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| **Abstract:** | This document contains the draft report of the second meeting of ITU-T Focus Group on Artificial Intelligence for Health (FG-AI4H). Revision 1 corrects registration mistakes by the secretariat. |

Executive Summary

The second meeting of the FG‑AI4H was held in New York City at Columbia University venues, 15-16 November 2018, preceded on 14 November 2018 by the second ITU/WHO Workshop on Artificial Intelligence for Health. About 100 participants attended the workshop and meeting.

The following were the main results from the second meeting.

The FG‑AI4H added Ms Naomi Lee (The Lancet Journal) as a vice‑chairman.

FG‑AI4H established initially three Ad-Hoc Groups (AHGs):

* Data handling and data acceptance
* Test data set assessment
* Thematic classification scheme

The FG reviewed 28 input documents (21 proposals) and issued the following output documents:

* B-102: Call for Proposals: use cases, benchmarking, and data (version 2)
* B-103: Updated draft criteria for data to be accepted by the FG-AI4H
* B-104: Draft thematic classification scheme
* B-105: Draft FG-AI4H data handling policy.

The updated “Call for Proposals: use cases, benchmarking, and data,” will be issued after clean up as B-102 two weeks after the end of the FG meeting.

The next meeting of FG‑AI4H will take place in Lausanne, Switzerland, 22-25 January 2019. Updated information will be made available on the FG webpage, <https://itu.int/go/fgai4h>.

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# Opening

The 2nd meeting of the Focus Group on Artificial Intelligence for Health (FG-AI4H) was held in New York City, USA, on 15 and 16 November 2018 hosted by Columbia University School of Nursing & Center for Evidence-based Practice and Department of Biomedical Informatics, respectively. The FG-AI4H meeting was preceded by the 2nd ITU/WHO workshop on “Artificial Intelligence for Health” on 14 November 2018, hosted by Columbia University's Department of Computer Science. About a hundred participants attended the workshop and meeting.

The meeting was opened by the chairman on 15 November 0940 hours EST at the School of Nursing.

# Approval of agenda

The agenda in [B-001-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-001.docx) was presented and adopted.

# IPR

The group was made aware of the IPR patent policy to be followed by the FG.

Lausanne University Hospital (CHUV) informed the meeting that its proposal in B-016 contained EPFL-patented technology.

# Allocation of contributions

[B-001-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-001.docx) ("Agenda"; Chair) was presented to the group and adopted without changes.

# Communications from the FG Chairs

There were no communications from the FG Chairmen presented.

# Report on Meeting A; other updates

The report of the 1st FG-AI4H meeting in [A-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-101.docx?d=wf941d64c0dee47f4ad9ccfd19d946613) was reviewed and approved without comments.

# Second ITU-WHO workshop on "Artificial Intelligence for Health"

The second ITU/WHO workshop on "Artificial Intelligence for Health" was held on 14 November 2018, hosted at Columbia University's Faculty House. All the details are found at [https://itu.int/en/‌ITU-T/Workshops-and-Seminars/20181114](https://itu.int/en/ITU-T/Workshops-and-Seminars/20181114). A summary of outcomes was presented by to the FG-AI4H as found in [B-002](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-002.docx) and noted.

# Contributions

[B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx): Proposal submission questionnaire (FG-AI4H)

B-006 was introduced with basic questions that should be answered by each of the proposals received at this meeting. The chairman asked all proponents to include in a revised version of their documents the answer in writing to the ten questions and submit it to the secretariat and noted that the group would use the answers to assess the various submissions.

After some presentations, it was felt that the questionnaire could be improved. After some attempts to edit the document, it was agreed to create a breakout group chaired by Mr Daidi Zhong, which met during lunch break of day 2. The group felt that more time was needed, also that the questionnaire should be embedded in the call for proposals document (§‎9.3).

## Diagnostic imagery

[B-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-012.docx): Proposal: First medical decision‐support tool for snake identification based on artificial intelligence and remote collaborative expertise (Institute of Global Health, Faculty of Medicine, University of Geneva)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document contains a use-case proposal for a first medical decision‐support tool for snake identification based on artificial intelligence and remote collaborative expertise.

After presentation, the authors provided the answers to the questionnaire in B-006, as found in [B‑012‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-012-R1.docx).

[B-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-013.docx): Proposal: Using machine learning and AI for validation of Alzheimer's disease biomarkers for use in the clinical practice (Laboratory for Research in Neuroimaging, Department of Clinical Neurosciences, Faculty of Biology and Medicine, UNIL Centre Hospitalier Universitaire Vaudois (CHUV).

This document contains a use-case proposal for using machine learning and AI for validation of Alzheimer's disease biomarkers for use in the clinical practice.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑013‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-013-R1.docx).

[B-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-014.docx): Proposal: Machine learning-based profiling of tumor-infiltrating lymphocytes in breast cancer (Institute of Pathology, Charité Universitätsmedizin Berlin & Berlin Institute of Health & Berlin Big Data Center & Berlin Center for Machine Learning)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). A use case for the benchmarking of artificial intelligence methods in histopathological images with a focus on the identification of tumour cells and scoring of tumour-infiltrating lymphocytes in breast cancer is proposed.

It was noted that submitters should be aware that lack of publicly available data will prevent a solution being identified / developed.

It was also noted that it is desirable to pool sub-sets of data from different organizations.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑014‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-014-R1.docx).

[B-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-017.docx): Proposal: A mobile AI approach to biometric identity (Element Inc.)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was noted as the author was not available to present the document.

After review,the authors are a submission at the next meeting with attendance of the authors, in response to the updated Call for Proposals in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx)

[B-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-018.docx): Classification of autism spectrum disorder based on brain image using convolutional neural networks (Columbia University)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). Autism Spectrum Disorder (ASD) is a developmental disorder that affects social skills and behaviours. In neuroimaging studies, machine learning or deep learning methods are applied to diagnosis of ASD which may assist physicians or psychiatrists. In this proposal, the classification of the brain images for ASD using Convolutional neural networks (CNN) is explored, which is based on resting-state functional MRI (rs-fMRI) and structural MRI data. The CNN model was tested on ASD brain imaging data from Paris-Saclay Center for Data Science. Results of classification accuracy is reported to be around 65% using three hidden layers and multiple nodes of CNN. The limitation of this study is that the correlation map obtained from the rs-fMRI data is not a real image, so it was noted that CNN would not perform well. It was argued that further research direction is to apply another type of deep learning models such as Google's Inception and ResNet-v2 to deal with larger data sets.

It was clarified that diagnostics of autism is done via interview settings, not use of MRIs. The value for clinical support was not clear.

[B-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-025.docx): Proposal: Teledermatological Screening Solution via Mobile Devices (Fraunhofer Portugal)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was presented remotely. The project aims to improve the existing teledermatology screening processes through a mobile based solution and the usage of Artificial Intelligence.

Input: image on a phone; output: diagnostics. Public and private datasets.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑025‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-025-R1.docx).

[B-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-028.docx): Proposal: Using AI for early detection of diabetic retinopathy to prevent vision loss [Medindia.net]

This late submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). It describes an end-to-end AI based solution for screening, detection and diagnosis of Diabetic Retinopathy using digital images of the retina acquired using either a conventional fundus camera or a smartphone-based image capture device.

Current project uses retinal images as input and outputs a diagnosis equivalent to manual screening (low, medium, high). It was claimed that with early detection, retinopathy can be reversible. For this, time series would be needed (to train evolution of retinopathy), attention needed for the data collection process.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑028‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-028-R1.docx).

## Diagnostic sequential

[B-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-015.docx): Use-case for AI drive clinical decision support in primary health care for low- and middle-income countries [WhatIF, South Africa]

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was presented remotely and it describes the WatIF Health project as a use-case application for AI in primary health care for low resources communities.

The authors stated that they have data available for diabetes and hypertension, but need guidance. It was asked what are the inputs and outputs of the health problem under consideration. A need to curate a dataset that is not disclosed for testing purpose was emphasized. The submitter was encouraged to re-submit the proposal in response to the updated Call for Proposals in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx). It was agreed that this might be a suitable candidate for future work, and the author was encouraged to reformulate the proposal for consideration at the next FG meeting.

[B-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-019.docx): The Virtual Chronic Care Continuum (VC3): Remote vital signs monitoring and predictive algorithms for management of patients with chronic diseases (Care Innovation Corporation (CIC))

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was noted as the author was not at the meeting to present the document.

It remained unclear whether this use case refers to disease prevention or management. The group found the topic interesting but would need to know more about what the exact problems and benchmarking subjects would be, encouraging a submission at the next meeting with attendance of the authors, in response to the updated Call for Proposals in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx).

[B-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-021.docx): Proposal: Standardized benchmarking of diagnostic self-assessment apps (Ada Health)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). A project for the implementation of standardized benchmarking for diagnostic self-assessment applications was proposed.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑021‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-021-R1).

## Diagnostic mental health

[B-020-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-020-R1.docx): Developing flexible prediction models for new cases of substance use disorders with a focus on prescription opioid misuse from complex national survey mental health and substance abuse survey data (Columbia University, New York State Psychiatric Institute (NYSPI))

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document contains the summary of a possible project on applying AI models to develop more predictive tools for substance use disorders from nationally representative survey data, and proposes the development of assessment approaches for predicting substance use disorders, based on nationally representative survey data. This proposal seems related to prediction, not diagnosis.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑020‑R2](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-020-R2.docx).

[B-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-023.docx): Proposal: Use case for AI based depressive disorder assistance service (AI-DDAS) for teenagers (HUFS, Rep. of Korea)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The use case for AI-based depressive disorder assistance service (AI-DDAS) for teenagers was proposed. The document includes problem statements and the benchmarking issues to support AI based DDAS for teenager.

There was an extensive discussion on this proposal that was well received as such. However, it was remarked that the scoring was unclear, the number of participants in the studies was not specified. Phrasing of proposal is perhaps unclear but there does seem to be data points, but the participants were unsure of how much. It remained unclear what the target group is, particularly referring to the question of the ability to classify between depression and bipolar depression. It was suggested that the proposal could be more focused regarding the level of precision for this level of testing. Key criteria like sample size would need to be identified, as well as whether it is a cross-sectional study.

After intense discussions, participants at the meeting agreed to collaborate with the author(s) to further develop the proposal and have it submitted for next meeting in response to the updated Call for Proposals in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx).

[B-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-024.docx): Proposal: Classifying patients with depression using data from The Netherlands study of depression and anxiety (NESDA) (Leiden University)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was noted as the author was not available to present the document.

It was remarked that benchmarking would be to predict depression over time. It would be difficult for us to do anything beyond what they have because they have the public and undisclosed data, perhaps if there is other data out there, it can be combined. Authors invited to resubmit the proposal in response to the updated Call for Proposals in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx).

## Epidemiological

[B-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-022.docx): Proposal: Leveraging the power of computing to deliver effective, efficient and affordable healthcare to the most marginalized in HIV settings (Swasti)

This submission was provided in response to the ITU-T FG-AI4H's call for proposals on use cases and data [A‑102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-102docx). The document was noted after introduction by the chairman as the author was not available to present the document.

This project elicited several concerns: is it evidence-based and has plausible hypotheses? The variables listed would not be considered variables in several countries, with possibly unreliable / not useful predictors. Is enough data on predictors available? Are the categories proposed worthwhile to be predicted? Is this a research project or a practical use case? (The FG work should focus on practical cases).

[B-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-026.docx): Proposal: Multifactorial screening of fall risk in community-dwelling adults (Fraunhofer Portugal)

This document was presented remotely. This project aims to improve the screening of fall risk in community-dwelling adults. Data is currently private but could be split into public and private segments.

The group felt that the use case proposed is highly relevant for the FG work.

After presentation, the authors provided the answers to the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), as found in [B‑026‑R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-021-R1).

It was agreed that the FG should study how datasets could be split (see also the discussion of [B‑027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-027.docx) in §‎8.5).

## Data management

[B-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-011.docx): Updates on brainstorming - Data handling policy (Marc Lecoultre, Business Investigation)

This document proposes a preliminary outline of the data handling policy. Health data is one of the most valuable and sensitive types of data. Handling this kind of data is often associated with a strict and factual framework defined by data protection laws but may also involve emotional aspects; it is about biometric data that defines each of us, who we are, and how we have lived. It is important to set a strict data policy which will ensure confidence in FG-AI4H not only among contributors, but across all stakeholders. There are two major issues that the data handling policy should address:
a) compliance with regulations dealing with the use of personal health data; and
b) non-disclosure of the test datasets held by FG-AI4H for the purpose of model evaluation.

It was observed that the FG should not be concerned with data anonymization, this burden would be of the data set submitter based on its particular jurisdictional constraints.

After discussions, it was agreed to update the document, see [B-011-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-011-R1.docx). The latter was then reviewed and agreed to be issued as an output at this meeting. An ad hoc group was created to refine the document contents, aiming at finalization at the next FG meeting. See §‎10.3.

[B-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-016.docx): Proposal: Secure and privacy-preserving benchmarking for artificial intelligence in health (Lausanne University Hospital (CHUV), EPFL)

Artificial intelligence has the potential to revolutionize the field of healthcare in the next few years. Yet, its success highly depends on how AI algorithms for health are going to be benchmarked and regulated, as well as on the trust that people have that this process is safe and secure. This document outlines a proposal for a privacy-preserving benchmarking pipeline that leverages advanced privacy-enhancing technologies such as homomorphic encryption and distributed ledgers. Single point of failure should be avoided and multi-party secret keys should be used. The proposal suggests using permission blockchains instead of public blockchains.

The proposal was well received as a long-term strategy, but as the technology would require substantial adaptation on the part of algorithm developers (e.g. libraries supporting operation on a homomorphic encrypted space are not yet available), the FG-AI4H would investigate alternative approaches for the mid/short term.

[B-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-027.docx): Draft: Selection of representative training data for evaluation of ML algorithms (Fraunhofer-HHI)

This late contribution describes different approaches for the selection of representative training data from a large dataset. The goal of these selection methods is to ensure that ML algorithms show similar generalization properties when trained on the training data and the full data set.

This document elicited lots of interest and it was agreed to establish a test data set assessment ad hoc group to further the discussions and identify ways forward before the next FG meeting. See §‎10.3 for details.

## Analysis of proposals

After all presentations, the meeting assessed the maturity/clarity of the various proposals, noting that the problem-at-hand needs to be clearly communicated, so people who have never been to the meeting can understand the problem, opportunity, and what it needs to be solved.

Proposals were ranked as those needing re-work and those ready for further feasibility study by the group. For the latter, topic drivers were identified; the meeting agreed that proponents could take that role, if suitable.

After presentation by authors and discussions, the proposals in Table 1 were admitted for **further feasibility** studies.

Table 1 – Proposals in Table 1 admitted for further feasibility studies

| Document | Title | Topic driver |
| --- | --- | --- |
| [B-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-012.docx) | Snake identification based on imagery (Institute of Global Health, Faculty of Medicine, University of Geneva) | Rafael Ruis (University of Geneva) |
| [B-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-013.docx) | Mining medical data to understand Alzheimer's disease (Laboratory for Research in Neuroimaging, Department of Clinical Neurosciences, Faculty of Biology and Medicine, UNIL Centre Hospitalier Universitaire Vaudois) | Marc Lecoultre (MLlab.ai) |
| [B-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-014.docx) | Assessing breast cancer risk using imagery (Institute of Pathology, Charité Universitätsmedizin Berlin & Berlin Institute of Health & Berlin Big Data Center & Berlin Center for Machine Learning) | Frederick Klauschen (Charité Berlin) |
| [B-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-018.docx) | Autism classification using brain imagery (Columbia University) | Jongwoo Choi (Columbia University) |
| [B-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-021.docx) | Evaluating symptom checker apps (Ada Health) | Henry Hoffmann (Ada Health) |
| [B-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-025.docx) | Skin lesion diagnosis using imagery (Fraunhofer Portugal) | Maria Vasconcelos (Fraunhofer Portugal) |
| [B-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-026.docx) | Reducing risk of falling among elderly (Fraunhofer Portugal) | Inês Sousa (Fraunhofer Portugal) |
| [B-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-028.docx) | Detecting Diabetic Retinopathy via imagery (MedIndia.net) | Arun Shroff (MedIndia) |

Chairman stated that topic drivers are in charge of moving topics forward but emphasizes that they must focus on consensus. Similar to the work of the ad hoc groups (§‎10.4), they must produce a report of work done between meetings, including estimate number of emails exchanged, of phone calls, etc. to give an idea of work done. Every telephone conference should have meeting minutes, to be included in the overall report of work done between meetings.

The project groups will be virtual. Everyone should communicate via the mailing list of the FG. No private e-mail exchanges should be used if these are to be considered as part of the group process.

The documents in Table 2 were presented and discussed. While their topic areas were considered to be likely of relevance to the FG-AI4H work, it was felt that some improvement and clarification was needed before the proposals could be accepted for additional feasibility studies. Authors were invited to **resubmit their proposals at the next FG-AI4H meeting**.

Table 2 – Proposals reviewed for which improvements / clarifications were requested

| Document | Title |
| --- | --- |
| [B-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-015.docx) | Enhancing efficiency of primary health care in developing countries (hypertension and diabetes focus) (WatIF Health) |
| [B-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-020.docx) | Predictive models for substance abuse (Columbia University, New York State Psychiatric Institute) |
| [B-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-023.docx) | Identifying and monitoring depression in teenagers (Hankuk University of Foreign Studies) |

The following proposals were **noted** as the authors were not present:

* [FGAI4H-B-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-017.docx) "Providing patients with a biometric identifier" (Element Inc.)
* [FGAI4H-B-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-019.docx) "Monitoring vital signs to manage patients suffering chronic diseases" Care Innovation Corporation (CIC)
* [FGAI4H-B-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-022.docx) "Exploring HIV risk using targeted surveys" (Swasti)
* [FGAI4H-B-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-024.docx) "Epidemiological approach to understanding depression" (Leiden University)

The chairman noted that because some proposals were not presented by their submitters, the group was unable to consider them further. Authors were invited to re-submit their proposals at a future meeting, noting that they are expected to be available to present their document.

# Review of previous output documents

## Criteria for data acceptance

[B-003](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-003.docx) - Updated draft criteria for data to be accepted by the Focus Group (Chair WG-O)

The document was agreed as provided and issued as output document [B-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-103.docx). See also §‎12.

## Thematic classification scheme

[B-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-004.docx) - Draft thematic classification scheme (Chair WG-HR)

The document contains the same thematic classification as in [A-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-104.docx), for easier reference.

[B-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-029.docx) - Artificial Intelligence thematic classification (Marc Lecoultre (MLLab.ai))

This document suggests an Artificial Intelligence thematic classification to be used for Level 2 in document [B-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-004).

During discussions several doubts were raised: should machine learning be classified under AI? Would an IEEE or academic classification for Level 2 be more appropriate?

At this stage, the meeting decided to keep the thematic classification as in [A-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-A-104.docx) at this stage (reissued as [B-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-104.docx), see §‎12) and to refine the classification based on future contributions submitted. An ad hoc group was tasked with refining this document before the FG meeting in Lausanne, see §‎10.3 for details.

The Chairman noted that the group would not reject a proposal if it does not fit into a classification.

## Call for proposals

After review by the meeting, the document with the updated call for proposals: (use cases, benchmarking, and data in FGAI4H) in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx) was reposted as [B-031](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-031.docx) ([Draft] Updated Call for Proposals: use cases, benchmarking, and data), since it was agreed that the output document to be issued in [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx) would need to be refined (also considering the need to improve and to incorporate the questionnaire in [B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx), to be embedded into [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx), see §‎8, top clause).

The group agreed to the chairman proposal for a two-week review period for improving the text in [B-031](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-031.docx) and then issuing it on the website as [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx). See also §‎12.

# Future work

## Structure of the work items

The structure of the work items was not discussed at this meeting.

## Work plan and timeline

## Schedule of future FG meetings

The schedule of future meetings was reviewed as found in [B-005-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-005-R1.docx). The next two meetings are defined. Formal announcement for meeting C (Lausanne, Switzerland) is published in the ITU website and the announcement for meeting D (Shanghai, China) is forthcoming. The document also contains the schedule of future FG-AI4H meetings and ideas for possible countries. The Chairman noted that meetings E and F are tentative. Further updates will be provided in the FG-AI4H home page.

## Ad hoc groups

The following ad hoc groups were established at this meeting and will report at the next FG-AI4H meeting:

* **Data handling and data acceptance ad hoc group
Co-convenors:** Markus Wenzel (Fraunhofer-HHI, Germany; markus.wenzel@hhi.fraunhofer.de) / Marc Lecoultre (Business Investigation, Switzerland; ml@bigps.ai);
**Mandate:** discuss data policy of the FG and to deliver proposals for data handling / policy documents (merged as a single document). Identify where we need to be specific ("shall") and where we can be flexible ("should"). Discuss data encryption.
* **Test data set assessment ad hoc group
Co-convenors:** Wojciech Samek (Fraunhofer-HHI, Germany; wojciech.samek@hhi.fraunhofer.de) / Arun Shroff (MedIndia, India; arunshroff@gmail.com)
**Mandate:** evaluate methods of characterizing a test data set either through sub-sets/sub-samples or providing mathematical descriptions (distance, classes, etc.). Provide software tools to create datasets conforming to those descriptions.
* **Thematic classification scheme ad hoc group
Co-convenors:** Ramesh Krishnamurthy (WHO; krishnamurthyr@who.int) / Daidi Zhong (Chongqing University, China; daidi.zhong@ieee.org)/ Leanne Currie (University of British Columbia, Canada; leanne.currie@ubc.ca)
**Mandate:** revise B-104 and deliver final Thematic classification scheme.

The ad hoc groups were given the following general guidance:

* Relevant communication is carried out over the e-mail reflector fgai4h@lists.itu.int (not by private e-mail exchanges);
* Conference calls cannot be on major holidays and are announced one week in advance (on the e-mail reflector);
* Arranged at a time convenient for all interested participants (also considering the "pain-sharing" principle);
* The AHG must deliver a report for the next FG meeting containing of its consensus proposals among other information (list of documents exchanged and their availability; number and name of participants; number and date of calls; etc.);
* The FG will review the consensus proposals at its next meeting and may adopt them.

# Administrative matters

If group members have a question regarding a document, they are to send their question(s) to the FG-AI4H mailing list (fgai4h@lists.itu.int). The secretariat can assist in case of doubts, tsbfgai4h@itu.int.

# Outcomes of this meeting

The following output documents were approved by the FG-AI4H meeting:

|  |  |
| --- | --- |
| [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx) | Updated Call for Proposals: use cases, benchmarking, and data  |
| [B-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-103.docx) | Updated draft criteria for data to be accepted by the FG-AI4H |
| [B-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-104.docx) | Draft thematic classification scheme |
| [B-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-105.docx) | Draft FG-AI4H data handling policy |

The meeting also agreed with the chairman proposal for a two-week review period for improving the text in [B-031](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-031.docx) before issuing it on the website as [B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx).

# Updates to the management team and working groups

The group agreed to the appointment of Ms Naomi Lee (The Lancet, UK) as FG Vice-chairman.

The idea to create a WG on Regulation and adoption (WG-RA) was postponed till Meeting C. In the meantime, a suitable chairman and vice-chairman would be identified for confirmation in Meeting C, along with the ToR for the WG.

# A.O.B.

No other business was brought forth.

# Closing

The chairman thanked the various institutes in Columbia University that provided the excellent facilities and support for this meeting: Department of Biomedical Informatics, School of Nursing, Data Science Institute, Center for Health Analytics, Center for Computing Systems for Data-Driven Science, Center for Evidence-based Practice Columbia, NY State Psychiatric Institute.

He also thanked all the participants for their contribution and enthusiasm and the FG management for their continued support before and during the meeting. He invited all to spread the word about the group and the work planned ahead and hoped to see all participants at the next meeting in Lausanne, Switzerland, 22-25 January 2019.

The meeting closed at 1610 hours EST.

Annex A:
Documentation

| Document | Title | Source |
| --- | --- | --- |
| [FGAI4H-B-001-R2](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-001-R2.docx) | Proposed agenda of the second meeting ("Meeting B") of the Focus Group on Artificial Intelligence for Health (FG-AI4H) | Chairman FG-AI4H |
| [FGAI4H-B-002](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-002.pptx) | Workshop summary | Chairman FG-AI4H |
| [FGAI4H-B-003](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-003.docx) | Updated draft criteria for data to be accepted by the Focus Group | Chairman WG-O |
| [FGAI4H-B-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-004.docx) | Draft thematic classification scheme | Co-chairman WG-HR |
| [FGAI4H-B-005](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-005.docx) | Future meetings – draft plan (save the dates) | Chairman FG-AI4H |
| [FGAI4H-B-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-006.docx) | Proposal submission questionnaire | FG-AI4H |
| [FGAI4H-B-010-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-010.docx) | Documentation for the FG-AI4H meeting B (New York, 15-16 Nov. 2018) | TSB |
| [FGAI4H-B-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-011.docx) | Updates on brainstorming - Data handling policy | Marc Lecoultre (MLLab.ai) |
| [FGAI4H-B-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-012.docx) | Proposal: First medical decision‐support tool for snake identification based on artificial intelligence and remote collaborative expertise | Institute of Global Health, Faculty of Medicine, University of Geneva |
| [FGAI4H-B-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-013.docx) | Proposal: Using machine learning and AI for validation of Alzheimer's disease biomarkers for use in the clinical practice | Laboratory for Research in Neuroimaging, Department of Clinical Neurosciences, Faculty of Biology and Medicine, UNIL Centre Hospitalier Universitaire Vaudois (CHUV) |
| [FGAI4H-B-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-014.docx) | Proposal: Machine learning-based profiling of tumor-infiltrating lymphocytes in breast cancer | Institute of Pathology, Charité Universitätsmedizin Berlin & Berlin Institute of Health & Berlin Big Data Center & Berlin Center for Machine Learning |
| [FGAI4H-B-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-015.docx) | Use-case for AI drive clinical decision support in primary health care for low- and middle-income countries | WatIF Health |
| [FGAI4H-B-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-016.docx) | Proposal: Secure and privacy-preserving benchmarking for artificial intelligence in health | Lausanne University Hospital (CHUV), EPFL |
| [FGAI4H-B-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-017.zip) | Proposal: A mobile AI approach to biometric identity | Element Inc. |
| [FGAI4H-B-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-018.docx) | Classification of autism spectrum disorder based on brain image using convolutional neural networks | Columbia University |
| [FGAI4H-B-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-019.docx) | The Virtual Chronic Care Continuum (VC3): Remote vital signs monitoring and predictive algorithms for management of patients with chronic diseases | Care Innovation Corporation (CIC) |
| [FGAI4H-B-020-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-020-R1.docx) | Developing flexible prediction models for new cases of substance use disorders with a focus on prescription opioid misuse from complex national survey mental health and substance abuse survey data | Columbia University, New York State Psychiatric Institute (NYSPI) |
| [FGAI4H-B-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-021.docx) | Proposal: Standardized benchmarking of diagnostic self-assessment apps | Ada Health |
| [FGAI4H-B-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-022.docx) | Proposal: Leveraging the power of computing to deliver effective, efficient and affordable healthcare to the most marginalized in HIV settings | Swasti |
| [FGAI4H-B-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-023.pdf) | Proposal: Use case for AI based depressive disorder assistance service (AI-DDAS) for teenagers | Hankuk University of Foreign Studies (HUFS) |
| [FGAI4H-B-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-024.docx) | Proposal: Classifying patients with depression using data from The Netherlands study of depression and anxiety (NESDA) | Leiden University |
| [FGAI4H-B-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-025.docx) | Proposal: Teledermatological Screening Solution via Mobile Devices | Fraunhofer Portugal |
| [FGAI4H-B-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-026.docx) | Proposal: Multifactorial screening of fall risk in community-dwelling adults | Fraunhofer Portugal |
| [FGAI4H-B-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-027.docx) | Draft: Selection of representative training data for evaluation of ML algorithms | Fraunhofer HHI |
| [FGAI4H-B-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-028.docx) | Proposal: Using AI for early detection of Diabetic Retinopathy to prevent vision loss | Medindia.net |
| [FGAI4H-B-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-029.docx) | Artificial Intelligence thematic classification | Marc Lecoultre (MLLab.ai) |
| [FGAI4H-B-030](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-029.docx) | List of coding systems for describing the datasets for the FG-AI4H | Chongqing University |
| [FGAI4H-B-031](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-031.docx) | [Draft] Updated Call for Proposals: use cases, benchmarking, and data | Editor |
| [FGAI4H-B-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-019.docx)\* | Report of the FG-AI4H meeting B (New York City, 15-16 November 2018) | FG-AI4H |
| [FGAI4H-B-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-102.docx)\* | Updated Call for Proposals: use cases, benchmarking, and data | FG-AI4H |
| [FGAI4H-B-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-103.docx) | Updated draft criteria for data to be accepted by the FG-AI4H | FG-AI4H |
| [FGAI4H-B-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-104.docx) | Draft thematic classification scheme | FG-AI4H |
| [FGAI4H-B-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-B-105.docx) | Draft FG-AI4H data handling policy | FG-AI4H |

\* To be posted on the website after a 2-week review.

Annex B:
Participants

| Title | Last Name | First Name | Job Title | Entity | Country | 14 Nov. | 15 Nov. | 16 Nov. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mr | Angiolillo | John | Postdoctoral Fellow | CUIMC Dept Biomed Informatics | USA | Physically | Physically |  |
| Mr | Arumugam | Siddarth | Graduate Research Assistant | Columbia University | USA | Physically |  |  |
| Ms | Averitt | Amelia | PhD Cand. Biomedical Informatics | Columbia University | USA |  |  | Physically |
| Mr | Baird | Pat | Head of Software Standards | Philips | USA |  | Physically | Physically |
| Ms | Bakken | Suzanne | Professor | Columbia University | USA | Physically | Physically | Physically |
| Mr | Balachandran | Pradeep | Technology Consultant e-health standards | Individual | Switzerland | Remote | Remote | Remote |
| Mr | Bang | Isaac | Project Manager | Mind AI | USA | Physically | Physically |  |
| Ms | Bucknall | Tracey | Professor | Deakin University | Australia | Physically | Physically | Physically |
| Mr | Calderon | Juan Carlos | ICT Consultant | ICT Consultant | Colombia | Physically |  |  |
| Mr | Campos | Simão | Counsellor | ITU | Switzerland | Physically | Physically | Physically |
| Mr | Cha | Jiook | Assistant Professor | Columbia University | USA | Physically |  |  |
| Mrs | Choi | Jeeyae | Professor | University of North Carolina Wilmington | USA | Remote |  |  |
| Mr | Chong | Ilyoung | Professor | Hankuk University of Foreign Studies | Korea (Rep. of) | Physically | Physically | Physically |
| Mr | Co Jr. | Manuel | Adjunct Professor | Montclair State University | USA |  | Physically | Physically |
| Mr | Cuenat | Alexandre | Expert in Residence | Wellcome Trust | GB | Remote | Remote | Remote |
| Ms | Currie | Leanne | Associate Professor | University of British Columbia | Canada | Physically | Physically | Physically |
| Ms | Cyr | Marilyn | Postdoctoral Research Scientist | New York State Psychiatric Institute | USA | Physically | Physically |  |
| Ms | Dabiri | Ayda | Project Officer | ITU | Switzerland | Physically | Physically | Physically |
| Mr | Decorzent | Jean-Baptiste | VP Global Alliance & Partnership | HX Foundation | Switzerland | Physically | Physically | Physically |
| Mr | Doe | John | Chief Scientist | Mind AI | USA | Physically | Physically |  |
| Ms | Dong | Ran | Researcher | Columbia University | USA | Physically |  |  |
| Mr | ElZarrad | M Khair | Deputy Director, Office of Medical Policy | U.S. Food and Drug Administration | USA | Physically |  |  |
| Mr | Ferrante | Michele | Program Officer | NIH | USA | Physically |  |  |
| Ms | Gachuhi | Noni | Women's Health Lead | Intellectual Ventures | USA | Remote |  |  |
| Ms | Galilea | Gabriela | CEO and Founder | Okimo Vision | Paraguay | Physically |  |  |
| Mr | He | Xiaofu | Assistant Professor | Columbia University | USA | Physically | Physically | Physically |
| Mr | Hoffmann | Henry | Director of Research | Ada Health GmbH | Germany | Physically | Physically | Physically |
| Mr | Hripcsak | George | Chair, Dep. Biomedical Informatics | Columbia University | USA | Physically |  | Physically |
| Mr | Huang | Rui | - | Mailman School | USA |  | Physically |  |
| Mr | Ibaraki | Stephen | Social Entrepreneur and Futurist - Chair REDDS Capital | REDDS Venture Capital | Canada | Physically | Physically | Physically |
| Mr | Ikeda | Yoshikazu | - | Otani University | Japan | Remote |  |  |
| Mr | Jackson | Mark | Scientific Lead of Business Development | Cambridge Quantum Computing | GB |  | Physically |  |
| Mr | Kawamori | Masahito | Project Professor | Keio University | Japan | Physically | Physically |  |
| Mr | Kherif | Ferath | Senior Lecturer | University of Lausanne | Switzerland |  | Remote |  |
| Ms | Kim | Jiyoung | - | SNUH | Korea (Rep. of) | Physically | Physically | Physically |
| Mr | Kim | Minjae | Assistant Professor | Columbia University | USA | Physically |  |  |
| Mr | Kofmel | Erich | President | Autistic Minority International | Switzerland | Remote |  |  |
| Mr | Krishnamurthy | Ramesh | - | WHO | Switzerland |  | Remote | Remote |
| Mrs | Kuglitsch | Monique | Innovation Manager | Fraunhofer-HHI | Germany | Physically | Physically | Physically |
| Mr | Kühn | Andreas | Medical Content Editor | Ada Health GmbH | Germany | Physically | Physically | Physically |
| Mr | Kumar | Manish | Senior Technical Specialist | MEASURE Evaluation, UNC at Chapel Hill | USA | Remote |  |  |
| Mr | Launay | Laurent | R&D Manager | IRT b<>com | France | Physically | Physically | Physically |
| Mr | Lecoultre | Marc | Founder | Business Investigation | Switzerland | Physically | Physically | Physically |
| Ms | Lee | Jihui | Postdoctoral Associate | Weill Cornell Medicine | USA |  | Physically |  |
| Ms | Lee | Jihui | Postdoctoral Associate | Weill Cornell Medicine | USA | Physically |  |  |
| Mr | Lee | Jung Hwan Paul | CEO | Mind AI | Korea (Rep. of) |  | Physically |  |
| Mr | Lee | Jung Hwan Paul | CEO | Mind AI | Korea (Rep. of) | Physically |  |  |
| Ms | Lee | Naomi | Executive Editor - Digital | The Lancet | GB | Physically |  |  |
| Mrs | Lucchini | Maristella | Post Doc | Columbia University | USA | Physically |  |  |
| Ms | Lyudovyk | Olga | Researcher | Columbia University | USA | Physically |  |  |
| Ms | Martin | Kathryn | Director | Access Partnership | USA |  | Physically | Physically |
| Mr | Marzouki | Kirmene | Researcher | SPIKE-X | Tunisia | Physically | Physically | Physically |
| Mr | McCarthy | Odhran | Senior Fellow | UNICRI | Italy | Remote |  | Remote |
| Ms | McGinty | Geraldine B. | Chief Strategy and Contracting Officer | Weill Cornell Medicine | USA | Physically |  |  |
| Ms | Medeiros | Donna | Senior Digital Health Architect | Asian Development Bank | Philippines | Physically |  |  |
| Mr | Mehta | Mehul | Senior Fellow and Clinical Instructor in | Harvard Global Health Institute | USA | Physically |  |  |
| Mr | Minevich | Mark | Advisor/Digital Fellow to CEO and Executive Chairman of AI Pioneers Forum | IPsoft | USA | Physically |  |  |
| Mr | Muthambi | Benjamin | - | Watif Health | South Africa |  |  | Remote |
| Mr | Ndansi | Elvis | Obama Scholar | Columbia World Project | USA | Physically | Physically |  |
| Mr | Norman Sipula | Nao | CEO and Founder | Watif Health | South Africa |  |  | Remote |
| Mr | Omanakutty Nair | Vishnu Ram | Consultant | Individual | India | Remote |  | Remote |
| Mr | Park | Ji Hwan | Research Associate | Brookhaven National Lab | USA | Physically | Physically | Physically |
| Mr | Pe'er | Itsik | Professor | Columbia University | USA | Physically |  |  |
| Mr | Perotte | Adler | Assistant Professor | Columbia University | USA | Physically | Physically | Physically |
| Ms | Perotte | Rimma | - | New York Presbyterian Hospital | USA | Physically |  |  |
| Mr | Pini | Nicolo | PhD student | Columbia University Medical Center | USA | Physically |  |  |
| Mr | Pujari | Sameer | Technical Officer and Manager mHealth for NCDs: Be Healthy Be Mobile Initiative | WHO | Switzerland | Physically | Physically | - |
| Mr | Quast | Bastiaan | - | ITU | Switzerland | Physically | Physically | Physically |
| Mr | Raisaro | Jean Louis | Post-doctoral researcher | Lausanne University Hospital | Switzerland | Physically | Physically |  |
| Ms | Razavian | Narges | Assistant Professor, Departments of Radi | NYU Langone Health | USA | Physically |  |  |
| Ms | Reddy | Archana | Strategic Regulatory Advisor/Public Heal | Individual | USA | Physically |  |  |
| Mr | Ruiz de Castaneda | Rafael | Head of One Health Unit | Université de Genève | Switzerland | Physically | Physically | Physically |
| Mr | Sajda | Paul | Professor of Biomedical Engineering, Electrical Engineering and Radiology | Columbia University | USA | Physically |  |  |
| Mr | Salathé | Marcel | Professor EPFL | EPFL | Switzerland | Physically | Physically | Physically |
| Mr | Samek | Wojciech | Head of Machine Learning Group | Fraunhofer HHI | Germany | Physically | Physically | Physically |
| Ms | Scarioni | Beatrice | Project Collaborator, EPFL Tech4Impact | EPFL | Switzerland | Physically | Physically | Physically |
| Ms | Schwalbe | Nina | Adjunct Assistant Professor of Population and Family Health | Columbia University | USA | Physically | Physically | Physically |
| Mr | Shapiro | Ofer | Managing Member | Real Life Innovations | USA | Physically | Physically |  |
| Mr | Shroff | Arun | Director of Technology | MedIndia | USA | Physically | Physically | Physically |
| Mrs | Simpson | Blair | VC for Research & Prof of Psychiatry | CUMC/NYSPI | USA | Physically |  |  |
| Mr | Sofiadellis | Foti | - | Royal Australasian College of Surgeons | GB | Remote | Remote | Remote |
| Mr | Sofiadellis | Vasileos | CEO / Founder | Visions2Ventures | South Africa | Remote |  |  |
| Mrs | Sousa | Inês | Head of Intelligent Systems | Fraunhofer Portugal | Portugal | Remote |  | Remote |
| Mr | Syed Abdul | Shabbir | Professor | Indian Association of Medical Informatics | India | Physically | Physically | Physically |
| Mrs | Tascau | Liana | Scientific Worker / Student | Columbia University Medical Center | USA |  | Physically |  |
| Ms | Thomas Massiongale | Tresa | Chief Investment & Partnership Officer | Bloodworks Northwest | USA | Physically |  |  |
| Mr | Topaz | Max | Assoc. Prof. at Data Science Institute and Irving Medical Center | Columbia University | USA |  | Physically |  |
| Mrs | Vasconcelos | Maria | - | Fraunhofer Portugal | Portugal | Remote |  | Remote |
| Ms | Wall | Melanie | Professor of Biostatistics | New York State Psychiatric Institute | USA | Physically | Physically |  |
| Mr | Wang | Yuanjia | Professor of Biostatistics | Columbia University | USA | Physically |  |  |
| Mr | Wenzel | Markus | Research Associate | Fraunhofer-HHI | Germany | Physically | Physically | Physically |
| Mr | Wiegand | Thomas | Executive Director | Fraunhofer-HHI | Germany | Physically | Physically | Physically |
| Mr | Xu | Dongrong | Associate Professor | Johns Hopkins University Applied Physics Laboratories | USA |  | Physically | Physically |
| Mrs | Yakubova | Nafissa | Visiting Researcher | Facebook | USA | Physically | Remote |  |
| Mr | Yoo | Shinjae | Computational Scientist | Brookhaven National Lab | USA | Remote |  |  |
| Mr | Zhong | Daidi | - | Chongqing University | China | Physically | Physically | Physically |

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