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ITU-T Focus Group on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (FG-AI4EE)

FG-AI4EE D.WG1-01

Standardized glossary of terms

Working Group 1: Requirements of AI and other Emerging Technologies to Ensure Environmental Efficiency

Focus Group Technical Report

Technical Report ITU-T FG-AI4EE D.WG1-01

Standardized glossary of terms

Summary

This Technical Report is a deliverable of the ITU-T Focus Group on Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (FG-AI4EE).

It contains a baseline set of definitions of terms commonly used in the context of Environmental Efficiency for Artificial Intelligence and other Emerging Technologies. The definitions provide a basic characterization of the term, and where appropriate a note is included to provide additional clarity. The concept and rationale for some of the key terms and definitions shall be described in Clause 7.

Keywords:

Terminology; glossary; definitions

Note

This is an informative ITU-T publication. Mandatory provisions, such as those found in ITU-T Recommendations, are outside the scope of this publication. This publication should only be referenced bibliographically in ITU-T Recommendations.

Change Log

This document contains Version 1.0 of the ITU-T Technical Report on "*Standardized glossary of terms*" approved at FG-AI4EE sixth meeting held in Ålesund, Norway, 1-2 December 2022.

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Standardized glossary of terms

1 Scope

This document contains a dictionary of common terms and phrases used in the Focus Group's deliverables that will help readers to have common definitions and frames of reference.

To aid understanding of papers submitted within the Focus Group, a glossary of terms has been created to aid readability. Each definition covers the term itself, and any illustration, mathematical or otherwise to enable understanding of the term used. Where terms are already standardized within the industry, a reference will refer to the underlying defined term.

The terms contained in this document are for the deliverables listed in the table below:

Type	**Number**	**Title**
Technical Report	FG-AI4EE D.WG1-02	Solution scorecard for eco-friendly business processes and environmental behavioral influencers
Technical Specification	FG-AI4EE-D.WG1-04	Key performance indicators for small and medium enterprises to assess the achievement of sustainable development goals
Technical Specification	FG-AI4EE-D.WG1-05	Reporting artificial intelligence, augmented reality and machine learning
Technical Specification	FG-AI4EE D.WG1-06	Neutral navigational matrix for AI-driven technologies for smart sustainable cities
Technical Report	FG-AI4EE D.WG1-08	Driving artificial intelligence-Internet of things towards the United Nations Sustainable Development Goals
Technical Report	FG-AI4EE-D.WG1-09	A method for intuitive human interaction with data model (ML and AI, etc.)
Technical Report	FG-AI4EE-D.WG1-10	Guidelines on the use of digital twins of cities and communities for better climate change mitigation solutions
Technical Report	FG-AI4EE-D.WG1-11	Best practices for graphical digital twins of smart cities
Technical Specification	FG-AI4EE-D.WG2-01	Environmental impact self-check assessment
Technical Report	FG-AI4EE-D.WG2-02	Computer processing, data management and energy perspective
Technical Report	FG-AI4EE-D.WG2-03	Requirements on energy efficiency measurement models and the role of AI and big data
Technical Report	FG-AI4EE-D.WG2-04	Effective use cases of artificial intelligence for smart sustainable cities
Technical Specification	FG-AI4EE-D.WG2-05	Guidelines on energy efficient blockchain systems

Type	Number	Title
Technical Report	FG-AI4EE-D.WG2-06	Assessing environmentally efficient data centre and cloud computing in the framework of the UN sustainable development goals
Technical Report	FG-AI4EE-D.WG3-01	Guidelines on the implementation of eco-friendly criteria for AI and other emerging technologies
Technical Report	FG-AI4EE-D.WG3-02	Smart energy saving of 5G base stations: Based on AI and other emerging technologies to forecast and optimize the management of 5G wireless network energy consumption
Technical Report	FG-AI4EE-D.WG3-03	Data centre energy-saving: Application of Al technology in improving energy efficiency of telecom equipment rooms and Internet data centre infrastructure
Technical Report	FG-AI4EE-D.WG3-05	Best practice catalogue on environmentally efficient artificial intelligence and blockchain application
Technical Report	FG-AI4EE-D.WG3-06	Guidelines on the environmental efficiency of 5G usage in smart water management
Technical Report	FG-AI4EE-D.WG3-07	Guidelines on the environmental efficiency of machine learning processes in supply chain management

2 References

None.

3 Terms and definitions

3.1 Terms defined elsewhere

Terms defined elsewhere are listed in clause 7.2

3.2 Terms defined here

Terms defined here are listed in clause 7.1

4 Abbreviations and acronyms

The Focus Group uses the following abbreviations and acronyms:

4G 4th Generation of Wireless networks

5G 5th Generation of wireless networks

AA Autonomous Agents

AAU Active Antenna Unit

ACU Air Conditioning Unit

AI Artificial Intelligence

AI4PV Artificial Intelligence for the operation and maintenance of PhotoVoltaic plants

AIDEMAS AI-enabled demand-side management for energy sustainability

AIS Automatic Identification System

AISSI Integrated stand-alone programming for the semiconductor industry

API	Application Programming Interface
AQI	Air Quality Index
AR	Augmented Reality
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BA	Building Automation
BERT	Bidirectional Encoder Representations from Transformers
BIM	Building and road information
BMS	Building Management System
BS	Base Station
CFRP	Carbon Fibre Reinforced Polymers
CDP	Customer Data Platform
CEO	Chief Executive Officer
CFD	Computational Fluid Dynamics
CFO	Chief Financial Officer
CIRCLES	Congestion Impact Reduction via CAV-in-the-loop Lagrangian Energy Smoothing
COO	Chief Operating Officer
CSO	Chief Sustainability Officer
DC	Data Center
DCIE	Data Center Infrastructure Equipment
DCIM	Data Center Infrastructure Management
DEFAINE	AI-based design exploration framework for direct loaded engineering
DEM	Domestic Energy Model
DLT	Distributed Ledger Technology
DNN	Deep Neural Network
DRL	Deep Reinforcement Learning
DVFS	Dynamic voltage/frequency scaling
eCPRI	enhanced Common Public Radio Interface
EEI	Energy Efficiency Indicator
EPA	Environmental Protection Agency
EPR	Extender Producer Responsibility
ESG	Environmental, Social and Governance
FPGA	Field-Programmable Gate Array
GB	Gigabyte (Unit of storage on a computer)
GCA	Global Cybersecurity Agenda
GGBR	Global Green Building Research
GHG	Greenhouse Gas
GPT-3	Generative Pre-trained Transformer 3

GPU	Graphical Processing Unit
GSMA	Global System for Mobile Communications Association
H-IoT	Healthcare Internet of Things
HR	Human Resources
HVAC	Heating, Ventilation, and Air Conditioning
ICTs	Information and Communication Technologies
IDC	Internet Data Center
IDS	Intrusion Detection system
IEC	International Electrotechnical Commission
IoMT	Internet of Medical Things
IOT	Internet of Things
ISO	International Organization for Standardization
IT	Information Technology
ITS	Intelligent Transportation Systems
IVS	Seismic vulnerability index
IUCN	International Union for Conservation of Nature
KYC	Know your customer
KPI	Key Performance Indicator
LSTM	Long Short Term Memory
M2M	Machine to Machine
MEC	Mobile Edge Computing
MIMO	Multiple Input Multiple Output
ML	Machine Learning
MNO	Mobile Network Operator
NFT	Non-Fungible Token
NLP	Natural Language Processing
NIST	National Institute of Standards and Technology
NR	New Radio
NSA	Not Stand Alone
NYSDOT	New York Department of Transport
OLT	Optical Line Termination
ONU	Optical Network Unit
OSAT	Open Source Appropriate Technology
P2P	Peer-to-peer
PBFT	Practical Byzantine Fault Tolerance
PFAS	Polyfluoroalkyl Substances
PoA	Proof of Authority

PoW Proof of Work
PoS Proof of Stake
PoUW Proof of Useful WOrk
PON Passive Optical Networks
PRB Physical Resource Block
PUE Power Usage Effectiveness
R&D Research and Development
RDD Resilient Distributed Dataset
SCM Supply Chain Management
SDN Software Defined Networking
SDG Sustainable Development Goals
SSC Smart Sustainable City
SG Smart Grid
SGD Stochastic Gradient Descent
SGX Software Guard Extension
TDAI Trusted Decentralized Artificial Intelligence
TFEE Total Factor Energy Efficiency
TPU Tensor Processing Unit
TQEM Total Quality Environmental Management
U4SSC United for Smart Sustainable Cities
UAV Unmanned Autonomous Vehicles
UNOSAT The United Nations Satellite Centre
WAN Wide Area Network
V2G Vehicle-to-Grid
V2I Vehicle-to-infrastructure
V2V vehicle-to-vehicle
VOC Volatile Organic Compound
ZEB Zero Energy Building

5 Conventions

CO_2 Carbon Dioxide, a potent greenhouse gas
CO_2e Carbon Dioxide Equivalent
NOx Nitrogen Oxides
PMx Particulate Matter
SO_2 Sulphur dioxide
SOx Sulphur Oxides
uCM micro-climate and air pollution assessment in an urban setting

6 Key points and rationale for the Focus Group

6.1 Introduction

The use of data has evolved into a major and often critical element of our daily lives, irrespective of individual, business, or governmental use. The use of digital stored data by humans has driven us to a point where at the end of 2020, there was an estimated 64 Zettabytes (64'000'000'000'000'000'000 bytes) of data in created, copied or consumed worldwide, which is estimated to ramp to over 181 Zettabytes in 2025 [b-1]. In addition, there were an estimated 9 billion Internet of Things (IoT) devices in 2020, which will double by 2025[b-2]. Compute power growth was an estimated 2x increase year on year.

Combining the volume, veracity, and velocity of data with the evolution of computing power has enabled the field of AI to flourish to where, as of 2022, AI has superseded the capabilities of human intelligence for a great many tasks.

In many areas, statistical learning has now been superseded by deep neural networks, due to their predictive and generative capabilities which improve with larger volumes of data, albeit with diminishing returns aligned to compute power needed.

AI, more recently driven by subsets Machine Learning (Statistical Learning Models) and Deep Learning (Deep Artificial Neural Networks), has evolved into a double-edged sword when evaluated from an environmental efficiency perspective.

6.2 Energy consumption challenges created through the use of AI

From an environmental perspective, immense energy consumption is now required to train current state of the art large Deep Artificial Neural Networks. For example, in 2020, the carbon dioxide (CO_2) production for a car through its lifetime has been measured as a fifth of the CO_2 produced in training the latest large scale NLP transformer models once, albeit the trained model uses little consumption for Inferencing [b-3]. These trained models often enable higher performance than human decision-making accuracy in an increasing number of tasks.

Current algorithms used in Deep Learning often dictate that larger models offer improved accuracy, albeit with diminishing returns in terms of energy consumption. The growth in model size was in the region of 300,000 times between 2012 and 2018. While this may sound extreme, it should be considered that OpenAI's GPT-2 in 2019 had 1.5 billion parameters, its successor GPT-3 now has 175 billion parameters, and there is no sign of model growth slowing down in the continual pursuit of perfection [b-4]. It is very likely that the soon to be released GPT-4 model will continue this growth trend.

6.3 Offsetting the energy consumption challenges

AI has the capability to drive a positive environmental impact on many aspects of society, particularly since 2010, when Deep Artificial Neural Networks entered the mainstream phase of evolution. Deep Artificial Neural Networks have created the ability to enable increasingly accurate predictive and generative modelling on colossal data sets generated through both static, dynamic and IoT data. Whereas statistical AI models pre-2010 hit an artificial accuracy ceiling, irrespective of training data, post-2010 Deep Learning models have created the ability to drive increasingly higher accuracy through use of increasing quantities and variety of data from multiple sources.

The sheer size of current Deep Learning models and their widespread adoption would appear to create additional environmental energy consumption issues through increased adoption. However, the portability of open-sourced trained models has enabled business of all sizes to fine tune models with their own data. This is with very little environmental impact, using low-cost compute.

When considering how AI can create a positive environmental impact on society, generating AI models using data from disparate IoT data sources has enabled the evolution of smart data centres

and smart cities, to name two examples, which both have the potential to significantly reduce carbon footprint. The use of smart data centres is self-fulfilling, where AI models can reduce power consumption overheads through creating the optimal environment for IT to run efficiently. The use of digital twins enables smart cities to be created, which can deliver a significant positive impact on the environment. The outcome of using AI to train models on infinite scenarios in the digital twin using real world data can be used to enable a reduction of carbon footprint and improvement in air quality in the smart city.

6.4 Sustainable development outcomes

AI, in particular the Deep Learning subset, continues to evolve at a pace where human level performance is being surpassed at an increasing rate for specific tasks. Essentially, more data and more performance mean bigger and more accurate models which, when combined with IoT, drives more data, demanding more compute power, requiring larger models to improve performance. This on one hand brings environmental challenges. However, the combination of compute, data and IoT to drive increasingly accurate outcomes offers the ability to address environmental challenges, which can only be tackled by the capabilities generated by AI now at our disposal.

This focus group has aimed to offer both technical reports and specifications as referenced in part 1, scope of focus group deliverables, to address the challenges described in section 6 above.

7 Terms and definitions

7.1 Terms defined here

7.1.1 The following terms used in this Technical Report are defined below:

7.1.1.1 **Inferencing:** The use of a fully trained AI model to make predictions or generate new output.

7.1.2 The following terms are based on definition given in the Focus Group deliverables:

7.1.2.1 **Building Automation [b-2021-FG-AI4EE D.WG3-03]:** The automatic centralized control of a building's HVAC (heating, ventilation and air conditioning), electrical, lighting, shading, Access Control, Security Systems, and other interrelated systems through a Building Management System (BMS) or Building Automation System (BAS).

7.1.2.2 **Solution Scorecard [b-2021-FG-AI4EE D.WG1-02]:** Scorecard is defined as a list or series of lists that provide either a quantitative or qualitive value for consumption in rating of self or processes of a company.

7.2 Terms defined elsewhere

The following industry standard terms as defined in Focus Group deliverables are below:

7.2.1 Focus Group specific industry defined terms

7.2.1.1 **Consensus mechanism [b-2021-FG-AI4EE D.WG2-05]:** Defines strict rules for creating new blocks and adding new data to them without favouring one participant over another.

7.2.1.2 **Cryptography [b-2021-FG-AI4EE D.WG2-05]:** Originated from safety communication technology, which is a combination of mathematics, computer, and information theory.

7.2.1.3 **Data Center Infrastructure Management [b-2021-FG-AI4EE D.WG3-03]:** Integration of information technology (IT) and facility management disciplines to centralize

monitoring, management, and intelligent capacity planning of a data center's critical systems.

7.2.1.4 **Distributed ledger [b-2021-FG-AI4EE D.WG2-05]:** A type of ledger that is shared, replicated, and synchronized in a distributed and decentralized manner.

7.2.1.5 **Electrical energy efficiency [b-ITU-T L.1315]:** The output of a device that is generated by a provided amount of power; the percentage of total energy input to a machine or equipment that is consumed in useful work and is not wasted as useless heat.

7.2.1.6 **Energy carrier [b-ISO/IEC 13273-1]:** The substance or medium that can transport energy.

7.2.1.7 **Energy consumption [b-ISO/IEC 13273-1]:** The quantity of energy applied.

7.2.1.8 **Energy efficiency [b-ISO/IEC 13273-1]:** The ratio or other quantitative relationship between an output of performance, service, goods or energy, and an input of energy.

7.2.1.9 **Energy efficiency improvement [b-ISO/IEC 13273-1]:** An increase in energy efficiency that comes from technological, design, behavioural or economic changes**.**

7.2.1.10 **Energy efficiency indicator [b-ISO/IEC 13273-1]:** The value indicative of the energy efficiency.

7.2.1.11 **Energy efficiency mechanism instrument [b-ISO/IEC 13273-1]:** The means that are used to create incentives or a supportive framework for market actors to follow an energy efficiency improvement programme or to provide energy efficiency services.

7.2.1.12 **Energy intensity [b-ISO/IEC 13273-1]:** The total energy consumption per unit of economic output.

7.2.1.13 **Energy management system [b-ISO/IEC 13273-1]:** A set of interrelated or interacting elements to establish an energy policy and energy objectives, as well as the processes to achieve those objectives.

7.2.1.14 **Energy performance [b-ISO/IEC 13273-1]:** Measurable results related to energy efficiency, energy use and energy consumption.

7.2.1.15 **Energy policy [b-ISO/IEC 13273-1]:** The statement by the organization of its overall intentions and direction of an organization related to its energy performance, as formally expressed by its top management.

7.2.1.16 **Energy source [b-ISO/IEC 13273-1]:** Material, natural resource or technical system from which energy can be extracted or recovered.

7.2.1.17 **Energy system [b-ISO/IEC 13273-1]:** a system that consists of all the components related to production, conversion, delivery, and use of energy.

7.2.1.18 **Energy system models [b-ISO/IEC 13273-1]:** Conceptual tools that depict the structure and support the calculation of the technological performance and decision making for design, operation and control.

7.2.1.19 **Extended reality [b-2021-FG-AI4EE D.WG3-01]:** Combines all forms of real-virtual environments and human-machine interactions, including but not limited to augmented reality, mixed reality, and virtual reality.

7.2.1.20 **ICT energy efficiency [b-2021-FG-AI4EE D.WG2-03]:** The ratio of energy consumed by specific ICT systems to the output produced or service performed by these systems.

7.2.1.21 **Industry 4.0 [b-2021-FG-AI4EE D.WG3-01]:** An industrial approach where one or more digital technologies are used throughout industrial processes in order to produce more and better.

7.2.1.22 **Next Generation Networks [b-2021-FG-AI4EE D.WG1-06]:** Next-Generation Network (NGN) will be the dominant type of core network or telecommunication infrastructure for 5G and 6G networks. It is a packet switching network which is self-aware, self-managed, and self- configured.

7.2.1.23 **Power Usage Effectiveness (PUE) [b-ISO/IEC 30134-2]:** Ratio of the data centre's total energy consumption to information technology equipment energy consumption, calculated, measured or assessed across the same period.

7.2.1.24 **Public key cryptography [b-2021-FG-AI4EE D.WG2-05]:** Also called asymmetric key is a milestone in the development of modern cryptography, which mainly includes a public key and a private key.

7.2.1.25 **Smart contract [b-2021-FG-AI4EE D.WG2-05]:** A program written on a distributed ledger system, which encodes the rules for specific types of distributed ledger system transactions in a way that can be validated, and triggered by specific conditions; software program that it is executed automatically and capable of carrying out the terms of the agreement between parties without the need for human intervention; pieces of software that execute a specified action based on the state of the system or a transaction that occurs.

7.2.1.26 **Smart Sustainable Cities [b-ITU-T Y.4900]:** An innovative city that uses information and communications technologies and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.

7.2.1.27 **Stateless contract [b-2021-FG-AI4EE D.WG2-05]:** A contract with specified states.

7.2.1.28 **TIMES [b-2021-FG-AI4EE D.WG2-03]:** Energy efficiency model based on a linear programming.

7.2.1.29 **Token [b-2021-FG-AI4EE D.WG2-05]:** A digital representation of value on a shared distributed ledger that is owned and secured using cryptography to ensure its authenticity and prevent modification or tampering without the owner's consent.

7.2.1.30 **Vehicle Platooning [b-2021-FG-AI4EE D.WG1-06]:** In intelligent transportation, vehicle platooning is a method of vehicle to vehicle collaboration where a group of vehicles drive together in a group of 3 to 20 vehicles or trucks. Vehicles use artificial intelligence to collect, analyse, and share data for safety and vehicles can join and leave the platoon.

7.2.1.31 **Vehicle to vehicle collaboration (V2V) [b-2021-FG-AI4EE D.WG1-06]:** In ITS and smart roads, Vehicle to vehicle collaboration (V2V) are vehicles equipped with sensors,

cameras, algorithms, and other smart devices and exchange road conditions, speed, position, directions, hazards and threats with other vehicles.

7.2.1.32 **Vehicle-to-infrastructure** (V2I) **[b-2021-FG-AI4EE D.WG1-06]:** is a communication model in which vehicles use smart devices and algorithms to share and access information from traffic and road infrastructure. Used devices and infrastructure include traffic lights, RFID readers, cameras, sensors, lane markers, streetlights, signage and parking meters. Exchanged information include speed, position, road conditions, heading angle, and threats.

7.2.2 Industry standard terms

7.2.2.1 **Artificial Intelligence (AI) [b-ITU-T F.749.13]:** An interdisciplinary field, usually regarded as a branch of computer science, dealing with models and systems for the performance of functions generally associated with human intelligence, such as reasoning and learning.

7.2.2.2 **Augmented reality [b-ITU-T J.301]:** A type of mixed reality where graphical elements are integrated into the real world in order to enhance user experience and enrich information.

7.2.2.3 **Big data [b-ISO/IEC 20546]:** Extensive datasets – primarily in the data characteristics of volume, variety, velocity, and/or variability – that require a scalable technology for efficient storage, manipulation, management, and analysis.

7.2.2.4 **Bitcoin [b-ITU-T X.1400]:** An example of a blockchain using proof of work.

7.2.2.5 **Blockchain [b-ITU-T F.751]:** A type of distributed ledger that is composed of digitally recorded data arranged as a successively growing chain of blocks with each block cryptographically linked and hardened against tampering and revision.

7.2.2.6 **Cloud computing [b-Recommendation ITU-T Y.3500]:** Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.

7.2.2.7 **Data centre [b-Recommendation ITU-T X.1053]:** A facility used to house computer systems and associated components, such as telecommunication and storage systems.

7.2.2.8 **Deep learning [b-ISO/IEC TR 29119-11]:** Approach to creating rich hierarchical representations through the training of neural networks with one or more hidden layers.

7.2.2.9 **Digital twin [b-ISO/TR 24464]:** Compound model composed of a physical asset, an avatar, and an interface.

7.2.2.10 **Edge Computing [b-ISO/IEC TR30164]:** Distributed computing in which processing and storage takes place at or near the edge, where the nearness is defined by the system's requirements.

7.2.2.11 **Infrastructure-as-a-Service (IaaS) [b-IEEE Software Defined Networks]:** A platform supporting the resources needed by other layers. IaaS can be “programmed” by utilizing provisioning tools. Because of this programming interface, even if IaaS is often (but not only) made of “physical” resources, IaaS can be considered as a component.

7.2.2.12 **Internet of things [b-ITU-T Y.2060]:** A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.

7.2.2.13 **Machine Learning [b-ITU-T Y.3172]:** Processes that enable computational systems to understand data and gain knowledge from it without necessarily being explicitly programmed.

7.2.2.14 **Mixed reality [b-ISO/IEC 18038]:** Merging of real and virtual worlds to generate new environments where physical and synthetic objects co-exist and interact.

7.2.2.15 **NLP [b-ITU-T X.1080.2]:** A method that analyses text in natural languages through several processes such as part-of-speech recognition, syntactic analysis and semantic analysis.

7.2.2.16 **Platform-as-a-Service (PaaS) [b-IEEE Software Defined Networks]:** PaaS provides infrastructure, storage, database, information, and process as a service, along with well-defined APIs, and services for the management of the running applications, such as dashboards for monitoring and service composition.

7.2.2.17 **Quantum computing [b-ISO/TS 80004]:** Use of quantum phenomena for computational purposes.

7.2.2.18 **Smart Sustainable Cities [b-ITU-T Y.4900]:** is an innovative city that uses ICTs and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.

7.2.2.19 **Virtual reality [b-ISO 9241-394]:** Set of artificial conditions created by computer and dedicated electronic devices that simulate visual images and possibly other sensory information of a user’s surrounding with which the user is allowed to interact.

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[b-ISO/TR 24464]	ISO/TR 24464:2020 Automation systems and integration — Industrial data — Visualization elements of digital twins ISO - ISO/TR 24464:2020 - Automation systems and integration — Industrial data — Visualization elements of digital twins
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Information technology — Computer graphics, image processing and environmental representation — Sensor representation in mixed and augmented reality

ISO - ISO/IEC 18038:2020 - Information technology — Computer graphics, image processing and environmental representation — Sensor representation in mixed and augmented reality

[b-ITU-T X.1080.2] [712-PLEN] Draft text for Rec. ITU-T X.1080.2 (th2), Telebiometrics related to e-health - Part 2: Physics

[712-PLEN] Draft text for Rec. ITU-T X.1080.2 (th2), Telebiometrics related to e-health - Part 2: Physics

[b-ISO/TS 80004] ISO/TS 80004-1:2015

Nanotechnologies — Vocabulary — Part 1: Core terms

ISO - ISO/TS 80004-1:2015 - Nanotechnologies — Vocabulary — Part 1: Core terms

[b-ISO 9241-394] ISO 9241-394:2020

Ergonomics of human-system interaction — Part 394: Ergonomic requirements for reducing undesirable biomedical effects of visually induced motion sickness during watching electronic images

ISO - ISO 9241-394:2020 - Ergonomics of human-system interaction — Part 394: Ergonomic requirements for reducing undesirable biomedical effects of visually induced motion sickness during watching electronic images

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