panel Discussion at Davos: The Role AI can Play in Stopping the Online Sexual Abuse of Children

January 23, 2020. UNICRI, the Bracket Foundation and Interfaith Alliance for Safer Communities (IAFSC) organized a panel discussion at Davos on the role technology can play in stopping the online sexual abuse of children organized. Questions regarding the potential of advances in technology to reduce abuses such as the online spreading of child sexual abuse and exploitation material were discussed, as well what kind of new tools law enforcement could rely on to prevent and counter these crimes through the identification of victims and perpetrators.

- Project Type (Status): Event (Concluded)
- Project Domain: Crime Prevention, Child Protection
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: The Bracket Foundation, IAFSC
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://www.unicri.it/news/article-32

Project 7: Virtual Discussion Room on COVID-19: How Can AI Support Law Enforcement?

May 13, 2020. INTERPOL and UNICRI organized a Virtual Discussion Room focused on the role AI can play in supporting law enforcement to preserve public safety and social order during the COVID-19 pandemic, as well as contain the spread of the virus. During this event the second report on AI for law enforcement “towards responsible AI innovation” was launched.

- Project Type (Status): Event (Concluded)
- Project vDomain: Crime Prevention, Health
- Related SDGs: SDG 3 Good Health and Well-being, SDG 16 Peace, Justice and Strong Institutions
- Project Partners: INTERPOL
- Membership or Secretariat-driven: Secretariat-driven

2. Description of Possible Projects on AI

Project 1: Working with law enforcement to build capacities for the use of AI to combat online child sexual abuse material

2020-2022. This proposed project will seek to tackle to the surge in online child sexual abuse material driven through the joint exploration of new technological solutions, specifically AI and machine learning, together with law enforcement agencies.

- Project Type (Status): Software/Product (Concept Note)
- Project Domain: Crime Prevention, Child Protection
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: The Bracket Foundation, the Government of the United Arab Emirates
- Membership or Secretariat-driven: Secretariat-driven

Project 2: INTERPOL-UNICRI 3rdGlobal Meetings on AI and Law Enforcement

November 23-27, 2020. Representatives from law enforcement agencies of UN and INTERPOL Member States will gather for the third annual Global Meeting on AI for Law Enforcement to discuss latest trends and developments and share experiences. The theme of the third Global Meeting shall be "Galvanizing momentum for responsible AI" and, in this regard, the meeting will serve as platform to obtain essential feedback from participants on the direction, nature, structure and content of the Responsible AI Innovation Toolkit for Law Enforcement to be development in 2021.

- Project Type (Status): Event (Recurring (annually)
- Project Domain: Law Enforcement, Policy
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: INTERPOL
- Membership or Secretariat-driven: Secretariat-driven

Project 3: AI in Africa –Virtual Technical Workshop

TBC September, 2020. Through this virtual technical workshop, UNICRI and Technology Against Crime (TAC) in Africa, in collaboration with key representatives from African Member States, will seek to explore, new and emerging threats associated with AI and crime, as well as the role or possible role of AI in crime prevention in Africa and the state of AI-readiness of law enforcement communities in Africa. In doing so UNICRI and TAC Africa will endeavour to identify local priorities and concerns in this regard.

- Project Type (Status): Event (Development)
- Project Domain: Crime Prevention, Digital Divide
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Technology Against Crime in Africa
- Membership or Secretariat-driven: Secretariat-driven

Project 4: AI in Latin America –Virtual Technical Workshop

TBC October, 2020. Through this virtual technical workshop, UNICRI and C-Minds, in collaboration with key representatives from Latin American countries, seek to explore, new and emerging threats associated with AI and crime, as well as the role or possible role of AI in crime prevention in Latin

America and the state of AI-readiness of law enforcement communities in Latin America. In doing so UNICRI and C-Minds will endeavour to identify local priorities and concerns in this regard.

- Project Type (Status): Event (Development)
- Project Domain: Crime Prevention, Digital Divide
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: C-Minds
- Membership or Secretariat-driven: Secretariat-driven

Project 5: AI for Good webinar

TBC 2020. Through the AI for Good platform, UNICRI plans to host a webinar aimed at raising awareness amongst the international community of the role that the responsible of use of AI by law enforcement can play in safeguarding children from a wide range of forms of violence, exploitation and abuse and to stimulate thought on possible future use cases.

- Project Type (Status): Event (Concept Note)
- Project Domain: Crime Prevention, Child Protection
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: ITU
- Membership or Secretariat-driven: Secretariat-driven

Project 6: University of Tokyo webinar

TBC 2020. In cooperation with the University of Tokyo, UNICRI seeks to explore, new and emerging cyber threats associated with AI, as well as the role or possible role of AI in crime prevention in Japan.

- Project Type (Status): Event (Concept Note)
- Project Domain: Crime Prevention
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: University of Tokyo
- Membership or Secretariat-driven: Secretariat-driven

Project 7: Artificial Intelligence – Criminal Uses and Abuses

TBC Quarter 3 2020. Report by UNICRI, Europol and TrendMicro identifying and analyzing current uses and abuses of AI for criminal purposes, trends in underground forums and possible future scenarios involving the criminal use and abuse of AI. The report also includes a deep dive into the criminal use of deepfakes and related manipulation technologies.

- Project Type (Status): Report (Development)
- Project Domain: Crime
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Europol, TrendMicro
- Membership or Secretariat-driven: Secretariat-driven

Project 8: Special Collection on Artificial Intelligence

17 August 2020. Journal collecting a selection of articles from innovative minds in academia examining a range of issues related to crime prevention and criminal justice in an artificial intelligence-enabled future. The objective of the collection is to stimulate discussion in this domain and on how to shape

the design of the policies and legal frameworks of the future and provide guidance to those who will build the AI-based tools and techniques in question.

- Project Type (Status): Journal (Development/Recurring (annually)
- Project Domain: Law, Policy, AI Governance
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Membership or Secretariat-driven: Secretariat-driven

Project 9: Responsible AI Innovation Toolkit for Law Enforcement

TBC 2021. During the 2019 Global Meeting on AI for Law Enforcement, UNICRI and INTERPOL identified the need for develop operationally oriented support and guidance for law enforcement in the design, development and deployment of AI in a responsible manner. In this regard, the development of a toolkit for responsible AI innovation in law enforcement has been identified by UNICRI and INTERPOL as a valuable and constructive approach to providing such support and guidance. The Toolkit will be developed with a 'bottom up' design, relying on expertise and insights from the end-user community.

- Project Type (Status): Framework/Strategy/Policy (Concept Note)
- Domain: Law Enforcement, Policy
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Partners: INTERPOL, European Commission
- Membership or Secretariat-driven: Membership-driven

3. Challenges and Opportunities

- **Challenges:** Ensuring human rights complaint AI and building public trust in the use of AI by law enforcement have been and continue to be the primary challenges UNICRI faces in terms of the use of this technology for crime prevention. This is relevant now more than ever in light of numerous recent developments, including privacy law violations against private entities supplying facial recognition software to law enforcement, concerns regarding accuracy and racial discrimination in the use of facial recognition software, racial equality movements following the death of George Floyd in the United States and the related anti-policing sentiment. A further challenge UNICRI has faced in terms of exploring the development of practical AI applications for crime prevention as part of pilot projects concerns access to data. The data required is often sensitive in nature due to both privacy and security concerns, which creates legal hurdles. Often data is linked to ongoing investigations which can equally limit access.
- **Opportunities:** As criminal investigations become increasingly data heavy and as law enforcement are being asked to maintain operations, or even do more, with less, AI can be a powerful tool in supporting law enforcement to continue to prevent and control crime if the appropriate conditions are in place. There are numerous unexplored opportunities for employing AI to prevent crimes.

4. Related Sustainable Development Goals (SDGs)

SDG 16 Peace, Justice and Strong Institutions

5. Relevant links

- UNICRI AI web page – http://unicri.it/topics/ai_robotics
- UNICRI-INTERPOL Report – AI and Robotics for Law Enforcement - http://unicri.it/new-report-artificial-intelligence-and-robotics-law-enforcement

Contact Information

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United Nations Institute for Disarmament Research

1. Description of Activities on AI

Project 1: Security and Technology – AI and Autonomy Workstream

The UNIDIR Security and Technology Programme's AI and Autonomy workstream conducts original research and convenes international events to promote a fact-based, technologically sound dialogue between policymakers, the tech community, the private sector and other stakeholders working on AI technology and its implications for security. This project directly supports the Convention on Certain Conventional Weapons Group of Government Experts on Emerging Technologies in the Area of Lethal Autonomous Weapon Systems in its efforts to advance multilateral debate on concepts such as human control and responsibility, the human-machine interface, and the predictability and reliability of AI-enabled conventional weapon systems (among other considerations). This project also seeks to address considerations related to broader applications for AI in military systems—particularly in decision-making support tools, cyber operations, and nuclear command and control— which themselves raise novel concerns about understandability, reliability and predictability; the potential for unintended interactions or outcomes; and susceptibility of these systems to manipulation. The rate of technological progress in this space requires, as the Secretary-General has described it, a "broader consideration of the impacts of introducing autonomy and artificial intelligence into other military systems, and how effective governance and risk mitigation can be achieved". The implications of AI for digital, physical and even political security require a fundamental reassessment and, in some instances, re-equipping of the multilateral arms control toolbox. In the period 2019–2021, UNIDIR's AI and autonomy workstream will seek to a) support understanding of the implications of autonomy in weapon systems and b) explore the options available for AI arms control.

- Project Type (Status): Framework/Strategy/Policy, Research (Fully fledged Development)
- Project Domain: Peace and Security, Lethal Autonomous Weapon Systems
- AI Approach: Research, events
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Technology and academic research community, arms control practitioners and other experts in regulatory and technology control policies.
- Project Website (links): https://unidir.org/programmes/security-and-technology

2. Description of Possible Projects on AI

- Future work will encompass research studies and events at the regional and international level on the science, significance, and solutions related to artificial intelligence and the weaponization of increasingly autonomous technologies. This research agenda and program of convenings will form a fundamental part of UNIDIR's efforts in support of the Group of Governmental Experts

on Emerging Technologies in the Area of Lethal Autonomous Weapon Systems, as well as other stakeholder communities.

3. Challenges and Opportunities

- **Challenges:** complexity and constant evolution of the research domain, uncertainties regarding possible future applications of military AI, low technological literacy of many policy makers and a reluctance to adopt multistakeholder approaches (particularly in cooperation with the private sector and technical community) to international security challenges
- **Opportunities:** demand is high for UNIDIR primers, briefings and events, such as the Innovations Dialogue (https://unidir.org/events/2020-innovations-dialogue) where we seek to create spaces to build knowledge, raise awareness among policy makers and convene multi-stakeholder discussions on new technology issues, as mandated by the Secretary-General in his Agenda for Disarmament.
- **Lessons learned:**
  - Need and demand for focused research on specific topics, clarification of the scope and exact meaning of broadly used terms or concepts, as well as description of process pertaining to the use of AI in the framework of military operations or the weaponization of AI.
  - The multi-stakeholder approach continues to be valuable for finding common ground and engendering constructive approaches among stakeholders holding divergent or competing points of view.
  - Neutral expert analysis is very much welcomed by stakeholders and policy makers.

4. Related Sustainable Development Goals (SDGs)

Goal 16: Peace, Justice and Strong Institutions

Contact information

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United Nations Industrial Development Organization

1. Description of Activities on AI

As a leading UN agency with a mandate to foster inclusive and sustainable industrial development (ISID), UNIDO leads the way in addressing opportunities, challenges and risks stemming from the 4IR and how these can affect inclusive and sustainable industrial and economic development. The Organization aims to enable a smooth transformation towards the 4IR for countries with different levels of economic development, ensuring that no one is left behind. Making the 4IR work for all should be the key driver of technological development policy and action.

Project 1: Strengthening Industry 4.0 technologies in Morocco

During the 2017 UNIDO General Conference it was announced that Morocco would be the first Arab nation to participate in the organization's flagship initiative – the Programme for Country Partnerships. The PCP is UNIDO's innovative model for accelerating inclusive and sustainable industrial development and attainment of SDG 9 in Member States. High impact industrial development is achieved through the PCP via the alignment with national development agenda goals and focus on sectors with high growth potential. A key characteristic of the PCP is the emphasis placed on multi-stakeholder partnership led by the host government – to promote synergistic industrial development. Further, the PCP has been designed to leverage additional investment in selected priority sectors. As such, it facilitates the mobilization of partners and resources to achieve larger development impact. The Kingdom of Morocco informed UNIDO that the PCP should focus on the following areas: a) Agro-value chain development; b) Industrial Parks; c) Renewable Energy & Energy Efficiency; d) Industry 4.0; e) E-commerce.

The main goal of the Industry 4.0 project is to support Morocco in the shaping and consolidation of a digital economy ecosystem through the implementation of Industry 4.0 technologies and Additive Manufacturing.

- Project Type (Status): Institution building (Full fledged development, Project Document approved by UNIDO Executive Board. Currently engaging with donors and implementation is expected to commence Q4 2020/Q1 2021)
- Expected outcome:
  - Establishment of a national new generation of Smart factory
  - Development of an Industry 4.0 integration platform for national cooperation and coordination for all activities related to promoting Industry 4.0 development
  - Future of Industrial Skills Curriculum- Industry 4.0
  - Develop a network of development finance institutions and other actors for mobilizing funds, promoting innovative business partnerships and leveraging resources to support the SMEs.
- Project Domain: Industrialization
- AI approach: Automation/Smart Technology

- Related Sustainable Development Goals: SDG 9, SDG 8 and SDG 17
- Project Partners: Morocco Digital Development Agency, Confederation of Moroccan Enterprises (CGEM), Moroccan Foundation for Advanced Science, Innovation and Research (MASCIR), Moroccan Aerospace Industries Association (GIMAS), Moroccan Institution for Support to Microenterprise (INMAA), MAROC PME
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.unido.org/programme-country-partnership

Project 2: Quality Infrastructure for Trade Facilitation (QI4TF) Toolkit builds on AI to prioritize technical interventions.

The Quality Infrastructure for Trade Facilitation (QI4TF) Toolkit was developed by UNIDO with the support of BMZ (the German Federal Ministry of Economic Cooperation and Development). It helps countries to systematically identify technical gaps to improve the quality infrastructure system (QIS) required to facilitate trade through the application of an electronic toolkit (e-tool). The e-tool is applied in a workshop setting with stakeholders from industry and government. These stakeholders first have to identify gaps within their QIS that hinder trade facilitation and subsequently agree on the prioritization of key activities.

The e-tool has a total of 93 questions, which have 6 possible choices as a response. This means that the variables and possible combinations of responses are millions. Artificial intelligence (AI) and machine learning algorithms will make it easier to analyze these responses at a faster rate and prioritize them, so that industry and government stakeholders can know what the most important gap is in terms of improving quality infrastructure for trade facilitation. As a result, the stakeholders are able to identify the actions needed to bridge these gaps, and so develop a consensus-built roadmap to plan and kick-start actions that will allow the smooth flow of goods across borders. Every single time the e-tool is applied data is generated and analyzed, the proposed AI algorithm aims to learn to mimic human behavior and becomes more adept at prioritizing the activities needed to improve quality infrastructure for trade facilitation. The result is that decision-making at the government and industry level becomes easier.

Project implementation started in March 2017 and the project was completed in January 2020. A programme concept was developed to scale the e-tool further to incorporate machine learning and big data.

- Project Type (Status): Tool (Proof of Concept)
- Project Domain: Trade
- AI approach: Machine Learning, Big Data
- Datasets: SQL-based dataset
- Related Sustainable Development Goals: SDG 8, SDG 9
- Project Partners: Government of Philippines; Representatives from Academia in the Philippines
- Membership or Secretariat-driven: Membership-driven

Project 3: Accelerating industrial development in select sectors through Industry 4.0

Developing countries and economies in transition must be made aware of implications and challenges related to this paradigm shift, and India is no different. Several companies in developing countries, including in India, have started full or partial implementation of Industry 4.0. However, such implementation is fraught with challenges, both in terms of macro- and meso-level conditions that need to be in place, which include, amongst others, industrial policies, hard and soft infrastructure, support institutions, appropriately skilled labour, sufficient flow of innovation and investment, as well as, at the micro-level, preparedness of industries themselves. Additionally, there are implications and

challenges for Indian industry as a result of implementation of Industry 4.0 in advanced economies, namely, how it impacts global value chains, competitiveness and jobs in India. Other consequences relate to reversed flows of Foreign Direct Investment (FDI) and a further manifestation of an already widening technology gap.

Consequently, in order to address the afore mentioned the overall objective of the proposed project is to accelerate inclusive and sustainable industrial development of the automotive and textile sectors through adoption of Industry 4.0, and thereby contribute to increased productivity and competitiveness. An immediate objective of the project is to prepare these the automotive and textile sectors for implementation of Industry 4.0, as well as for the implications of other countries' implementation of the same.

- Project Type (Status): Industry 4.0 Observatory and advisory boards, Analytical framework for Industry 4.0 preparedness (Under review)
- Project Domain: Technology adoption, skills development and policy.
- AI approach: Automation and smart Manufacturing
- Datasets: Information gained from mapping and measuring the requisite sectorial systems of innovation (UNIDO ongoing project)
- Related Sustainable Development Goals: SDG 9 Industry, Innovation and Infrastructure
- Project Partners: Indian Institute of Technology Delhi (IITD-AIA-FSM)
- Membership or Secretariat-driven: Membership-driven

Project 4: Leveraging the Fourth Industrial Revolution technologies for Inclusive and Sustainable Industrial Development in the Philippines

The project builds the blocks that allow for better understanding the requirements for the successful uptake of 4IR technologies (such as IAI) and business models in the Philippines' industrial sector context. To this end, the project assesses preparedness of the Philippines industry for uptake of 4IR technologies focusing on food, automotive, semi-conductor, electronics and aerospace industrial sector; develops roadmaps for industrial upgrading and modernization through the uptake of 4IR technologies in the selected industrial sectors; builds the industrial innovation ecosystem in food, automotive, semi-conductor, electronics and aerospace industrial sector; prepares feasibility study for pilot, demonstration and learning factory; establishes an academy and innovation center for small and medium-sized enterprises (SMEs) with focus on the above-mentioned priority industries, and produces and roll out an 4IR awareness and capacity building program for government officials and staff, industry associations and business development services providers.

- Project Type (Status): Institution building (Pending, approval by the Government of Philippines)
- Project Domain: Industrialization. Innovation Ecosystem building
- Related Sustainable Development Goals: SDGs 8, 9, 10, and 11
- Project Partners: Government of Philippines, Representatives from Academia in the Philippines
- Membership or Secretariat-driven: Membership-driven

Project 5: Leveraging the potential of Fourth Industrial Revolution technologies for smart manufacturing and ISID in Belarus

The Ministry of Economy of the Republic of Belarus requested UNIDO to develop a project to promote innovation and smart manufacturing through establishing demonstration and innovation centers for the fourth industrial revolution (4IR) technologies in three regions of the Republic of Belarus: Brest, Vitebsk and Mogilev. In response to the request and in the framework of the preparatory assistance (PA) phase, UNIDO developed a project to establish a pilot demonstration and innovation center for the fourth industrial revolution (4IR) technologies and business models in the Brest region of Belarus.

The Brest 4IR Demonstration and Innovation Center (BDIC) will support SMEs 'smart manufacturing technological learning and innovation and will involve beneficiaries from the Vitebsk and Mogilev regions, as well as representatives from other countries in the Eurasian Economic Union (EAEU). The BDIC is expected to evolve into an innovation hub, promoting effective interactions between national and regional governments, industry and academia and fostering regional innovation system and business ecosystem development.

The project seeks to contribute towards ensuring smooth transformation of the Republic of Belarus to 4IR era and to fostering ISID in the country and the EAEU, by addressing the following challenges:

- Lack of awareness on the affordable, state-of-the-art, 4IR technologies, technological systems and business models.
- Barriers and obstacles for uptake for 4IR technologies, technological systems and business models.
- Lack of adequate human skills
- Lack of rules, regulations, standards and systems of incentives related to advanced digital technologies
- Weak innovation and business ecosystems for fostering the uptake of 4IR technologies
- Lack of advanced infrastructure for 4IR technologies uptake.

  – Project Type (Status): Institution building (Approved by the EB)
  – Project Domain: Innovation Ecosystem building
  – Related Sustainable Development Goals: SDGs 8, 9, 10, and 11
  – Project Partners: "Smart Brest" Institution for Science and Innovations, "Brest Science and Technology Park" CJSC, "Brest State Technical University" EI
  – Membership or Secretariat-driven: Membership-driven

Project 6: Promoting smart manufacturing through innovation system building in Serbia

The Ministry of Innovation and Technological Development of the Government of Serbia, in its letter of 24 October 2019, requested UNIDO to explore the opportunities and modalities of cooperation to accelerate the digital transformation of Serbian society through innovation and technological development. Following funds mobilization efforts and consultations with the Government of Slovenia and the Slovene Enterprise Fund on 5th December 2019 and 29th January 2020, the Slovenian Government expressed its interest to fund this technical cooperation project. In consultation with representatives of University of Belgrade, Faculty of Mechanical Engineering, Department of Manufacturing Engineering; the University of Novi Sad, Faculty of Technical Sciences and the Ministry of Innovation and Technological Development of the Republic of Serbia on the above government request to UNIDO, this project document was developed.

The project objective is fostering smart manufacturing in Serbia through building innovation and business ecosystems for uptake (adopt, adapt and diffuse) of advanced digital technologies and materials, and for enhancing manufacturing competitiveness.

The project will establish a pilot Smart Manufacturing Innovation Centre (SMIC). The pilot SMIC will raise awareness on the opportunities and challenges of the fourth industrial revolution (4IR) technologies for Serbian small and medium-sized enterprises (SMEs), and will serve as an innovation hub and a centre of competence for advanced 4IR technologies in manufacturing. The SMIC will provide demonstration facilities on advanced digital technologies and new materials; tools for the assessment of readiness for digitalization in manufacturing and skill-building; technical services and shop floor assistance on Lean Management and Lean 4.0 Management for process optimization; and training packages on digitalization and automation in specific industrial sectors as well as on business environment for StartUps and ScaleUps in innovative digital technologies and smart materials.

– Project Type (Status): Institution building (Development)

- Project Status: Innovation Ecosystem building
- Related Sustainable Development Goals: SDGs 1, 5, 8, and 17
- Project Partners: University of Novi Sad, Faculty of Technical Sciences
- Membership or Secretariat-driven: Membership-driven

Project 7: Building the capacity for the uptake of Industry 4.0 in Vietnam

The overall purpose of the intended project is to assist the Government of Viet Nam (GoV) to build the capacity to prepare for Industry 4.0. This will include preparation of the manufacturing sector (micro) as well as its macro and meso level support institutions. Preparation involves the country's own adoption of Industry 4.0 and its ability to react and act on implementation of Industry 4.0 globally. Suitable manufacturing sectors for capacity building will be identified during the fact-finding mission. Moreover, the intended project purports to identify the new required worker profile and address the need for re-training and re-skilling of workers, as well as provision of relevant training, in identified manufacturing sectors.

- Project Type (Status): re-training and re-skilling of workers, as well as provision of relevant training (concept note)
- Project Domain: Industry 4.0 – manufacturing sector
- Related Sustainable Development Goals: SDGs 9, 8 and 17
- Project Partners: Ministry of Industry and Trade (line ministry), Ministry of Education and Training, Ministry of Science and Technology
- Membership or Secretariat-driven: Membership-driven

Project VII: Strengthening capacity for operation and maintenance with Internet of Things technologies for Olkaria geothermal power station complex in Kenya

Kenya has one of the largest geothermal potential for electricity production in the region, yet, the country faces serious barriers that hinder the exploitation of geothermal resources. Among the most commonly recognized there are long gestation period, capital intensity and high risk in exploration phase. There is also a vast potential for improvements of energy management and applications of innovative, advanced technologies in order to increase access to stable electricity, improve operations of existing installations as well as enhancing local and institutional capacities. Management of the facility including reservoir management constitutes the foundation of the operations of a geothermal power plant. In the case of geothermal power station complex, introduction of Internet of Things (IoT) technology has a significant potential to improve its efficiency and lead to direct improvement of the Operation and Maintenance (O&M) capabilities.

The project will be implemented in close collaboration with Japan International Cooperation Agency (JICA). Their respective roles will be split between project components. JICA will focus on Component A which focuses on providing expert training, advice and capacity building. Japanese experts are expected to train Olkaria staff to develop O&M capacity. Component B, to be executed by UNIDO, focuses on the introduction of IoT technologies and training for staff to use the IoT technologies installed. UNIDO will facilitate advisory and technical assistance to foster clean energy development and build the necessary human capacity. Component A will be implemented on the premise of the IoT technologies installed under Component B.

Thus, the project aims to overcome the barriers related to the capacity strengthening of O&M with IoT technologies for existing geothermal installations. Also, the project will demonstrate, deploy and

transfer IoT technologies from Japan to Kenya and will create a favorable environment to deploy such technologies through development of business models.

- Project Type (Status): re-training and re-skilling of workers, as well as provision of relevant training (Development)
- Project Domain: Sustainable energy
- AI Approach: The project activities are focused on IoT technology design and installation at Olkaria complex to enhance the O&M capabilities of the geothermal power plants; technical training and awareness raising with regard to installed IoT technologies.
- Datasets: Geothermal power plant O&M related data.
- Related Sustainable Development Goals: SDGs 7, 9 and 13
- Project Partners: Kenya Electricity Generating Company, Ministry of Industrialization, Trade and Enterprise Development of Kenya, Ministry of ICT, Innovation and Youth Affairs of Kenya, Ministry of Energy of Kenya, The National Treasury of Kenya, Japan International Cooperation Agency, Yokogawa Electric
- Membership or Secretariat-driven: Membership-driven

2. Challenges and Opportunities

- **Challenges** to the organization is the exponential progress of 4IR technological change. Keeping up with technological developments during the design and implementation phases of a project is a challenging task every time a new request is being submitted.
- **The opportunities** make those challenges worth the effort. Digital maturity and 4IR maturity and readiness in general, are well received where use cases are established and demonstrated. The follow up demand for continuous improvement on a technology and equipment level, are testimony to the topical work UNIDO provides.

3. Related Sustainable Development Goals (SDGs)

SDGs 7, 9, 11, 12, and 16

4. Relevant links

https://www.unido.org/sites/default/files/files/2020-07/UNIDO_COVID_Digital_Transformation_0.pdf

https://www.unido.org/sites/default/files/files/2020-06/UNIDO_4IR_Strategy_Discussion_Paper.pdf

https://www.unido.org/sites/default/files/files/2020-01/Convergent_tech.pdf

https://tii.unido.org/sites/default/files/publications/Unlocking%20the%20Potential%20of%20Industry%204.0%20for%20Developing%20Countries.pdf

https://tii.unido.org/sites/default/files/publications/UNIDO%20Conformity%20Assessment_Brochure_2020.pdf

https://tii.unido.org/sites/default/files/publications/ITM2019_Report_English%20WEB.pdf

https://www.unido.org/sites/default/files/files/2020-03/International%20Conference%20on%20Ensuring%20Industrial%20Safety_03.03.20.pdf

https://tii.unido.org/sites/default/files/publications/Unido_BRI_summary_web.pdf

https://roscongress.org/en/news/gmis-2019-participants-discuss-use-of-ai-in-manufacturing-sector/

https://www.gmisummit.com/gmis-2019/knowledge-hub/battling-covid-19-with-artificial-intelligence/

https://www.gmisummit.com/gmis-2019/gmis2019-outcomes/

https://www.lrfoundation.org.uk/en/news/increased-focus-cybersecurity-puts-human-safety-risk/

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United Nations Institute for Training and Research

1. Description of Activities on AI

UNITAR has multiple activities of interest within the areas of artificial intelligence and satellite imagery analysis that will further progress to the Sustainable Development Goals (SDGs). Since 2000, UNITAR has developed its Operational Satellite Applications Programme (UNOSAT), which has focused on satellite imagery analysis in support of UN-related operations within the areas of disaster response, human rights, security, and development, and capacity development within these areas. This has allowed UNOSAT to develop decades of in-house expertise in satellite imagery analyses on issues vital to UN operations. Just as important, UNOSAT has for many years produced a robust collection of vector datasets with its analysis results that prove extremely useful as training data for AI and related development. Much of the success of UNOSAT computing activities result from excellent major collaborations with CERN Openlab and UN Global Pulse, UNICEF Innovation, UNHCR Innovation, ITU, and other partners.

UNOSAT projects in development in these thematic areas include the development of specific algorithms as well as tool development for analyzing satellite imagery across the UN system. These different aspects are described in greater detail below.

Project 1: Algorithm development

With decades of experience analyzing satellite imagery and mapping natural disasters, refugee settlements, conflict, and related issues UNOSAT has emerged as a primary partner for organizations wishing to explore AI for humanitarian applications. In addition, large amounts of UNOSAT analyses are publicly available in vector format both from its' website and the Humanitarian Data Exchange, and this has proven valuable for organizations seeking training data for AI development. In turn, multiple such organizations have reached out to UNOSAT for guidance on imagery analysis, allowing UNOSAT to learn a great deal about the state of the field. This partnership model has been very effective in particular with UN Global Pulse and the two organizations have collaborated extensively to develop algorithms that can identify and map refugee shelters in satellite imagery. Importantly, UNOSAT and Pulse have paid particular attention to the accuracy of outputs of these algorithms given the high-threshold of accuracy UNOSAT requires for its operations. This process and results were detailed in a 2018 academic paper by Pulse and UNOSAT. Currently, UNOSAT also developed an end-to-end pipeline where images of flood-prone areas are automatically downloaded from satellites covering the affected areas and processed by machine learning algorithms to shorten the time needed to deliver disaster maps to humanitarian organizations. The system would allow for near-real-time monitoring and surveillance. UNOSAT is also pursuing algorithm development for change detections which would help enable various analyses such as landslide detection and damage assessments. Finally, UNOSAT together with CERN and European Space Agency will engage in a challenge over the next several months to extract building footprints from satellite imagery.

- Project Type (Status): Software product (Development)
- Project Domain: GIS

- AI Approach: Imagery recognition
- Datasets: Satellite images
- Project Partners: CERN Openlab, European Space Agency, UN Global Pulse, UNICEF Innovation, UNHCR Innovation, ITU, and other partners.
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://royalsocietypublishing.org/doi/10.1098/rsta.2017.0363 (Nemni E, Bullock J, Belabbes S, Bromley L. Fully Convolutional Neural Network for Rapid Flood Segmentation in Synthetic Aperture Radar Imagery. Remote Sensing, MDPI (2020)
- Resources/Skills: Programming proficiency/strong technical understanding of AI project methodology

Project 2: Tool development

Concurrently with algorithm development UNOSAT and Pulse are working to develop a cloud-based infrastructure for processing and analyzing satellite imagery using AI models. This tool is in an 'early beta' phase and has been shared with a few UN partners for testing. UNOSAT is providing feedback on usability from the perspective of an 'expert GIS' user. Eventually this tool is intended to provide access to large amounts of satellite imagery as well as AI-based analysis methods for the UN community to use without requiring any specialized hardware or software themselves.

- Project Type (Status): Software product (Development)
- Project Domain: GIS
- AI Approach: Imagery recognition
- Datasets: Satellite images
- Project Partners: CERN Openlab, European Space Agency, UN Global Pulse, UNICEF Innovation, UNHCR Innovation, ITU, and other partners.
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.mdpi.com/2072-4292/12/16/2532/htm
- Resources/Skills: Programming proficiency/strong technical understanding of AI project methodology
- Technology: Arcgis Dashboard (for visualisation of AI results)

2. Description of Possible Projects on AI

UNOSAT has a large 'toolkit' of analytical methods that it has developed and used over it's history, and eventually almost all of these analysis methods could be candidate for AI model development. Additionally, UNOSAT would prefer to pursue the wider issue of tracking algorithm development and applications to the SDGs as discussed in the 2019 AI for Good summit.

3. Challenges and Opportunities

UNOSAT together with its partners has made quite impressive progress on developing AI methods for satellite imagery analysis, but additional funding is needed in order to scale up the efforts, which would likely achieve amazing results. The before mentioned training data coupled with in-house expertise and understanding of requirements are the basis for excellent opportunities in advancing AI for satellite imagery analysis.

4. Related Sustainable Development Goals (SDGs)

SDGs 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, and 17..

5. Relevant links

- A paper published jointly by UNOSAT and UN Global Pulse is here: https://royalsocietypublishing.org/doi/10.1098/rsta.2017.0363
- Fully Convolutional Neural Network for Rapid Flood Segmentation in Synthetic Aperture Radar Imagery. Remote Sensing, Nemni E, Bullock J, Belabbes S, Bromley L.,MDPI (2020) https://www.mdpi.com/2072-4292/12/16/2532

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United Nations Office for Disarmament Affairs

1. Description of Activities on AI

Project 1: CCW Group of Governmental Experts on emerging technologies in the area of lethal autonomous weapons systems

The Office for Disarmament Affairs (ODA) supports the work of the Convention on Certain Conventional Weapons (CCW) Group of Governmental Experts on emerging technologies in the area of lethal autonomous weapons systems (LAWS). The Group has affirmed eleven guiding principles covering, inter alia, the applicability of international humanitarian law, the retention of human responsibility and that human-machine interaction should ensure LAWS are used in compliance with international law. In 2019, CCW High Contracting Parties mandated the Group to explore and agree on possible recommendations on options related to emerging technologies in the area of lethal autonomous weapons and to report to the Sixth Review Conference of the CCW in 2021.

- Project Type (Status): intergovernmental meeting (Ongoing)
- Project Domain: peace and security, legal, humanitarian
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://meetings.unoda.org/meeting/group-of-governmental-experts-gge-on-emerging-technologies-in-the-area-of-lethal-autonomous-weapons-systems-laws/

Project 2: Report to the Secretary-General on developments in science and technology and their potential impact on international security and disarmament efforts

As requested by United Nations General Assembly resolution 74/35, the United Nations Secretary-General will report to the 75th session of the General Assembly on current developments in science and technology and their potential impact on international security and disarmament efforts, including on developments related to AI.

- Project Type (Status): Report (Ongoing)
- Project Domain: Peace and security
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://www.un.org/disarmament/topics/scienceandtechnology/

Project 3: The Militarization of Artificial Intelligence

In August 2019, ODA, together with partners from the Stanley Foundation and the Stimson Center, held a closed, informal workshop for a small group of invited States, private sector representatives

and academia, on the peace and security implications of artificial intelligence. A summary of the workshop was published in June 2020.

- Project Type (Status): Meeting and report (Completed)
- Project Domain: Peace and security
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Project Partners: Stanley Center for Peace and Security, Stimson Center (with support from the Government of Switzerland)
- Membership or Secretariat-driven: Membership-driven
- Project Website (links): https://stanleycenter.org/publications/militarization-of-artificial-intelligence/

Project 4: Advocacy on autonomous weapons

The Secretary-General, the High Representative and Under-Secretary-General for Disarmament Affairs and other ODA officials have sought to raise awareness of the possible implications of autonomous weapons and the weaponization of artificial intelligence.

- Project Type (Status): Outreach (ongoing)
- Project Domain: Peace and security
- Related SDGs: SDG 16 Peace, Justice and Strong Institutions
- Membership or Secretariat-driven: Secretariat-driven
- Project Website: https://www.un.org/disarmament/hrstatement/

2. Related Sustainable Development Goals (SDGs)

SDG 16 Peace, Justice and Strong Institutions

3. Relevant links

https://www.unog.ch/80256EE600585943/(httpPages)/8FA3C2562A60FF81C1257CE600393DF6?OpenDocument

https://undocs.org/A/73/177

https://undocs.org/A/74/122

https://www.un.org/disarmament/sg-agenda/

https://s3.amazonaws.com/unoda-web/wp-content/uploads/2019/03/hr-address-high-level-panel-berlin-conference-rethinking-arms-control-15-03-2019-final.pdf

https://s3.amazonaws.com/unoda-web/wp-content/uploads/2019/03/Keynote-speech-by-the-High-Representative-for-Disarmament-Affairs-Ms.-Izumi-Nakamitsu-at-high-level-event-on-frontier-technologies-for-accelerating-Sustainable-Development.pdf

https://s3.amazonaws.com/unoda-web/wp-content/uploads/2019/01/HR-address-IIT-Jan-20194.pdf

https://www.unog.ch/80256EE600585943/(httpPages)/BF18ABFEFE5D344DC1256F3100311CE9?OpenDocument

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UNOV United Nations Office at Vienna

UNODC United Nations Office on Drugs and Crime

United Nations Office at Vienna / United Nations Office on Drugs and Crime

1. Description of Activities on AI

Project 1: Internal Client Management Chatbot

Leveraging AI to deliver useful information to clients on internal services through a chatbot. Chatbot uses scaled questions to deliver information or refer clients to the best internal contact person.

- Project Type (Status): Software product (Ideation)
- Project Domain: Organizational Agility
- AI Approach: Machine Learning
- Datasets: Internally developed Frequently Asked Questions
- Project Partners: OICT
- Membership or Secretariat-driven: Secretariat-driven

Project 2: New Tech Speaker Series

Responding to the Secretary-General's call to all staff to "be humble and continue to learn" related to New Technologies, the UNOV/UNODC Innovation Team together with internal counterparts launched a speaker series focused on promoting awareness of AI (Machine Learning)

- Project Type (Status): Training (Closed)
- Project Domain: Internal Capacity-Development
- Project Partners: Internal counterpart
- Membership or Secretariat-driven: Secretariat-driven

Project 3: Use of real-time information analysis and dark web as related to UNODC areas

Utilizing public and dark web information sources and content analysis through a real-time information tool to analyze emerging trends in UNODC emerging areas to support programme delivery and support to Member States.

- Project Type (Status): Research/Study paper (Data discovery)
- Project Domain: Crime and Security
- AI Approach: Machine Learning
- Datasets: Social media, dark web content
- Project Partners: UN Global Pulse
- Membership or Secretariat-driven: Secretariat-driven

Project 4: Within UNODC mandate areas, how AI can support government as a whole approach in different supply chain contexts

Leveraging new technologies (AI and blockchain) to support governments in improving supply chain efficiency and transparency.

- Project Type (Status): AI/Blockchain (Ideation)
- Project Domain: Crime and Security
- AI Approach: Machine Learning
- Membership or Secretariat-driven: Secretariat-driven

2. Description of Possible Projects on AI

- Use of AI to undertake trend analysis to assess the flow of illicit activities and facilitate programmatic decision-making and enhance technical support.
- Exploration of the use of new technologies to automate processes and increase efficiency, cost effectiveness, and ultimately further augment organization's positive impact.

3. Challenges and Opportunities

- Two main challenges for UNOV/UNODC in terms of activities on artificial intelligence include availability of allocated staff and dedicated financial resources to support and scale initiatives.
- Opportunities: UNOV/UNODC is a global leader in the fight against illicit drugs, organized crime and terrorism and directly assists Member States in these areas.

4. Related Sustainable Development Goals (SDGs)

SDG 16 Peace, Justice and Strong Institutions, SDG 3 Good Health and Well-Being, SDG 5 Gender Equality, SDG 11 Sustainable Cities and Communities

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UNITED NATIONS
Office for Outer Space Affairs

United Nations Office for Outer Space Affairs

1. Description of Activities on AI

Project 1: Monitoring and Achievement of SDG Targets

Space-related services to monitor and achieve SGDs targets. This is part of a broader effort to bring space-related services and products closer to the end-users, including States and United Nations entities, and raise awareness about the opportunities offered by space technologies to meet the global agendas.

- Project Type (Status): Full fledged development (Development)
- Project Domain: Outer Space and SDGs
- AI Approach: Data Analytics
- Datasets: Data from space mission (including Earth Observation Satellites) and data on space-related services for the achievement of the SDGs
- Related SDGs: All SDGs
- Project Partners: Space agencies and the private space sector (to facilitate access to products). European Space Agency (for data exchange). UN-SPIDER.
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.unoosa.org/oosa/en/ourwork/space4sdgs/index.html
- Challenges: Data fragmentation- It is difficult to find relevant data sources due to fragmentation and format (e.g. SDG database is provided in CSV format or RData), while other databases provide an API, while other databases do not provide export functionalities.
- Opportunities: Availability of earth observation data related knowledge and data on space-related services and technologies through UNOOSA
- Contacts: Mr Jorge Del Rio Vera, Scientific Affairs Officer (jorge.delriovera@un.org)

Project 2: Technical session during the World Space Forum: The Benefits of Space for All

Over the past few years powerful new Artificial Intelligence tools have shown promise in the areas of disaster response, informal settlement detection, resilience planning and reducing uncertainty in climate prediction models. Despite the exciting potential, barriers to producing trusted insight are still substantial. This session was a unique opportunity to hear some case studies from AI4EO practitioners, from NVIDIA, Oxford University and Trillium Technologies, who provided an overview of state-of-art and shine a light on what is around the corner.

- Project Type (Status): Report (Closed)
- Project Domain: Outer Space and SDGs
- AI Approach: Machine learning, Analytics

- Datasets: Data from space mission (including Earth Observation Satellites) and data on space-related services
- Related SDGs: SDGs 1, 2, 3, 4, 9, and 17
- Partners: NVIDIA, Oxford University and Trillium Technologies
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.unoosa.org/oosa/en/ourwork/hlf/2019/world-space-forum-2019-presentations.html, Report on the UN/Austria World Space Forum 2019 https://www.unoosa.org/oosa/en/oosadoc/data/documents/2020/aac.105/aac.1051219_0.html
- Challenges: Awareness raising on AI and Earth Observation and the synergies between both. There was strong interest in both sessions, which demonstrated the need of sessions on this topic.
- Contacts: Mr Markus Woltran, Programme Officer (markus.woltran@un.org, +43-1) 26060 5768)

Project 3: Information session to Vienna based entities: Artificial Intelligence for Earth Observation and the SDGs

Session organized by UNOOSA to raise awareness within Vienna-Based Organizations on the use of Artificial intelligence and Earth Observation.

- Project Type (Status): Event (Closed)
- Project Domain: Outer Space and SDGs
- AI Approach: Machine learning, Analytics
- Datasets: Data from space mission (including Earth Observation Satellites) and data on space-related services
- Related SDGs: SDGs 1, 2, 3, 4, 9, and 17
- Project Partners: NVIDIA, Oxford University and Trillium Technologies
- Membership or Secretariat-driven: Secretariat-driven
- Challenges: Awareness raising on AI and Earth Observation and the synergies between both. There was strong interest in both sessions, which demonstrated the need of sessions on this topic.
- Contacts: Mr Markus Woltran, Programme Officer (markus.woltran@un.org, +43- 1) 26060 5768)

Project 4: Brainstorming with UNOV/UNODC in the framework of the innovation group

Discussion on the application of Artificial Intelligence to specific projects in the remit of the innovation group in Vienna.

- Project Type (Status): Other (Closed)
- Project Domain: Drugs and Crime
- AI Approach: Machine learning, Analytics
- Partners: NVIDIA, Oxford University and Trillium Technologies
- Membership or Secretariat-driven: Secretariat-driven
- Challenges: Transparency and Trust were the main points raised as difficulties to provide AI-based services. UNODC relies a lot on human interpretation, and it might be difficult to convince policy-makers to accept analysis made by algorithms. Confidentiality was also an issue, as information cannot be leaked. There are opportunities for AI to guide operators (image analysts), providing them with uncertainty values on the detections highlighted by AI.
- Opportunities:
    - Spatial Hyper-resolution (super-resolution): the use of AI to increase the resolution of images

  - Spectral Hyper-resolution (super-resolution): on the spectral domain, to increase the spectral resolution of images
  - Data fusion with social media
  - Radar colouring: Synthetic Aperture Radar images are black and white but can be coloured by an AI to mimic the appearance of an optical image. This would ease interpretation while providing all weather capability"
- Contacts: Mr Markus Woltran, Programme Officer (markus.woltran@un.org, +43-1) 26060 5768)

Project 5: UN-SPIDER

Creation of step-by-step workflows in GIS software, Python (Jupyter notebooks) and R scripts to download, process and visualize Earth observation data for monitoring and assessing droughts, floods, mudslides, burn severity after forest fires.

- Project Type (Status): Software product/Training (Deployed)
- Project Domain: Disaster management
- AI Approach: Machine learning, Analytics
- Datasets: Sentinels, Aqua/Terra, Landsat
- Related SDGs: SDG 11 and 13
- Partners: UN-SPIDER Regional Support Offices
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): http://un-spider.org/advisory-support/recommended-practices
- Technology: Python, R
- Contacts: Mr Radu Botez, Associate Information and Outreach Officer (radu.botez@un.org, +49 228 815 0677)

Project 6: AI and Climate Action Curriculum

Development of a curriculum module on the utilisation of space-based datasets for the development of AI applications on climate action, targeting girls in developing countries.

- Project Type (Status): curriculum module (Development)
- Project Domain: Outer Space and SDGs
- Related SDGs: SDGs 4, 5, 13, and 17
- Partners: Technovation
- Contacts: Ms Irianna Vlachopoulou, Associate Scientific Affairs Officer (eirini.vlachopoulou@un.org, +43-1_ 26060 5830)

2. Related Sustainable Development Goals (SDGs)

SDG1. No poverty, SDG2. Zero hunger, SDG 3. Good health and well-being, SDG 4. Quality education, SDG 9. Industry, innovation and infrastructure, and SDG 17. Partnership for the goals

3. Relevant links

www.un-spider.org

www.openuniverse.asi.it

www.unoosa.org/oosa/en/oosadoc/data/documents/2016/aac.1052016crp/aac.1052016crp.6_0.html

www.unoosa.org/oosa/oosadoc/data/documents/2018/aac.105/aac.1051175_0.html

Contact information

- Mr Jorge Del Rio Vera, Scientific Affairs Officer, Space Applications Section (Jorge.delriovera@un.org, +43 26 060 4948)
- Mr Ian Freeman, Associate Programme Officer, Office of the Director (ian.freeman@un.org, +43 26 060 8789)

United Nations Research Institute for Social Development

1. Description of Activities on AI

UNRISD has launched a think-piece series on new technology and human rights (More detail here)

Project 1: Think Piece Series

UNRISD has launched a Think Piece Series which invites experts from academia, think tanks and civil society to engage with the topic of linking technology and human rights, and to share their experience at the front lines of policy-driven research and advocacy aimed at leaving no one behind in an increasingly digital, automated world.

This Series aims to provide perspectives on the intersections between new technology and various dimensions of civil and political rights and economic, social and cultural rights, including the right to health, work, social protection, freedom of expression and more. It also presents reflections on how we conceptualize and practice human rights in the face of technology-driven change on a global scale.

The Series was launched to coincide with the 37th Session of the UN Human Rights Council, as part of UNRISD's commitment to promote socially just and sustainable development within and beyond the UN system. It is also part of the UN system's celebration of the 70th anniversary of the Universal Declaration of Human Rights.

- First Edition: From Disruption to Transformation
  - Tech for Transformative Change? Looking beyond Disruption—Kelly Stetter
  - Time for a Fourth Generation of Human Rights?—Changrok Soh, Daniel Connolly and Seunghyun Nam
  - Embracing Human Diversity: Policies and Enabling Factors for Accessible Technologies—Alejandro Moledo
  - Data Frameworks for a Right to Development—Anita Gurumurthy and Nandini Chami
  - Big Data and Monitoring Sustainable Development Goal 3: Not Counting Those Left Behind?—Carmel Williams
  - Accounting for the Most Vulnerable: Ensuring Big Data Works for Sustainable and Inclusive Development—Sabrina Rau and Sheldon Leader
  - How IT Threatens Democracy—Kofi Annan
  - Technology and Freedom of Expression: Opportunities and Threats through the Journalist's Lens—Mariateresa Garrido
  - A Feminist Interrogation of Autonomy on the Internet—Jac sm Kee
- Second Edition: Tools for Transformation

The second edition of this think piece series on new technologies and human rights focuses more on responses and possible solutions to issues sketched out in the first edition. The authors were speakers at our official side event of the 39th session of the United Nations Human Rights Council on new technologies and human rights held in September 2018.

- Profiling and Automated Decision Making: Is Artificial Intelligence Violating Your Right to Privacy?—Tomaso Falchetta
- Legal Literacy: An Essential Complement to Digital and Scientific Literacy—Thérèse Murphy
- Human Rights and New Technologies: Setting the Agenda for Human Rights-Centred Innovation—Molly K. Land

UNRISD held an event on **new technologies and human rights**, co-sponsored by Austria and Denmark, at the 39th session of the UN Human Rights Council. More detail here.

2. Challenges and Opportunities

Great interest in the topic, but difficult to convert into solid funding for holistic and critical research enquiries.

Contact Information

- Mr Paul Ladd, Director (paul.ladd@un.org, + 41 (0)22 917 2949)

1. Description of Activities on AI

Project 1: Strategic Foresight to Applications of Artificial Intelligence to Achieve Water-related Sustainable Development Goals

This report uses strategic foresight to study applications of Artificial Intelligence (AI) to achieve water-related SDGs. The report discusses motivations, applications, and opportunities related to the adoption of AI for sustainable development.

- Project Type (Status): Research Paper (Closed)
- Project Domain: Water/Climate
- AI Approach: Predictive processing- Statistical methods, machine learning, deep learning
- Datasets: Existing research, Global Reservoir and Dam Database
- Related SDGs: SDGs 3, 6, 11, and 15
- Project Partners: McGill University, Hamad Bin Khalifa University, Kobe Institute of Computing, Asian Disaster Preparedness Center, Stockholm Environment Institute, Global Partnership for Sustainable Development Data, National University of Singapore, McMaster University
- Membership or Secretariat-driven: Membership-driven
- Project Website (inks): https://inweh.unu.edu/wp-content/uploads/2020/04/Strategic-Foresight-to-Applications-of-Artificial-Intelligence-to-Achieve-Water-related-Sustainable-Development-Goals.pdf
- Challenges: Lessons learned include: AI models, tools, and technologies need localization before adoption; AI for water-based interventions need support to ensure development outcomes; AI for water-based interventions need flexible policies to adopt new models and frameworks; it is critical to drive AI adoption and create enabling environment through a centralized agency.
- Contacts: Mr Hamid Mehmood (Hamid.Mehmood@unu.edu)

Project 2: AI & Ethics Consortium

NU Institute in Macau is assembling a research team consisting of post-doctoral fellows and senior researchers well-known in the field of AI & ethics, focusing on the Global South. The Institute is setting up a consortium on AI for social inclusion, which aims to bring together experts in higher education institutes from America, Europe, Asia and Africa, international organizations, and other experts in AI policy, governance, design and deployment. It plans to develop capacity-building programmes for policy-makers, other UN entities, and general public, as an integral component of its research design.

- Project Type (Status): Consortium- Research and Convenings (Pending)
- Project Domain: Ethics

- AI approach: Artificial Neural Networks, Statistical methods, Self-organizing map, Machine Learning, Deep learning, Natural language processing, Image recognition
- Datasets: Existing research papers on AI, Foresight analysis
- Related Sustainable Development Goals: Cross-cutting SDGs 8, 10, and 17
- Project Partners: Erasmus University in Rotterdam, UN ESCAP, International Training Center of the ILO, UN System Staff College and the UN Secretariat.
- Membership-driven or Secretariat-driven: Membership-driven
- Project Website (links): https://cs.unu.edu/
- Challenges: The development of AI technologies remains predominantly in the Global North, which risks excluding the voices from the Global South to decide the future pathway of AI. Global participatory AI narrative – that both preserves cultural diversities, while demystify AI – will enable all citizens to participate in the discussion of AI's roles in society. Advice and guidelines on AI must be geared not only towards the Global North but inclusive of the Global South. In Research may explore the issues of AI biases in the globally known recruitment system, and aim to provide not only technical but also social and policy recommendations to Member States.
- Contacts: Mr Jingbo Huang (huang@unu.edu)

Project 3: Code 8.7

There are an estimated 40.3 million people in modern slavery, despite a blanket global ban on such practices. To bring this figure close to zero by 2030 – to meet the UN Sustainable Development Goals Target 8.7 – we would need to reduce the number of people affected by over 10,000 individuals per day. AI and computational science can be an important tool for both preventing and detecting modern slavery, human trafficking, forced labour and child labour. Code 8.7 fosters collaboration between artificial intelligence (AI), computational science and anti-slavery leaders to accelerate progress toward SDG Target 8.7.

- Project Type (Status): Research collaboration and convenings (Full-fledged development)
- Project Domain: Human rights
- AI Approach: Varied and multiple, depending on particular activity and collaborator
- Datasets: Varied, may include: satellite data, financial records, telecom data among others
- Related Sustainable Development Goals: SDGs 5, 8, and 16
- Project Partners: The Alan Turing Institute, the Computing Community Consortium, Tech Against Trafficking, the Rights Lab at the University of Nottingham, the Global Security Initiative at Arizona State University, AnnieCannons and Survivor Alliance.
- Membership-driven or Secretariat-driven: Membership-driven
- Project Website (links): https://delta87.org/code87/
- Challenges: Among the activities within this collaboration are the development of a Code 8.7 Research Roadmap aimed at applying AI to the fight against forced labour, modern slavery, human trafficking and child labour; the identification of a set of research challenges; and the construction of a global anti-slavery observation platform that combines novel, non-traditional data streams to allow AI-based and other related analyses of modern slavery. UNU-CPR is also facilitating the development of an innovation 'sandbox' in the Global South with a leading international data lab and Code 8.7 partners.
- Contacts: Ms Alice Eckstein (eckstein@unu.edu)

2. Description of Possible Projects on AI

In Project II, research may explore the issues of AI biases in the globally known recruitment system, and aim to provide not only technical but also social and policy recommendations to Member States. It also aims to build capacity inside the UN with existing training partners.

In Project III, among the activities within this collaboration are the development of a Research Roadmap aimed at applying AI to the fight against forced labour, modern slavery, human trafficking and child labour; the identification of a set of research challenges; and the construction of a global anti-slavery observation platform that combines novel, non-traditional data streams to allow AI-based and other related analyses of modern slavery. UNU is also facilitating the development of an innovation 'sandbox' in the Global South in collaboration with a leading global data lab and Code 8.7 partners.

3. Challenges and Opportunities

UNU researchers have voiced concerns that the development of AI technologies remains predominantly in the Global North, which risks excluding the voices from the Global South to decide the future pathway of AI. Global participatory AI narrative – that both preserves cultural diversities, while demystify AI – will enable all citizens to participate in the discussion of AI's roles in society. Advice and guidelines on AI must be geared not only towards the Global North but inclusive of the Global South.

UNU research has also identified the ethical challenges associated with AI convergence with other emerging technology. With AI and bio-power convergence, coercive forms of surveillance and use of personal data could open the door to control and manipulation of bio-data with risks to large populations. AI convergence could also create drastic shifts in the future of work, where urbanized populations face new and rapidly changing socio-economic risks.

UNU's 2019 report on The New Geopolitics of Converging Risks: The UN and Prevention in the Era of AI as well as multiple articles on the AI & Global Governance Platform outline principles for responsible deployment of artificial intelligence in the international development setting. At a time of technological rupture, the risks of global insecurity are heightened by trends of isolationism and lack of collective responsibility. To meet these challenges, a common understanding of opportunities and risks across the international community is needed, driven by responsible innovation and incentives for a shared approach to prevention.

The AI & Global Governance platforms reinforces the need to have an open and inclusive discussion about the modalities of global governance in the era of AI and other emerging technologies. A diversity of perspectives is essential to an effective dialogue, not just from those who run leading AI research programs and corporate labs or AI in humanitarian contexts, but also from citizen science and democratized innovation ecosystems.

4. Related Sustainable Development Goals

SDGs 3, 5, 6, 8, 10, 11, 15, 16, and 17

5. Relevant links

https://ourworld.unu.edu/en/artificial-intelligence-and-global-governance

Contact information

- Dr David Passarelli, Executive Director, United Nations University Centre for Policy Research (passarelli@unu.edu)

United Nations Entity for Gender Equality and the Empowerment of Women

United Nations Women

1. Description of Activities on AI

With the rapid digitalization of work, school and social life stimulated by the COVID-19 pandemic, the importance of technology and innovation to achieving gender equality and inclusive development have never been clearer nor more urgent.

From a gender perspective, specific applications of AI and machine learning have shown the greatest risks of bias and misuse, like facial recognition and deep fakes. The AI world today is almost entirely dominated by men and we find societal biases relating to gender roles and identities embedded in social programs and services via automated decision-making. Data modelling such as predictive policing or social intervention increasingly transcends the individual to focus on groups or communities, making women more at risks of being discriminated.

UN Women's role and mandate is to reaffirm the need to focus on diversity and inclusiveness when developing AI technologies. Ensuring that societal values are reflected in algorithms and AI technologies will require no less creativity, hard work and innovation than developing the AI technologies themselves.

In order to drive action and unite efforts from across governments, private sector and civil society, UN Women is convening partners working on gender and technology as part of the Generation Equality Forum. An Action Coalition focusing on innovation and technology will be launched in 2021 to generate innovative ideas for policies and initiatives needed to accelerate progress for more gender-responsive AI.

The Action Coalition will explore how to harness opportunities arising from the use of AI and overcome the challenges associated with algorithms. By breaking down silos and fostering collaboration through this new multi-stakeholder platform, the Coalition aims to inspire public and private partners to make strong and actionable commitments that will advance gender equality and women's rights.

2. Related Sustainable Development Goals (SDGs)

SDG5. Gender Equality, SDG9. Industry, Innovation and Infrastructure, and SDG17.Partnerships to achieve the goal

3. Relevant links

https://forum.generationequality.org/action-coalitions

https://www.unwomen.org/en/get-involved/beijing-plus-25/generation-equality-forum

Contact Information

- Ms Helene Molinier, Senior Manager for the Action Coalition on Innovation and Technology (helene.molinier@unwomen.org, +1 646 781 4467)

United Nations World Tourism Organization

1. Description of Activities on AI

The World Tourism Organization (UNWTO), following its mandate to promote sustainable, accessible and responsible tourism worldwide, foster technology implementation within the sector's value chain and Member States through its UNWTO Tourism Startup Competitions and UNWTO Specific Challenges. Participating entrepreneurs frequently use a combination of technologies including artificial intelligence, virtual and augmented reality, internet of things, big data and blockchain. This integration, commonly led by AI, allow seamless, safe and sustainable manners of travelling.

Project 1: UNWTO Tourism Startup Competitions and Challenges

From 2018 to date, UNWTO has led 6 Startup Competitions. Two of them has addressed sector wide topics to transform the way people travel such as Deep Tech: Location & Geolocation Data, Smart Mobility, Smart Destinations, Disruptive Hospitality, Rural Development and Sustainability. Two has focused on Gastronomy, one in Sports and one in Rural Tourism. Furthermore, it has powered the UNWTO Healing Solutions for Tourism Challenge to address COVID-19 impacts on people, businesses and destinations.

Over 6500 applications from more than 150 countries has been screened to gather 17 winners from which several Artificial Intelligence startups are to be highlighted within the tourism wide value chain. For example, VAT refunds (Refundit), users and brands connections (Klustera), accessibility for people with hearing disabilities (Visualfy), facilitate hospitality operations through chatbot (HiJiffy) or ensure security during the current crisis (See True).

These success cases and their matchmaking with the global tourism innovation and entrepreneurship ecosystem stakeholders demonstrate the power of technology for tourism and sustainability. Project Website (links): https://www.unwto.org/unwto-startup-competition, https://www.unwto.org/unwto-challenges

Project 2: UNWTO SDGs Global Startup Competition

Following the past programmes and in order to provide more solutions for tourism recovery and global sustainability, UNWTO has launched its SDGs Global Startup Competition, a world call to reach the most disruptive startups that directly contribute to accelerate the achievement of sustainable development. This Competition aims to encourage the global innovation and entrepreneurship ecosystem to embrace sustainability and to deliver impact during the United Nations Decade of Action starting this year. Bringing together stakeholders from a variety of sectors across the economy, this initiative sets out to reach a common goal, to set innovation at the forefront of sustainable development in corporations and destinations.

Startups from all walks of life, from all over the world and all economic sectors are invited to participate if meeting the following criteria:

- Be innovative in nature providing value-added solutions
- Be sustainability-driven
- Be scalable: to have potential for international growth and potential to be applied in corporations and destinations (countries, regions)
- Be an Early Stage or Series A startup
- Have a tested pilot and business plan
- Have been accelerated before
- Have a full-time team

All ways of innovation are welcome: new methods, processes, governance models, social impact initiatives, and technologies, including Artificial Intelligence as a lead for disrupting tourism and sustainability.

– Project Type (Status): Event (Recurring event)
– Project Domain: Sustainability, Tourism, Innovation
– AI Approach: Machine Learning and Analytics
– Datasets: Tourist habits / Tourism contribution to sustainability
– Related SDGs: All SDGs
– Project Partners: Wakalua, the tourism innovation hub from Globalia, the Advanced Leadership Foundation, Amadeus, Amazon Web Services Activate, BBVA, ClarkeModet, Far Co, Globant, Google, the Inter-American Development Bank (IDB), IDB Lab, IE University, Impact Hub, Mastercard, Mentor Day, Plug and Play and Telefónica.
– Membership or Secretariat-driven: Membership-driven
– Project Website (Link): https://www.unwto.org/unwto-sustainable-development-goals-global-startup-competition, www.tourismstartup.org

Contact Information

- Ms Natalia Bayona, Senior Expert on Innovation, Digital Transformation and Investments (nbayona@unwto.org)

WFP
wfp.org
World Food Programme

1. Description of Activities on AI

The WFP Innovation Accelerator is currently supporting several projects that use Artificial Intelligence (AI) and Machine Learning (ML) at the core of their product, including:

Project 1: SKAI

A lack of on-the-ground information at the start of a humanitarian crises is a major obstacle to a quick, effective response. SKAI leverages the power of artificial intelligence and remote sensing to assess damage within 24 hours after disasters take place.

- Project Type (Status): Damage assessment demonstrated in a map format (Minimum viable product)
- Project Domain: Emergency Response
- AI approach: A Deep Neural Network compares pre- and post- disaster satellite images of a building and determines whether it is damaged.
- Datasets: Manually compiled damage assessments from past disasters generated by UNOSAT, REACH, DLR, etc.; Satellite imageries purchased from WorldView 2 and 3, Pleiades; Worldpop data on population
- Related SDGs: SDG 2 Zero Hunger and SDG 17 Partnerships for the Goals
- Project Partners: Google
- Project Website (links): https://docs.google.com/presentation/d/1KQJuoBn6UlrI40K9sb-qYwFC4mHD9NI2hUuLQHMOpTA/edit#slide=id.p
- Resources/skill: Machine learning expertise, GIS expertise, Emergency response expertise, UI/UX expertise
- Technology: Deep neural network machine learning model, Google Earth Engine APP
- Challenges: Generalize the model to assess different countries is a challenge; however, we do see promising result by applying semi-supervised methods. Humanitarian sector requests the machine learning model to be developed in an open-source manner; however, the path to open-source intellectual property from our private sector partner side is yet to be laid out.
- Contacts: Mr Kyriacos Koupparis (Kyriacos.Koupparis@wfp.org), Ms Fiona Huang (fiona.huang@wfp.org)

Project 2: Informal Settlement Mapping

COVID-19 is most prevalent in highly-populated urban areas in frontier markets; however, we do not have a high-level understanding of where vulnerable populations are located in urban areas, as WFP usually operates in rural areas.

- Project Type (Status): Informal settlement heat map demonstrated in an interactive map format (Minimum viable product)
- Project Domain: Emergency Response
- AI approach: A random forest machine learning model to identify informal settlements in urban areas on satellite images.
- Datasets: Sentinel-2 satellite imagery, Open Street Map
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Project Partners: Oxford Rhodes AI Lab
- Project Website (links): https://ollielballinger.users.earthengine.app/view/ism
- Resources/skills: Machine learning expertise, Google Earth Engine App expertise, Emergency response expertise, UI/UX expertise
- Technology platform: Random forest machine learning model, Google Earth Engine APP
- Challenges/lessons learned: The sudden surge in demand to conduct informal settlement mapping due to the COVID-19 outbreak leaves us short-staffed in fulfilling these demands.
- Call dial report (CDR) from telecom providers can be crucial in terms of identifying vulnerable populations located in urban areas; however, the process to obtain this data is exceptionally long and complicated.
- Contacts: Mr Kyriacos Koupparis (Kyriacos.Koupparis@wfp.org), Ms Fiona Huang (fiona.huang@wfp.org)

Project 3: Open-sourced Locust Movement Forecasting Tool

Locust outbreak in East Africa has greatly threatened food security. Therefore, information that provides timely locust forecasting as a preparedness measure is needed.

- Project Type (Status): Locust movement production machine learning model shared and developed with open-source programming language, and practices (Concept note)
- Project Domain: Emergency Preparedness
- AI approach: Desert Locust movement prediction and risk mapping is based on field studies that link desert locust ecological conditions and weather conditions that influence their movement, development and reproduction. Combined with crowd-sourced and verified ground information on locust, the prediction has offered regional decision-makers with an early warning information tool that can anticipate high-risk areas and the projected/likely paths on swarm movement.
- Datasets: Weather data are obtained by weather forecasting models run at ICPAC, Vegetation Condition Index
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Project Partners: Oxford Rhodes AI Lab, IGAD
- Resources/skill: Machine learning expertise, GIS expertise, Pest management expertise
- UI/UX expertise
- Challenges/lessons learned: Technology development capacity of humanitarian organizations can be scaled in a cost-efficient way through leveraging engineering communities on a pro-bono basis.

- Contacts: Mr Kyriacos Koupparis (Kyriacos.Koupparis@wfp.org), Ms Fiona Huang (fiona.huang@wfp.org)

Project 4: DEEP (Digital Engine for Emergency Photo-analysis)

When disaster strikes, WFP and its humanitarian partners must respond as quickly and efficiently as possible. A lack of on-the-ground accurate information that can be extracted in a low-resource environment can delay emergency response. The solution, DEEP is an open-source machine learning application that works offline, on commercially available laptops to quickly quantify damage in the area. A fundamental part of DEEP is the capacity-building activity for local populations, to enable them to use the app in an emergency situation.

- Project Type (Status): Damage assessment demonstrated in a map format (Development)
- Project Domain: Emergency Response
- AI approach: A stack of machine learning algorithms that identify damaged buildings in drone imagery. The app is usable offline on a commercially available laptop.
- Datasets: Proprietary drone imageries, OpenAerialMap imageries
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Resources/skill: Machine learning expertise, GIS expertise, Drone expertise
- Challenges/lessons learned:
    - Machine learning applications need to be rooted in emergency response contexts, including challenges related to connectivity and computing power.
    - Complementing drone data gathering with machine learning analysis capacity, like DEEP, is essential to improve the information value chain and decision-making in disaster response
    - Preparedness is key: Without appropriate collaboration with the local government and institutions before an emergency, machine learning is of little concrete value.
    - Building local capacity has enormous value in terms of response speed and information sharing
- Contacts: Mr Marco Codastefano (marco.codastefano@wfp.org), Ms Elizabeth Bourke (elizabeth.bourke@wfp.org)

Project 5: Hunger Map Live

Understanding the food security situation is an intense data analysis exercise with information scattered across different data sources and platforms. HungerMapLIVE brings together streams of publicly-available information on food security, nutrition, conflict, weather and a variety of macro-economic data – including from WFP- all in one place to show a holistic picture of the food security situation. Advanced data visualization tools then convert the resulting analysis of food insecurity at the global, country, and sub-national levels, and display it on an interactive dashboard map.

- Project Type (Status): Food security demonstrated in an interactive map format (Deployed)
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Project Website (links): https://hungermap.wfp.org/
- Contacts: Ms Maria Tavares (maria.tavares@wfp.org)

Project 6: MEZA

Nutrition records for millions of malnourished children lie in remote heatlh clinics around the world. This data is difficult to surface for officers designing nutrition interventions remotely. Getting the data to HQ quickly and cheaply could improve the quality of our interventions. As a solution, WFP developed MEZA- an Optical Character Recognition technology to rapidly collect nutrition and related

health data from remote, low-resource health clinics, enabling WFP and governments to have the information they need to provide high-quality, context-specific, and timely nutrition support.

- Project Type (Status): Nutrition data collection made easy so that decision-makers can act faster, based on the data collected from Health Centers (Deployed)
- Project Domain: Nutrition
- AI approach: An algorithm that converts images of nutritional status of children in health centers into data reports. WFP and other stakeholders need these reports in a timely way, rather than waiting for the delivery of paper sheets to be sent from Health Centers, as is currently done and takes months (e.g. number of stunted children in a given area, etc.)
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Project Partners: Charitable International Analytics, WFP Congo CO, Nutrition BU, The Innovation Accelerator, Congo's Ministry of Health
- Contacts: Mr Nicolas Umuhizi (nicolas.umuhizi@wfp.org)

Project 7: Omdena Challenge

When disasters strike, needs assessments are conducted by humanitarian experts based on the first information collected, their knowledge, and their experience. However, we do not have access to past data that could help build an innovative AI-driven logistic provision model for emergency in cyclones. We have collaborated with Omdena Challenge (crowd-sourced) to bring 40 AI experts and aspiring data scientists from around the world to build the model.

- Project Type (Status): A tool that would help us forecast the needs of cyclone-hit countries (Proof of concept)
- Project Domain: Emergency Response
- AI approach: The team mapped the correlation factors to determine which populations are most in need. As an example, below the income level is correlated with the number of people affected. Taking advantage of past data, the data model predicts affected populations. Once an affected population has been identified, humanitarian actors need to design comprehensive emergency operations, including how much food and what type of food is needed. The project team built a food basket tool, which facilitates calculating the needs of affected populations. The tool also has features to account for factors influencing population needs, such as days to be covered, the number of affected people, pregnancies, children, etc.
- Datasets:
    - IBTrACS: Tropical cyclone data that provides climatological speed and directions of storms (National Oceanic and Atmospheric Administration)
    - EmDAT: Geographical, temporal, human, and economic information on disasters at the country level. (Université Catholique de Louvain)
    - Socio-Economic Factors from World Bank
    - The Gridded Population of the World (GPW) collection: Models the distribution of the human population (counts and densities) on a continuous global raster surface
- Related Sustainable Development Goals: SDG 2 and SDG 17
- Project Partners: Omdena
- Project Website (links): https://omdena.com/blog/ai-disaster/
- Resources/skill: Data Scientists, Data Engineers, Machine learning engineers
- Challenges/lessons learned: Availability of open source data, Dealing with significant outliers
- Contacts: Mr Raghu Nallabotula (raghu.nallabotula@wfp.org)

Project 8: Child Growth Monitor

Timely detection of malnutrition is critical to eliminate preventable child morbidity and mortality. Currently, malnutrition is diagnosed through taking manual measurements of weight, height/length, and mid-upper arm circumference (MUAC). The procedures for taking these anthropometric measurements are complex and require highly trained and skilled personnel as well as expensive equipment. Manual anthropometric measurements are therefore costly and time-consuming. In addition, the accuracy and precision of data are sometimes questionable, due to the limited availability of reliable equipment and human error in measurement taking and recording. At the population level, collection of poor-quality nutrition data during surveys results in inaccurate assessments of national and sub-national nutrition situations. In turn, this leads to unsound decision-making and inappropriate allocation of resources, potentially with devastating implications during emergencies.

- Project Type (Status): Child Growth Monitor is a mobile app-based solution that leverages Artificial Intelligence and Augmented reality to diagnose malnutrition in children (0-5years old) from image data (Deployed)
- Project Domain: Nutrition
- Datasets: Project activities include data collection (manually and with the app) as there are no training datasets currently available. To date, the team has collected 51154 data points, from boys and girls, in collaboration with ACF- Action Against Hunger in India.
- Related Sustainable Development Goals: SDG 2 Zero Hunger (2.2)
- Project Partners: Donors- GSMA / GIZ / UN WFP, Partners-Microsoft US / Tilburg University- Zero Hunger Lab / PHAT Consulting
- Project Website (links): https://childgrowthmonitor.org/, https://www.welthungerhilfe.org/news/latest-articles/2020/early-release-of-child-growth-monitor/
- Resources/skill: Machine Learning & Data analytics, Back-end engineering & Front-end development, 3D & Hardware
- Challenges/lessons learned
    - Hiring senior data analysts / ML engineers at salaries offered within development sector (not competitive compared to private sector)
    - Data collection on hold due to COVID-19 restrictions- all face-to-face data collection activities to be resumed until further notice
    - Securing ethical approval from local/federal governments for data collection
    - Team aiming for measurement accuracy at gold standard levels (90-100%), currently used in manual approach > when accuracy for automated approaches is still yet to be defined

Project 9: OPTIMUS

espite huge efforts of WFP to fight global hunger, there are still millions of poeple going to bed hungry. Through an optimization of the design of food baskets in various WFP Country Offices, there is a potential to serve more people with the same resources and same nutritional value. WFP Supply Chain Planners work intensively with the various experts (across Programme, Nutrition, Procurement, Logistics, Pipeline, etc.) in the CO to map out the operation, and then used Optimus to evaluate alternative implementation plans. By combining our analytics with their field expertise, we were able to identify several improvements to the operation (e.g. implementing a mixed sourcing strategy depending on the province, and replacing the pulses with a more cost-effective alternative, and changing the mix of commodities received through Title II contributions by the USA), adding up to approx. 6M USD (full-cost recovery basis) projected savings for 2020. The necessary decisions were approved by the CD and are in the process of being implemented.

- Project Type (Status): Operational efficiency improved through optimization (Testing)

- Project Domain: Nutrition
- AI approach: Automatically link different datasets and run different scenarios to pick the most optimal choice, in terms of costs and nutritional value contribution.
- Related Sustainable Development Goals: SDG 2
- Project Partners: Tilburg (Netherlands) and Georgia Tech Universities
- Challenges/lessons learned: It is crucial to develop the new tool together with corporate IT team from day 1 to ensure smooth adoption and integration.

Project 10: mVAM Chatbot

In emergency and development contexts, communicating with communities is crucial to ensure that people have access to tailored information, and engage in a dialogue that reinforces their capacity to improve their livelihoods and deal with a crisis. Since 2016, WFP's mVAM has been working to develop and roll out humanitarian chatbots. This technology helps improve communication with populations in hard-to-reach areas by complementing existing communication channels and WFP's food security monitoring systems.

- Project Type (Status): 2-way communication established to collect and share information with a large amount of users simultaneously, at a very low cost (Testing)
- Project Domain: Nutrition/Markets monitoring/Emergency response
- Related Sustainable Development Goals: SDG2 and SDG17
- Project Partners: Encourage standards adoption for internal processes
- Project Website (links): https://agrochatea.minagri.gob.pe/, Nutribot https://speakto.nga.wfp.org/
- Contacts: Ms Francesca Caldari (francesca.caldari@wfp.org)

2. Description of Possible Projects on AI

Project I: Voice to text survey tool

In Ethiopia, thirty-eight percent of children under five years of age are stunted, a form of chronic malnutrition leading to long-term health and cognitive impairment. Nutrition-sensitive social protection programmes of the World Food Programme (WFP) of the United Nations in Ethiopia and the Government of Ethiopia (GoE) have been seriously disrupted as a direct result of the COVID-19 pandemic.

The COVID-19 pandemic demonstrated that WFP and GoE are lacking the capacity to collect critical knowledge about the dietary condition of vulnerable households in rural Ethiopia in order to make programmatic adjustments. This project proposes the development of an innovative Artificial Intelligence phone-based voice-to-text survey tool that will fill WFP and GoE's capacity and knowledge gap and enable them to measure and identify nutrient gaps in the diet diversity of vulnerable households. The project will leverage Ethiopia's high analogue mobile phone adoption and advanced technologies in automated speech recognition (ASR) and machine learning to enable cost-efficient, fast and remote data collection to inform critical decision-making.

3. Related Sustainable Development Goals (SDGs)

SDG2. Zero hunger and SDG17. Partnerships for the goals

4. Relevant links

Innovation Accelerator website

Innovation Accelerator 2019 annual report

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World Health Organization

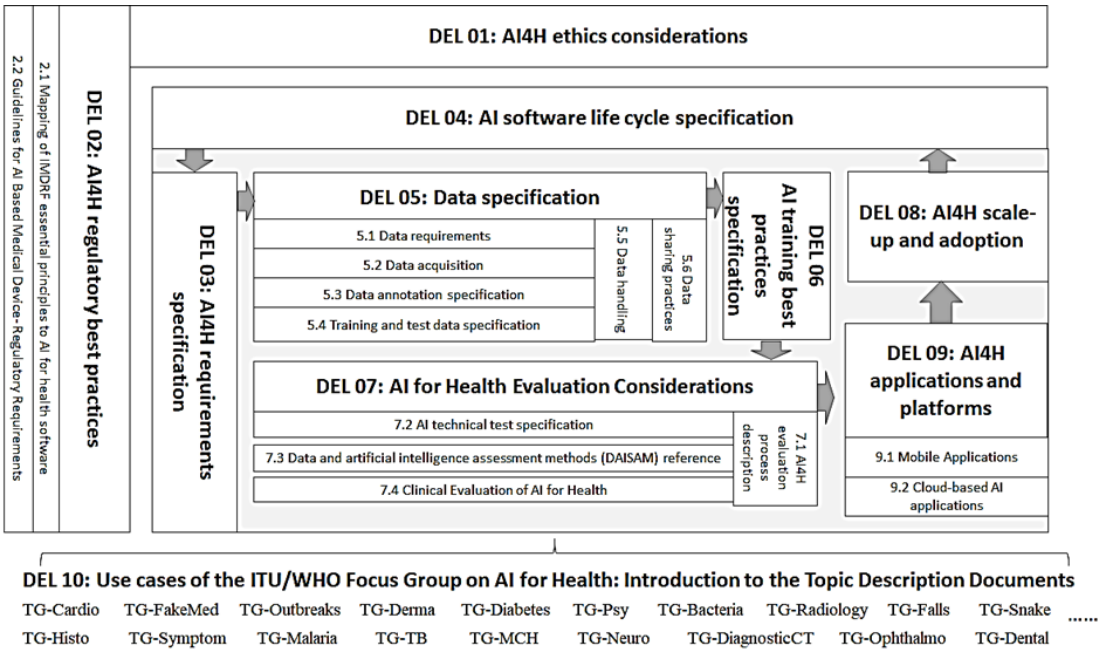
World Health Organization

1. Description of Activities on AI

Following the WHO Resolution WHA 71.1 on Digital Health. WHO has created a new department of Digital health to harness the power and steer digital health and is developing a Global Strategy on Digital Health including the work on progressing the governance , capacity building and collaboration for digital health including AI for health.

In March 2019, WHO and ITU jointly published a brief commentary on the "WHO and ITU establish benchmarking process for artificial intelligence (AI) in health" in the premier medical journal, The Lancet. The commentary provides a description of the ongoing work on the Focus Group on Artificial Intelligence for Health (FG-AI4H) that was established in July 2018.

WHO as part of the management team and technical lead with ITU continues to operationalize the AI for health focus group activities. WHO has been closely coordinating the development of the benchmarking framework on AI for health which will deliver through a set of deliverables.



Under the AI for health workstream, WHO continued its convening power coordinating the Ethics of AI expert group. The group is currently progressing the development of WHO guidance on the ethics and governance of AI in health. Another focus group has also been set up to explore the regulatory implications of AI, an effort aiming for the development of key considerations and a framework to approach the regulations of AI-based health applications.

The increasing use of AI-powered digital solutions brings in added value to the traditional public health interventions and enables WHO to innovate and generate critical knowledge for technology and health community. This work is closely aligned to the draft Global Strategy on Digital health being developed in consultation with WHO Member States.

There are several potential AI for health implementation research and scale projects that WHO is implementing in certain regions and countries. For example, WHO is exploring possibility to establish a framework to optimize local impact of digital learning during public health emergencies. Leveraging machine learning, the organization aims to streamline the transcription and translation process, often human labour intensive, to support the implementation of multilingualism endorsed by United Nations and create positive impact on the health outcome of the vulnerable populations and marginalized communities. WHO is also developing guideline of using AI to detect cervical cancer and documenting 2 projects under implementation on Early detection of breast cancer and AI and Xrays and COVID19.

Moreover, WHO is convening experts and key stakeholders in the digital health ecosystem for an UNESCO conference on AI in later 2020, initiating a global dialogue reflecting different aspects of harness AI during the pandemic. WHO has provided the G20 with progress and guidance on AI for health as part of the G20 2020 digital health agenda. In collaboration with the iDB Digital Health Team, Collaborating Centers and AI experts we are designing a conceptual and operational framework for supporting Member States in the path of adopting AI in Public Health. WHO PAHO has conducting webinars and is creating a network of public health workers with specific interest on AI for Public Health. PAHO have already created an AI4PH knowledge network already established with 1500 people registered.

The main challenge in scaling and benchmarking AI for health solutions is the need for validated unbiased datasets and the regulations to allow for secured dataset to maximise the benefits of AI. These form the base of ethical and regulatory frame of challenges. The other challenge is the need for aligned resource investment to allow for scientific validation of research validation of the application and use of AI in health

WHO through its global strategy and its collaboration with ITU is working on addressing the ethical and regulatory challenges by developing frameworks for Member States and is providing technical support through its HQ Regions and countries. WHO has also widely recognized the value of AI in healthcare and is making efforts provide training to mid-career professionals in expanding their understanding on appropriate ethical and regulated use of AI in healthcare.

The WHO Digital Health and Innovations department is keen to partner with like minded UN agencies and other stakeholders to harness the power and steer digital health to contribute to the attainment of all people to the highest level of health through the GPW13 triple billion goals and SDG3

2. Related Sustainable Development Goals (SDGs)

SDG3. Good health and well-being

Contact information

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WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

World Intellectual Property Organization

1. Description of Activities on AI

WIPO has developed several AI tools. These include a machine translation tool (WIPO Translate), a trademark image similarity search tool in the Global Brand Database, an automatic patent classification tool (IPCCAT) and a speech-to-text tool for conferences. These are available for use on the WIPO web site and shared with national patent offices. WIPO Translate has been provided to several UN organizations and a few other intergovernmental organizations with customization based on domain information. WIPO continues to investigate the development of new AI tools. Information on tools is available at https://www.wipo.int/about-ip/en/artificial_intelligence/ip_administration.html..

In view of the dynamically changing and complex nature of AI technologies, WIPO published the *WIPO Technology Trends* (WITT) report on AI in January 2019. The WITT showed that there is a large demand for intellectual property (IP) rights in AI technologies. It presents the analysis of more than 340,000 AI-related patent applications and 1.6 million scientific papers published since the 1950s. The WITT also contains comments and suggestions made by 27 world leaders in the field. The publication and more information are available at www.wipo.int/tech_trends/en/artificial_intelligence/.

The growth of AI across a range of technical fields raises a number of policy questions with respect to IP. The main focus of those questions is whether the existing IP system needs to be modified to provide balanced protection for machine created works and inventions, AI itself and the data AI relies on to operate. WIPO started an open process to lead the conversation regarding IP policy implications, with the objective to provide Member States with an opportunity to exchange views on various topics regarding AI and to formulate questions with respect to the possible impact of AI on the IP system (https://www.wipo.int/about-ip/en/artificial_intelligence/policy.html).).

WIPO held a First Session of the Conversation on AI and IP in September 2019. On December 13, 2019 WIPO published a draft issues paper to provide the basis for a shared understanding of the main questions that need to be discussed or addressed in relation to IP policy and AI. A second session of the WIPO Conversation on IP and AI took place by way of a virtual meeting on July 7-9, 2020. Over 2,000 people from 130 countries, including representatives of member states, academic, scientific and private organizations joined the meeting to discuss a number of the issues raised in the Revised Issues Paper (https://www.wipo.int/meetings/en/details.jsp?meeting_id=55309).).

In June 2020, WIPO published the AI and IP Strategy Clearing House, which is a new facility in the field of AI, IP and data published on the WIPO webpage. The facility currently contains information from 43 Member States. The Clearing House summarizes information regarding country and regional strategies, frameworks and legislation of relevance to AI, IP and data and is intended to facilitate information sharing (https://www.wipo.int/about-ip/en/artificial_intelligence/policy.html#clearing_house).).

2. Related Sustainable Development Goals (SDGs)

SDG9. Industry, innovation and infrastructure and SDG17. Partnerships for the goals

3. Relevant links

www.wipo.int/ai

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World Meteorological Organization

1. Description of Activities on AI

Project 1: Concept for Exascale Computing, Data handling and AI for Earth System

AI and Exascale Computing offer great potential for improving our predictive skills in weather, climate and environment and the delivery of the information to society. WMO Research Board identified AI and Exascale Computing as highly relevant topics to weather, climate, water and environment. In this context, the Research Board organized initial inputs from its key stakeholders to develop a concept on Exascale and AI. At its meeting in April 2020, the Research Board reviewed the initial concept and decided to establish the Task Team on Exascale Computing, Data handling and AI to support in finalizing the concept and to coordinate and facilitate the activities in these topics.

Building on the concept initiated by the Research Board, the Task Team works closely with its stakeholders and partners on reviewing the existing efforts on Exascale and AI research within and outside WMO and identifying priority activities for international coordination that can contribute to accelerating efforts in the areas of weather, climate and environment and ensure the information and knowledge generated can be shared broadly. The team is advancing towards making proposals to the Research Board for specific activities including mechanisms for coordinating with WMO research programmes and two technical commissions.

In addition to the above activities of the Task Team, various activities on AI and Exascale are ongoing in WMO. The WMO Working Group on Numerical Experimentation has been working on Exascale and AI from model development perspective. It is planning its efforts in sharing approaches and findings. WMO World Climate Research Programme (WCRP) is pursuing Digital Earths activities towards the co-development of high-resolution Earth system modeling and exploitation of billions of observations with high-performance computing, big data and AI methodologies. WMO World Weather Research Programme (WWRP) has identified emerging technologies as one of the societal challenges to address. WMO Global Atmosphere Watch (GAW) is working on data fusion methods to be applied to related air-quality data.

- Project Type (Status): Concept note (Research/Study paper)
- Project Domain: Weather, Climate, Water and Environment
- AI approach: AI, Exascale Computing and Data handling
- Datasets: Weather, climate, water and environment data
- Related Sustainable Development Goals: SDGs 9, 11, 13 and 17
- Project Partners: WMO Members and Partners
- Project Website (links): https://public.wmo.int/en/governance-reform/research-board

2. Description of Possible Projects on AI

- Based on the Concept on Exascale and AI, the Task Team on Exascale Computing, Data handling and AI will be developing research projects that coordinate international efforts to foster research on Exascale and AI for Earth System.
- WMO WWRP and WCRP are exploring an activity that is to explore new services based on AI methods and applied to the WWRP/WCRP Subseasonal to Seasonal Project database.

3. Challenges and Opportunities

- **Challenges:** To ensure all the Members especially developing countries have access to high quality forecast products and information, To help fill the capacity gap between more and less developed countries with international coordination
- **Opportunities:** To coordinate and facilitate international efforts in accelerating the areas of weather, climate, water **and** environment, To enhance collaboration between meteorology and computational science to co-design the system and applications

4. Related Sustainable Development Goals (SDGs)

SDG9. Industry, Innovation and Infrastructure, SDG11. Sustainable Cities and Communities, SDG13. Climate Action, SDG17. Partnership for the Goals

5. Relevant links

https://public.wmo.int/en/governance-reform/research-board

https://public.wmo.int/en/programmes/world-weather-research-programme

https://public.wmo.int/en/programmes/global-atmosphere-watch-programme

https://public.wmo.int/en/programmes/world-climate-research-programme

http://wgne.meteoinfo.ru/

Contact information

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- Mr Wenchao Cao (wcao@wmo.int)

World Bank Group

1. Description of Activities on AI

Project 1: Creating Global Public Goods – Famine Action Mechanism (FAM)

Continue leveraging the Famine Early Action Mechanism (FAM), a joint WBG-UN initiative, engaged in partnerships with global technology firms such as Amazon, Google, and Microsoft, as well as such data providers and technology experts to, support the development of AI/Machine Learning driven models predicting probabilities of food crisis. FAM illustrates the World Bank's efforts to promote a preventative and preparedness approach to crises and is a concrete application of the Global Crisis Risk Platform (GCRP). The FAM also represents the deepening of partnerships across the humanitarian and development communities to address the most complex, multi-dimensional challenges of extreme poverty.

Work with the UN family to operationalize the Principles of Trustworthy AI by re-imagining the Health sector (ITU), focusing on AI Ethics and Humanity (UNESCO), and leveraging data and AI for insights on effective COVID-19 response (UN Global Pulse and WHO).

Participate actively in the Experts Group of the OECD AI Policy Observatory that aims to help countries enable, nurture and monitor the responsible development of trustworthy AI.

- Project Type (Status): Software product (Deployed)
- Project Domain: Famine
- AI approach: Machine Learning
- Project Partners: UNs, Amazon, Google, and Microsoft (data providers and technology experts)
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://dppa.un.org/en/innovation
- Opportunities: Technology know-how of private sector partners

Project 2: Developing Knowledge and Policies

This year, the World Bank teams have actively looked at operationalizing the principles for trustworthy AI adoption and use by:

- Developing a **policy-making guide** for developing countries by examining new policy and regulatory pathways for harnessing AI to meet human and economic development objectives in developing countries and emerging economies by (1) analyzing emerging practices in the AI policymaking landscape globally, including developing countries, (2) identifying upsides and opportunities for development as well as downside risks such as inequality, threats to employment, privacy, security, and inclusion and human dignity), and (3) synthesizing these inputs into an actionable enabling policy making framework.

- Focusing on **AI use in specific development sectors** such as the preparation of a new GovTech report on 'AI in Public Sector: Maximizing Opportunities, Minimizing Risks'. This report covers the ethical principles, opportunities and use cases of AI in the public sector. Also, there is an on-going work on Inclusive and Open AI for Human Capital that looks at AI use in education, health and social protection, to accelerate development and adoption and minimize risks.
- The International Finance Cooperation (IFC) has also prepared a **series of analytical briefings** to guide investments in emerging markets. The emphasis is on fostering innovations as well as eliminating obstacles to using and to the adoption of promising new technologies, i.e., AI. This series includes a focus on AI use in selected industries such as Agribusiness, Financial Services, Power sector, as well as safer, cleaner and more reliable Transport.
  - Project Type (Status): Software product (Proof of concept)
  - Project Domain: Governance/Poverty
  - AI approach: Machine learning/Data Science
  - Datasets: Synthetic anonymized training data
  - Project Partners: UNs, Amazon, Google, and Microsoft (data providers and technology experts)
  - Membership or Secretariat-driven: Secretariat-driven
  - Project Website (links): https://dppa.un.org/en/innovation
  - Opportunities: Technology know-how of private sector partners

Project 3: Piloting AI in World Bank operations

The World Bank Group's **Technology & Innovation Lab** serves as a knowledge and advisory hub around emerging technologies. The Lab explores and provides technology advice on emerging technologies' potential for innovative problem-solving, and operationalization approaches in both WBG internal and external operations. The Lab has partnered with WBG teams across various sectors to solve development challenges by applying user-centric design and technology foresight, and through prototyping and exploration with AI capabilities [e.g., machine learning (ML), neural networks, natural language processing (NLP), assistive technologies (chatbots), etc.]. This year, the Lab team helps in piloting AI in the following areas:

- **Social Protection**- Improving Poverty Identification for Social Protection in Tunisia.
- **Climate investments**- Leveraging AI and Geospatial technologies to enable better decisions on climate smart investments in Philippine.
- **Procurement**- Augmenting Romania Public Procurement Agency's Legislative and Regulatory functions by leveraging AI capabilities.
- **Jobs** - Increased Job Opportunities for Youth in South-Africa by leveraging AI models to enhance Job Matching and Retention.
- **Green Bonds**- Intelligent Reporting for Green Bonds Investment.
- **Women Inclusion**- Improve access to Finance for Women SMEs by leveraging ML for business productivity and credit worthiness in Ethiopia.
- **Financial Services**- Leveraging AI Cognitive Service for Identity Management and KYC (Know-Your-Customer) for Kenya Micro pension System.

The COVID-19 Pandemic has also intensified institutional demand from the World Bank Group's **Analytics and Tools Team (DECAT)** to applying AI capabilities for better development insights and operations. The DECAT team has contributed to several joint initiatives (i.e., 19 major analytical products and 21 joint activities) to support the WBG's COVID response such as the following two examples:

a) **COVID Mobility Patterns** - Location analysis to understand how social distancing policies are working in Indonesia and several other countries. The team used *Cuebiq* data to analyze privacy-

protected GPS location data from over 80 mobile apps and more than 275,000 app users who consented to sharing their location. This blog post summarizes results.

b) **Quantifying Risks in Food Security**- Using deep learning and natural language processing to extract famine-relevant information from the news media, offering the possibility to generate news-based forecasts at high frequency to identify news mentions of phenomena that are predictive of future episodes of food insecurity.

2. Examples of on-going Projects using AI

- **Air Quality** – Analyzing streams of vehicles on streets, e.g., in Cairo, Egypt, using high-resolution satellite imagery to estimate air pollution and explore management scenarios.
- **Resilient Housing**- Predicting housing characteristics (size, material, quality, construction type, vintage etc.) using street view and drone imagery, and processing through ML.
- **Livestock Tracking** - Tracking livestock through a network of sensors (IOT) and analyzing their activity patterns by using responsibly ML.
- **Tourism Recovery in post COVID-19**- Inform the support needed at "destination management organizations" for tourism sector.
- **Chatbot for Smart Trade Platform**- Help users search trade data and perform knowledge search to get details on definitions and methodology (https://wits.worldbank.org))
- **Operations and Due Diligence** - Predicting accounting Red-Flags from external financial reports.
- **Solar Energy** - Use of AI to gather data from IoT devices from solar grids to predict and lower the cost per kWh.
- **Modern Smart Grids** - Assessment of AI practices and solutions applied to tackle the cost and control of modern smart grids.
- **Solid Waste Management** - Detection and classification of plastics on beaches, rivers, and waterways to identify the most abundant through ML and geospatial data to establish the basis for developing plastic policies and reduce plastics pollution.

3. Challenges and Opportunities

Challenges:

- Data Privacy & Security: The reliance on data prompts the WBG to engage externally and obliges internally strict guidelines on data privacy, in addition to adhering to global standards of data privacy such as EU's GDPR
- Data Scarcity: Lack of standardized datasets and thus volume requires data scientist to use new methodologies to attain enough data, these include: Supervised learning, Active Learning, and Transfer Learning methodologies
- Algorithm Bias: Biased datasets generate biased outputs. Human interaction to minimize outliers in datasets can minimize their influence, however, can be time consuming.

Opportunities:

- Increased Demand: The COVID crisis has propelled digital transformation and create an increased demand from WBG client countries to gain a better understanding of key policy elements to enable AI adoption and expand AI-enhanced development opportunities.

- Internal Capabilities: WBG teams are steadfast to test theories, experiment usages and build evidence on harnessing AI for development.
- Trustworthy AI: The WBG teams are promoting the experimentation and implementation of responsible AI use. WBG will engage with policy makers around the world to build evidence towards a future with AI at the forefront of achieving SDGs.

4. Related Sustainable Development Goals (SDGs)

SDGs 1, 2, 3, 7, 9, 10, 11, 13, 16 and 17

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UNITED NATIONS HUMAN RIGHTS OFFICE OF THE HIGH COMMISSIONER

Office of the United Nations High Commissioner for Human Rights

1. Description of Activities on AI

Project 1: Expert seminar on artificial intelligence and the right to privacy

Human Rights Council resolution 42/15 requested UN Human Rights to organize a one-day expert seminar to discuss how artificial intelligence, including profiling, automated decision-making and machine-learning technologies may, without proper safeguards, affect the enjoyment of the right to privacy. The seminar took place as a public online event over two half-days on 27/28 May 2020. One important area of discussion were the specific challenges for the right to privacy that the rapidly increasing use of AI brings about. The seminar also highlighted the key role that privacy plays in safeguarding other human rights affected by AI. It also articulated safeguards and processes that States, businesses and international organisations are required to put in place to promote and protect the right to privacy in the digital age.

- Project Type (Status): Full fledged development (Framework/Strategy/Policy)
- Project Domain: Right to privacy
- AI Approach: Events
- Project Website (links): https://www.ohchr.org/EN/Issues/DigitalAge/Pages/SeminarArtificialIntelligence.aspx
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 2: Report on peaceful protests and new technologies

In its resolution 38/11, the Human Rights Council requested the United Nations High Commissioner for Human Rights to prepare a thematic report on new technologies, including information and communications technology (ICT), and their impact on the promotion and protection of human rights in the context of assemblies, including peaceful protests. The report, presented at the 44th session of the Human Rights Council highlights not only the character of new digital technologies as enablers of the enjoyment of human rights but also delves into issues linked to various surveillance technologies, including AI-based surveillance (such as facial recognition) of organizers of and participants in peaceful assemblies. Among other recommendations, it calls for a moratorium on the use of facial recognition in the context of peaceful assemblies.

- Project Type (Status): Report (Report)
- Project Domain: Freedom of peaceful assembly, freedom of expression, right to privacy
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 3: B-Tech Project

UN Human Rights has launched the B-Tech Project which develops authoritative guidance and resources to enhance the quality of implementation of the United National Guiding Principles on

Business and Human rights with respect to a selected number of strategic focus areas in the technology space. It focuses on the following thematic areas, all of which touch upon important aspects of the development, deployment and use of AI: (1) Addressing Human Rights Risks in Business Models; (2) Human Rights Due Diligence and End-Use; (3) Accountability and Remedy; and (4) A Smart Mix of Measures: Exploring regulatory and policy responses to human rights challenges linked to digital technologies.

- Project Type (Status): Full fledged development (Framework/Strategy/Policy)
- Project Domain: Human rights
- Project Website (links): https://www.ohchr.org/EN/Issues/Business/Pages/B-TechProject.aspx
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 4: Development of UN system-wide guidance on human rights diligence in the context of developing, deploying and using new technologies

In his Roadmap for Digital Cooperation, the Secretary-General asked UN Human Rights to develop UN system-wide guidance on human rights diligence in the context of developing, deploying and using new technologies (A/74/821).

- Project Type (Status): Full fledged development (Framework/Strategy/Policy)
- Project Domain: Human rights
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 5: Co-lead of implementation of the data protection pillar of the UN Data Strategy

In June 2016, the Secretary-General presented the UN Data Strategy for Action by Everyone, Everywhere. Data Protection and Privacy is one of the priority areas in the strategy. OLA, EOSG and UN Human Rights are the co-leads of the implementation of this priority area).

- Project Type (Status): Full fledged development (Framework/Strategy/Policy)
- Project Domain: Human rights, Data protection
- Project Website (links): https://www.un.org/en/content/datastrategy/
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 6: Universal Human Rights Index

The Universal Human Rights Index (UHRI) is designed to facilitate access to human rights recommendations issued by three key pillars of the United Nations human rights protection system: the Treaty Bodies established under the international human rights treaties as well as the Special Procedures and the Universal Periodic Review (UPR) of the Human Rights Council. Many of these outputs have been manually tagged for eight years. We have used this training dataset to build a natural language classifier, using a neural network, to create recommendations for how outputs should be classified.

- Project Type (Status): Proof of concept (Software product)
- Project Domain: Human rights
- AI Approach: Software application
- Datasets: Universal Human Rights Index
- Related Sustainable Development Goals: All SDGs
- Project Partners: HuriDocs, Danish Institute for Human Rights
- Membership or Secretariat-driven: Secretariat-driven

- Project Website (links): https://uhri.ohchr.org/en
- Resources/Skills: Natural language processing, software development
- Technology: PyTorch
- Challenges: Data quality and consistency in the tagging of training data is key. We are redeveloping the model on the basis of improved training data, with more consistent tagging.
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Project 7: Digital Image Verification and Classification Project

In the past, human rights investigations faced challenges in gathering sufficient data, but with the advent of portable consumer technologies the challenge has evolved. The amount of data is not such a pressing issue, but filtering information to create useful evidence is a challenge. The recent experience of the Commission of Enquiry on the protests in Gaza or the current experience of the Commission of Enquiry on the Syrian Arab Republic are instructive. Both initiatives have received huge quantities of video and image data from networks of informants, a big challenge to authenticate, classify and analyse into useful evidence. This project works to address this need by further developing existing open source tools, available to the human rights ecosystem, and creating an internal instance for conducting the same analysis on confidential information.

- Project Type (Status): Full fledged development (Software product)
- Project Domain: Human rights
- AI Approach: Further development of an existing software application
- Datasets: DEFACTO: Image and Face Manipulation Dataset
- Related Sustainable Development Goals: All SDGs, especially SDG 16
- Project Partners: Information Technologies Institute of the Centre for Research and Technology Hellas (ITI-CERTH)
- Membership or Secretariat-driven: Secretariat-driven
- Project Website (links): https://www.invid-project.eu/
- Resources/Skills: Forensic image analysis and classification. Software development
- Technology: PyTorch
- Challenges: Video tampering detection is computationally expensive, and we are looking for more efficient ways to perform this task.
- Contacts: Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Human Rights Council, Advisory Committee

Project: Report of the Advisory Committee of the Human Rights Council on New and Emerging Digital Technologies and Human Rights

Pursuant to the adoption by the Human Rights Council resolution "New and emerging digital technologies and human rights" (A/HRC/RES/41/11) at the forty-first session, the Advisory Committee is mandated to prepare a report on the impacts, opportunities, and challenges of new technologies with regard to the promotion and protection of human rights, including mapping of relevant existing initiatives by the United Nations (UN) and recommendations on how human rights opportunities, challenges, and gaps arising from new technologies could be addressed by the Human Rights Council and its special procedures and subsidiary bodies in a holistic, balanced, and pragmatic manner and to present the report to the Council at its forty-seventh session (June 2021). The report will address a range of issues linked to the use of AI.

- Project Type (Status): Full fledged development (Report)

- Project Domain: Human rights
- Contacts: Mr Eric Tistounet, Chief, Human Rights Council Branch (etistounet@ohchr.org), Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Special Procedures of the Human Rights Council

Project: Human Rights Council report of the Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance on Racial discrimination and emerging digital technologies: a human rights analysis (A/HRC/44/57)

The Special Rapporteur analyses different forms of racial discrimination in the design and use of emerging digital technologies, such as AI, and focuses in particular on the structural and institutional dimensions of this discrimination. She also outlines the human rights obligations of States and the responsibility of corporations to combat this discrimination.

- Project Type (Status): Full fledged development (Report)
- Project Domain: Human rights
- Project Website (links): https://www.undocs.org/A/HRC/44/57
- Contacts: Mr Beatriz Balbin Chamorro, Chief, Special Procedures Branch (bbalbin@ohchr.org), Mr Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Human Rights Committee

Project: General comment No. 37, Article 21: Right of peaceful assembly

The General Comment No. 37 on the right of peaceful assembly was adopted on 23 July 2020 during the 129th online session of the Human Rights Committee. The General Comment addresses extensively question linked to the use of digital technologies, including AI-based tools, both by organizers of and participants in assemblies and state authorities.

- Project Type (Status): Full fledged development (Other)
- Project Domain: Human rights
- Project Website (links): https://www.ohchr.org/EN/HRBodies/CCPR/Pages/GCArticle21.aspx
- Contacts: Ibrahim Salama, Chief, Human Rights Treaties Branch (isalama@ohchr.org); Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Committee on the Rights of the Child

Project: Committee on the Rights of the Child - Drafting of a General Comment on children's rights in relation to the digital environment

The Committee on the Rights of the Child is currently drafting a general comment on children's rights in relation to the digital environment. This comment also touches upon issues relating to AI.

- Project Type (Status): Full fledged development (Other)
- Project Domain: Human rights
- Project Website (links): https://www.ohchr.org/EN/HRBodies/CRC/Pages/GCChildrensRightsRelationDigitalEnvironment.aspx
- Contacts: Ibrahim Salama, Chief, Human Rights Treaties Branch (isalama@ohchr.org); Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

Committee on the Elimination of Racial Discrimination

Project: CERD - drafting of a General recommendation No. 36 on Preventing and Combating Racial Profiling

During its 98th session, from 23 April to 10 May 2019, the Committee on the Elimination of Racial Discrimination initiated the drafting process of general recommendation n° 36 on preventing and combatting racial profiling. Algorithmic profiling is one of the topics that are being considered by the Committee.

- Project Type (Status): Full fledged development (Other)
- Project Domain: Human rights
- Project Website (links): https://www.ohchr.org/EN/HRBodies/CERD/Pages/GC36.aspx
- Contacts: Ibrahim Salama, Chief, Human Rights Treaties Branch (isalama@ohchr.org); Scott Campbell, Senior Human Rights Officer (scampbell@ohchr.org)

2. Related Sustainable Development Goals (SDGs)

SDGs 1, 2, 3, 7, 9, 10, 11, 13, 16 and 17

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Office of Special Adviser to the Secretary-General

1. Description of Activities on AI

Project 1: Expert seminar on artificial intelligence and the right to privacy

As part of the follow-up to the Secretary General's Roadmap for Digital Cooperation, the Office of the Special Adviser to the Secretary General is coordinating the implementation of the Secretary-General's proposal to establish a multi-stakeholder advisory body on global artificial intelligence cooperation. The body will provide guidance on artificial intelligence that is trustworthy, human-rights based, safe and sustainable, and promotes peace. The advisory body will bring a diverse group of relevant entities in the AI landscape to address issues around inclusion, coordination, and capacity-building by sharing and promoting best practices, as well as exchanging views on artificial intelligence standardization and compliance efforts.

- Project Type (Status): Multi-stakeholder Advisory Body (In establishment)
- Project Domain: Artificial Intelligence
- AI approach: Global Digital Cooperation and Coordination
- Datasets: Global AI Initiative Mapping and a living-knowledge repository of research relevant to the operations of the advisory body
- Project Partners: External, including member states, companies, universities and think tanks, civil society organizations, and UN agencies.
- Membership or Secretariat-driven: Membership-driven

2. Related Sustainable Development Goals

SDGs 4-5, 9-10, 12-13, and 16-17

3. Relevant links

- Secretary-General's Roadmap for Digital Cooperation: https://www.un.org/en/content/digital-cooperation-roadmap/

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