Field: Artificial Intelligence (AI), Machine Learning (ML)

Status: 15 March 2022

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<td>Title w. ToR/mandate/LSG Subgroups/Questions</td>
<td>• ISO/IEC AWI TR 5469 “Artificial intelligence — Functional safety and AI systems”</td>
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<td>• ISO/IEC AWI TS 5471 “Artificial intelligence — Quality evaluation guidelines for AI systems”</td>
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<td>• ISO/IEC AWI TS 6254 “Information technology — Artificial intelligence — Objectives and approaches for explainability of ML models and AI systems”</td>
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<td>• ISO/IEC AWI TS 8200 “Information technology — Artificial intelligence — Controllability of automated artificial intelligence systems”</td>
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<td>• ISO/IEC FDIS 22989 “Information technology — Artificial intelligence — Artificial intelligence concepts and terminology”</td>
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<td>• ISO/IEC FDIS 23053 “Framework for Artificial Intelligence (AI)”</td>
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<td>ITU-T SG13</td>
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<td>management framework for Big data analytics”</td>
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<td>• ISO/IEC CD 25059 “Software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality model for AI-based systems”</td>
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<td>• ISO/IEC FDIS 38507 “Information technology — Governance of IT — Governance implications of the use of artificial intelligence by organizations”</td>
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<td>• ISO/IEC CD 42001 “Information Technology — Artificial intelligence — Management system”</td>
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<td>Future networks, with focus on IMT-2020, cloud computing and trusted network infrastructures</td>
<td>Work programme</td>
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<td>SG13 Counsellor: Tatiana Kurakova</td>
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<td>• Question 5/13 – Applying Future Networks and innovation in developing countries</td>
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<td>Prepare gap analysis on the current status and trends of IMT-2020, future networks, cloud computing, trust in ICT, big data, SDN, AI, ML and any other new technologies, from a viewpoint of developing country telecom networks. Develop requirements and use cases in terms of services and deployments for applying IMT-2020, future networks, NGN, cloud computing, Trust, big data, SDN, AI, ML and any other new technologies in Developing Country telecom networks.</td>
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<td>• Question 6/13 –</td>
<td>• Rec. ITU-T Y.3170 “Requirements for</td>
<td>• Y.QKDN-qos-ml-req “Requirements of machine</td>
<td>What new Recommendations or</td>
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- **Question 5/13 – Applying Future Networks and innovation in developing countries**
  - Prepare gap analysis on the current status and trends of IMT-2020, future networks, cloud computing, trust in ICT, big data, SDN, AI, ML and any other new technologies, from a viewpoint of developing country telecom networks. Develop requirements and use cases in terms of services and deployments for applying IMT-2020, future networks, NGN, cloud computing, Trust, big data, SDN, AI, ML and any other new technologies in Developing Country telecom networks.

- **Question 6/13 –**
  - **Rec. ITU-T Y.3170 “Requirements for**
  - **Y.QKDN-qos-ml-req “Requirements of machine**
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| **Networks beyond IMT2020: Quality of service (QoS) mechanisms** | machine learning-based quality of service assurance for the IMT-2020 network
| **Question 7/13 – Future Networks: Deep packet inspection and network intelligence** | • Y.3654 (ex Y.bDDN-MLMec) “Machine learning mechanism”
• Y.Mec-INS “Mechanism of intelligent network status awareness”
• Y.3180 (ex Y.MecTA-ML) “Mechanism of traffic awareness for application-descriptor-agnostic traffic based on machine learning”
• Y.3680 (ex Y.MLN-Fr) “Framework for man-like networking” | | | | What new Recommendations are needed to support functional requirements, functional architecture, mechanism and application scenarios of intelligent network-awareness in future networks from the perspective of emerging application context? |
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<th>Group (SG, TC, SC)</th>
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<td>Subgroups/Questions</td>
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<td>What new Recommendations are needed to provide framework, requirements and architecture for networking scenarios which use deep packet inspection and intelligent network-awareness in order to support capabilities like environment awareness, self-awareness, self-learning and thinking, self-decision, self-operation, self-restructuring, self-optimization and self-protection? What new Recommendations are needed for other application based on deep packet inspection and intelligent network-awareness?</td>
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<td><strong>Question 16/13 – Future Networks: Trustworthy and Quantum Enhanced Networking and Services</strong></td>
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<td><strong>Question 17/13 – Future Networks: Requirements and capabilities for computing including cloud computing and data handling</strong></td>
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<td><strong>Question 19/13 – Future</strong></td>
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<td><strong>Networks:</strong> End-to-end management, governance, and security for computing including cloud computing and data handling</td>
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memory-centric computing, quantum cloud computing and computing aware networking. Therefore, the telecommunication industry has an important role to play in the fields of future computing and furthermore, the integration and development of future computing technologies in Future Networks will drive a rapid move towards a digital transformation. The primary focus of this Question is to develop standards on end-to-end management, governance, and security for future
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<td>computing including cloud computing and data handling from the perspective of telecommunication. The novel methods based on artificial intelligence and machine learning are essential to handle complexity of future computing management and optimally orchestrate its operation and lifecycle management.</td>
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<td>• <a href="https://www.itu.int/rec/T-REC-Y.3174">Rec. ITU-T Y.3174</a> “Framework for data handling to enable”</td>
<td>• <a href="https://www.itu.int/rec/T-REC-Y.IMT2020-DJLML">Y.IMT2020-DJLML</a> “Requirements and framework for distributed joint learning to enable machine learning in”</td>
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<td>s and architecture</td>
<td>machine learning in future networks including IMT-2020”</td>
<td>future networks including IMT-2020”</td>
<td>beyond IMT-2020 including AI/ML based on the identified requirements and capabilities?</td>
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<td>Rec. ITU-T Y.3176 “Machine learning marketplace integration in future networks including IMT-2020”</td>
<td>Y.ML-IMT2020-MLFO “Requirements and architecture for machine learning function orchestrator”</td>
<td>What key technologies related to networks beyond IMT-2020 including AI/ML are required to realize the networks?</td>
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<td>Rec. ITU-T Y.3179 “Architectural</td>
<td>Y.ML-IMT2020-VNS “Framework for network slicing management enabled by machine learning including input from verticals”</td>
<td>How to build and/or guide the ecosystem on networks beyond IMT-2020?</td>
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<td>How to utilize and guide the open source software activities related to networks beyond IMT-2020 and AI/ML to meet</td>
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| **Title w. ToR/mandate/LSG**
| **Subgroups/Questions** | framework for ML model serving in future networks including IMT-2020”
- Y Suppl. 55 “ITU-T Y.3170-series – Machine learning in future networks including IMT-2020: use cases” | the requirements of the networks?
Development of Recommendations on the requirements and capabilities for networks beyond IMT-2020 including AI/ML based on the emerging service scenarios.
Development of Recommendations on the framework and architecture design of networks beyond IMT-2020 including AI/ML, based on, not limited to, the above identified requirements, capabilities and gap analysis identified by Focus Group on Machine Learning for Future Networks including 5G.
Development of Recommendations and other relevant documents | | |
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<td><strong>Question 22/13 – Networks beyond IMT2020: Emerging network technologies</strong></td>
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<td>What extensions are required in DAN/ICN and FPBN/PTDN to incorporate in-network computing, big data analysis, distributed ledger technology/blockchain, machine learning and artificial intelligence (ML/AI) for satisfying requirements of high throughput, low latency, low energy consumption, and high network efficiency? Development of Recommendations including scenarios, use cases, requirements, framework and functional architecture on the extension of DAN/ICN and FPBN/PTDN with the component technologies of in-network computing,</td>
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<td>big data analysis, DLT/blockchain, ML/AI.</td>
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<td>• <strong>Question 23/13</strong> – Networks beyond IMT2020: Fixed, mobile and satellite convergence</td>
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<td>Study the application of innovative network and IT technologies in fixed, mobile and satellite convergence in networks beyond IMT2020, such as land and satellite convergence, AI/ML, DLT, quantum information technologies, etc.</td>
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<td>ITU-T SG16 Multimedia coding, systems and applications</td>
<td>ITU-T SG16 Counsellor: Simao Campos</td>
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<td>• <strong>Question 5/16</strong> – Artificial intelligence-enabled multimedia applications</td>
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<td></td>
<td>• Rec. ITU-T F.748.11 “Metrics and evaluation methods for deep neural network processor benchmark”</td>
<td>• F.ADT4MM “Requirements and framework of AI-based detection technologies for 5G multimedia messages”</td>
<td>scope and definition of AI as it relates to multimedia applications; identify specific use cases where AI can be applied to multimedia applications;</td>
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<td><strong>Title w. ToR/mandate/LSG Subgroups/Questions</strong></td>
<td><strong>evaluation methodology</strong></td>
<td>- <strong>F.AI-CPP</strong> “Technical specification for artificial intelligence cloud platform: Model development”</td>
<td>identify AI techniques facilitating intelligent and automated multimedia-based tasks, such as video surveillance, content screening, image recognition etc.; data preparation for use with AI-enabled multimedia applications; specific system characteristics for AI-enabled multimedia applications; assessment and evaluation techniques for AI-enabled service platforms, such as intelligent speech, natural language processing, machine translation, deep-learning based face recognition and verification, etc.;</td>
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<td>• <strong>F.AI-MKGDS</strong> “Requirements for the construction of multimedia knowledge graph database structure based on artificial intelligence”</td>
<td>identification of how AI may impact existing multimedia applications; accessibility of AI enabled multimedia applications for all, to help persons with disabilities.</td>
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<td>• <strong>F.AI-MVSLWS (ex F.AI-VDSLWS)</strong> “Requirements for artificial intelligence based machine vision service in smart logistics warehouse system”</td>
<td>determine the scope and definitions of AI as it relates to multimedia applications; identify and collect specific use cases where AI can be applied to multimedia applications; identify data preparation requirements, including but not limited to data collection, data labelling, data control and data delivery; identify the requirements for evaluation and assessment methodologies for</td>
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<td>• <strong>F.AI-RMCDP</strong> “Requirements of multimedia composite data preprocessing”</td>
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<td>• <strong>F.AI-RPAS</strong> “Technical requirements and evaluation methods for a robotic process automation system”</td>
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<td>• <strong>F.AI-RSRSreqs</strong> “Requirements for real-time super-resolution service based on artificial intelligence”</td>
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<td>• <strong>F.AI-SCS</strong> “Use cases and requirements for speech interaction of intelligent customer service”</td>
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<td>quantifying the performance of AI-enabled multimedia applications; identify and collect use cases on accessibility of AI enabled multimedia applications; maintain deliverables under the responsibility of the Question, including: ITU-T F.748.11.</td>
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- **F.AI-SE** “Requirements for smart factory based on artificial intelligence”
- **F.FML-TS-FR** “Requirement and framework of trustworthy federated machine learning based service”
- **F.ML-ICSMIReqs** “Requirements and framework for intelligent crowd sensing multimedia interaction based on deep learning”
- **F.TCEF-FML** “Trusted contribution evaluation framework on federated machine learning services”
- **F.IMCS** “Requirements for smart speaker based intelligent multimedia communication system”
- **F.REAIOCR** “Requirements and evaluation methods for AI-based optical character recognition service”
- **F.SCAI** “Requirements for smart class based on artificial intelligence”
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<td><strong>F.AI-VDSTLS</strong> “Requirements for artificial intelligence based vision detection service in smart logistics warehouse system”</td>
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<td><strong>Question 13/16 – Content delivery, multimedia application platforms and end systems for IP-based television services including digital signage</strong></td>
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<td><strong>F.CDN-AIW</strong> “Requirements and reference model for CDN services over AI network”</td>
<td>consideration of new emerging technologies such as artificial intelligence, natural language translation, motion recognition, immersive experiences, UHD including 4K/8K, VR/AR/MR/XR and IMT-2020/5G for providing enhanced digital signage and IP-based television services;</td>
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<td><strong>Question 21/16 – Multimedia framework, applications and services</strong></td>
<td><strong>Rec. ITU-T F.746.11 “Interfaces for intelligent question answering system”</strong></td>
<td><strong>Rec. ITU-T F.749.13 “Framework and requirements for civilian unmanned</strong></td>
<td>study CUAV-related multimedia application and services (such as power line and petroleum pipeline inspection, disaster monitoring, environmental quality monitoring and</td>
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<td>(\text{Title w. ToR/mandate/LSG Subgroups/Questions})</td>
<td>aerial vehicle flight control using artificial intelligence</td>
<td>forecasting analysis, aerial photography and video, express delivery, forestry and forest fire monitoring, and crop monitoring, etc.) as well as CUAV task executing, cooperation, video/audio data transmission optimization, flight electronic fence along with artificial-intelligence controlling, multimedia display and virtual reality presentation;</td>
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<td>• Question 24/16 – Human factors for intelligent user interfaces and services</td>
<td>Rec. ITU-T H.862.5 “Emotion enabled multimodal user interface based on artificial neural networks”</td>
<td>F.AITRL-Fr “Framework for AI technology readiness level for human factors”</td>
<td>analysis of human factors for the new technologies, such as human-assisting devices, artificial intelligence-enabled devices/services and IoT services;</td>
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<td>• Question 26/16 – Accessibility to</td>
<td>F.STP-ACC-AI “Guideline on the use of AI for ICT accessibility”</td>
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<td>multimedia systems and services</td>
<td>• Rec. ITU-T F.749.4 “Use cases and requirements for multimedia communication enabled vehicle systems using artificial intelligence”</td>
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<td>studies on road safety, autonomous and assisted driving and the performance evaluation of the artificial intelligence system responsible for the driving tasks;</td>
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<td>• Question 27/16 – Vehicular multimedia communications, systems, networks, and applications</td>
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<td>impact of new areas of study such as artificial intelligence, bioinformatics (genomics in particular), health software, pharmacovigilance, gamification, and virtual reality (XR) in standards for digital health;</td>
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## Part II – Other groups

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<tr>
<td>IEC/SEG 10</td>
<td>Ethics in Autonomous and Artificial Intelligence Applications</td>
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<td>Of interest to SG16?</td>
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<td>ITU-T SG2 Operational aspects of service provision and telecommunication management</td>
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<td>• <strong>Question 5/2 – Requirements, priorities and planning for telecommunication/ICT management and operation, administration and maintenance (OAM) Recommendations</strong></td>
<td>Rec. ITU-T M.3381 “Requirements for energy saving management of 5G radio access network (RAN) systems with artificial intelligence (AI)”</td>
<td><strong>M.rfmls</strong> “Management Requirements for Federated Machine Learning Systems”</td>
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<td><strong>M.ria-AI</strong> “Requirements for Log Analysis with AI-enhanced Management System”</td>
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<td><strong>M.rnoc-AI</strong> “Requirements for the management of network operation cost within AITOM in telecom operational aspects”</td>
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<td><strong>M.rwop-AI</strong> “Requirements for work orders processing in Telecom management with AI”</td>
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<td>• <strong>Question 6/2 – Management architecture and security</strong></td>
<td>Rec. ITU-T M.3080 “Framework of AI enhanced Telecom Operation and Management (AITOM)”</td>
<td><strong>M.il-AITOM</strong> “Intelligence Levels of AI enhanced Telecom Operation and Management”</td>
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<td>How to use future technologies (e.g., using cloud, smart maintenance and AI/ML) to improve the management system architectures? Develop AI/ML enhanced management architectures, which support new services, such as auto-driving.</td>
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<td>• <strong>Question 7/2 – Interface specifications and specification methodology</strong></td>
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<td>What enhancements to the information model definition are required if</td>
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<tr>
<td>ITU-T SG5 Environment, climate change and circular economy</td>
<td>Work programme</td>
<td>AI/ML is applied in network management.</td>
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</table>

- **Question 6/5 – Environmental efficiency of digital technologies**
  - ITU-T L Suppl. 43 “Smart energy saving of 5G base stations: Traffic forecasting and strategy optimization of 5G wireless network energy consumption”

Identify environmentally efficient technologies and solutions for ICT and digital technologies (including 5G/IMT-2020, big data, artificial intelligence, blockchain, etc.,) and other industries;
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<td>based on artificial intelligence and other emerging technologies”</td>
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<td>• <strong>Question 9/5 – Climate change and assessment of digital technologies in the framework of the Sustainable Development Goals (SDGs) and the Paris Agreement</strong></td>
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<td>• <strong>Question 10/5 – Climate change mitigation and smart energy solutions</strong></td>
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<td>• <strong>Rec. ITU-T L.1305 “Data centre infrastructure management system based on big data and artificial intelligence technology”</strong></td>
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<td>ITU-T SG9</td>
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<td>Television and sound transmission and integrated broadband cable networks</td>
<td>• <strong>Question 6/9</strong> – Functional requirements for terminal devices of the integrated broadband cable network</td>
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<td>What requirements are needed to present services (including HDR, 4K and 8K UHDTV, VR/AR, multi-screen) making use of new technologies (e.g. AI, IoT etc.) to consumers in terminal devices of the integrated broadband cable network?</td>
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<td>• <strong>Question 8/9</strong> – The Internet protocol (IP) enabled multimedia applications and services for cable television networks enabled by converged platforms</td>
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<td>What are the technologies necessary for the provisioning multimedia interactive services, including primary cable services, third party services (e.g., over the top service), multi-screen service, cloud computing services, big data services and AI services?</td>
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<td>• <strong>Question 12/9</strong> – AI-enabled enhanced functions over integrated broadband cable network</td>
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<td>What kinds of intelligent functions are applied for video and data transmission over the integrated broadband network?</td>
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<td>What are the requirements and benefits about the use of intelligent functions for the video and data transmission? Where and how intelligent functions are logically deployed within the integrated broadband network? What and how interfaces and data models can be used for harmonizing the intelligent functions of video and data transmission, also to ensure compatibility with the traditional functions over the integrated broadband network? What are the physical and logical entities that enable intelligent functions over the entire video and data transmission network for the use and configuration of the service provider or customers or both?</td>
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<td>Taking advantage of the intelligent functions for video and data transmission optimization over the network, what methods can be utilized to enhance the video experience for the final customer?</td>
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<td>ITU-T SG11 Signalling requirements, protocols, test specifications and combating counterfeit products</td>
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<td>Work programme</td>
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<tr>
<td>• Question 1/11 – Signalling and protocol architectures for telecommunication networks and guidelines for implementations</td>
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<td>What enhancements to the signalling and control architecture are required to model the control plane for telecommunication networks with emerging technologies such as ML/AI, Distributed Ledger Technology, QKDN and related technologies and the technologies applied in IMT-2020 network and beyond, taking into account new services and new applications and all types of</td>
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<td>wireline and wireless public access networks over which these services may be delivered? study the signalling and control architecture to model the control plane for telecommunication networks with emerging technologies such as ML/AI, Distributed Ledger Technology, QKDN and related technologies and the technologies applied in IMT-2020 network and beyond;</td>
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- **Question 4/11 – Protocols for control, management and orchestration of network resources**
  - What data models, signalling requirements and protocols are required for big data and AI/ML driven networking?

- **Question 5/11 – Signalling requirements and**
  - **Q.BNG-INC “Requirements and signalling of intelligence control for the border network**
  - What new protocols and procedures need to be specified to enable rapid
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<th>Group (SG, TC, SC) Title w. ToR/mandate/LSG Subgroups/Questions</th>
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<tr>
<td>protocols for border network gateway in the context of network virtualization and intelligentization</td>
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<td>gateway in computing power network”</td>
<td>provisioning of services over customer IP networks adopting emerging technologies (e.g. SDN/NFV, cloud computing, IoT, AI, MEC, etc.)? What new protocols and procedures need to be specified to enable the AI-assisted network management and resource orchestration among multiple border network gateways? What new data model, protocol and interaction process to be specified to enable the AI decision entities acquiring the real-time status data from border network gateways? Develop new requirements, protocols and functions for border network gateway to support emerging technologies (e.g. SDN/NFV, cloud computing, IoT, AI, MEC, etc.);</td>
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<td>develop new protocol and procedures to enable the AI-assisted network management and resource orchestration among multiple border network gateways.</td>
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- **Question 6/11 – Protocols supporting control and management technologies for IMT-2020 network and beyond**
  - **Q.5024 (ex Q.IMT2020-PIAS)** “Protocol for providing intelligent analysis services in IMT-2020 network”
  - How emerging technologies including AI, big data, and QKDN and related technologies are leveraged in the control and management protocols for IMT-2020 network and beyond? Develop Recommendations on protocols, including mechanisms, to support IMT-2020 network and beyond by using technologies such as network slicing, resource virtualization, orchestration, AI and big data, QKDN and related technologies, etc.;

- **Question 7/11 – Signalling requirements and protocols for network**
  - **Q.AIS-SRA** “Signalling requirements and architecture to support AI based vertical
  - What new Recommendations are required to specify signalling requirements and
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<td>attachment and edge computing for future networks, IMT-2020 network and beyond</td>
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<td>services in future network, IMT2020 and beyond”</td>
<td>protocols to support attachment and edge computing services (AI, Bigdata, mobility, edge cloud, etc.) for multi-device/interface/connection services?</td>
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<td>• Question 13/11 – Monitoring parameters for protocols used in emerging networks, including cloud/edge computing and software-defined networking/network function virtualization (SDN/NFV)</td>
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<td>ITU-T SG12 Performance, quality of service and quality of experience</td>
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<td>• Question 9/12 – Perceptual-based objective methods and corresponding evaluation guidelines for voice and audio quality measurements</td>
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<td>• P.MLGuide “Guide for Development of Machine Learning Based Solutions”</td>
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<td>This Question analyses and recommends methods, metrics and procedures for statistical evaluation, qualification and comparison of objective quality prediction models.</td>
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<td>These statistics can be applied to objective prediction models which can be translated to an estimated subjective judgment of a dedicated subjective test procedure. This Question discusses frameworks, metrics and example procedures for those statistical analyses and reporting. Furthermore, this question gives guidance to develop quality prediction models in general and specifically by means of machine learning and artificial intelligence as in P.MLGuide. guidance for using machine learning techniques in prediction model development.</td>
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<td><strong>in telecommunication services</strong></td>
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<td><strong>Question 12/12 - Operational aspects of telecommunication network service quality</strong></td>
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<td><strong>E.AIQ</strong> “Artificial Intelligence Quotient (AI-Q) for indexing and rating AI algorithms used in conversational AI systems employed for customer service management, service</td>
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<td>“optimization and management as part of service quality assessment methodologies”</td>
<td>How can video- and audiovisual quality prediction best benefit from different machine-learning approaches?</td>
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<td><strong>Question 14/12 – Development of models and tools for multimedia quality assessment of packet-based video services</strong></td>
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<td><strong>Question 15/12 – Parametric and E-model-based planning, prediction and monitoring of conversational speech and audio-visual quality</strong></td>
<td><strong>Rec. ITU-T P.565</strong> “Framework for creation and performance testing of machine learning based models for the assessment of transmission network impact on speech quality for mobile packet-switched voice services”</td>
<td><strong>P.565</strong> “Framework for creation and performance testing of machine learning based models for the assessment of transmission network impact on speech quality for mobile packet-switched voice services”</td>
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<td>• Rec. ITU-T P.565.1 “Machine learning model for the assessment of transmission network impact on speech quality for mobile packet-switched voice services”</td>
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<td>• <strong>Question 16/12</strong> – Intelligent diagnostic functions framework for networks and services</td>
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<td>determine the characteristics of an objective measurement or anomaly detection that would help identify the root cause of the impairment using an algorithm or an analytic tool such as data mining and machine learning;</td>
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<td>• <strong>Question 19/12</strong> – Objective and subjective methods for evaluating perceptual audiovisual quality in</td>
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<td>Impairment characterizations: Among the most significant factors (e.g. spatial resolution, temporal resolution, colour</td>
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<td>fidelity, audio and visual artefacts, media synchronization, delay, cross-talk etc.) affecting the overall quality of multimedia services, what objective and subjective methods assess the extent of or can differentiate between these factors? How can the mutual interaction between these factors be objectively and subjectively measured with respect to their influence on overall audiovisual quality? For what applications can the assessment methods be shown to be useful and robust over a range of conditions? What kind of artificial impairment generator would be useful for subjective or objective methods?</td>
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<td>multimedia and television services</td>
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**ITU-T SG15**

- **Question 12/15 - Transport network architectures**

<p>| ITU-T SG15 | Work programme | Specify requirements for enhanced control interfaces to and within the transport | | | |</p>
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<th>Group (SG, TC, SC) Title w. ToR/mandate/LSG Subgroups/Questions</th>
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<td>network. Interfaces to configure and control programmable hardware are needed. Consider impacts of AI and ML on those interfaces. For example, are new parameters to existing interfaces required to support AI/ML applications; are new interfaces required to support them? What, if anything, needs to be changed architecturally to allow AI/ML applications to be used in the operation of the transport network? The architectural implications, if any, of providing support for the use of AI/ML technology for operational enhancements to the transport network, excluding AI/ML algorithm development. Use of AI and ML in the transport network.</td>
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<td>• <strong>Question 13/15 – Network synchronization and time distribution performance</strong></td>
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<td>Use of AI and ML in synchronization networks?</td>
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<td>• <strong>Question 14/15 – Management and control of transport systems and equipment</strong></td>
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<td>What requirements, information models, and data models must be specified to enable the use of AI/ML techniques applied to the management and control of the transport network? Management of AI/ML techniques as applied to a transport network.</td>
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<td>• <strong>Question 2/17 – Security architecture and network security</strong></td>
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<td>What are the foundations of artificial intelligence / machine learning (AI/ML) in supporting the building of confidence and security in the use of ICT?</td>
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<td>X.Sup-cs-ml (ex TR.cs-ML) “Supplement to X.1231: Countering spam based on machine learning”</td>
<td>How can artificial intelligence and machine learning be used to quickly identify and analyse new threats and vulnerabilities? How can AL/ML communication form of spam be identified and prevented? How to protect personal information with the adoption of AI/ML technology to avoid spam message spread? Specify how to use artificial intelligence and machine learning, to quickly identify and analyse new threats and vulnerabilities. Develop a set of solutions or new Recommendations for counting AI/ML communication form spams. Artificial intelligence and machine learning are being applied more broadly across industries and applications</td>
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**Question 4/17 – Cybersecurity and countering spam**
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than ever before. Technical means enabled by artificial intelligence and machine learning should improve the quality and efficiency of the technical activities against threats and attacks.

Managed security services (MSS) are services that have been outsourced to a service provider. There are two aspects of managed security services: technical, managerial.

With the rapid expansion of mobile internet and the convergence of ICT technologies, spam threats become more challenging with new features. The main ingredients of spam have significantly evolved from traditional advertisements and fraud to convergent malicious software such as ransom and targeted attacks. The new generation of spam is also unsolicited and...
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<td>harasses ICT service consumers, but they do even more serious damage than traditional ones. A targeted attack often uses spear phishing, a type of social engineering, to gain access to networks through legitimate means such as email. Ransomware is a type of malicious software that threatens to publish the victim's data or perpetually block access to it unless a ransom is paid. Some malwares, especially most ransomwares, can be spread through malicious email attachments and compromised websites. With the evolution of artificial intelligence / machine learning (AI/ML) technology, some communications can be initiated by machines but not humans, such as robocalls, robot chat, automatic text messages</td>
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<td>and so on. AI/ML algorithms can also make use of personal information more accurately to find target recipients to make large-scale commercial marketing spam or even fraud spam. How can artificial intelligence and machine learning be used to quickly identify and analyse new threats and vulnerabilities? Specify how to use artificial intelligence and machine learning, to quickly identify and analyse new threats and vulnerabilities. How to protect personal information with the adoption of AI/ML technology to avoid spam message spread? Develop a set of solutions or new Recommendations for counting AI/ML communication form spams.</td>
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<td>How to define a strategy for protecting Artificial Intelligence attack surface? Study and develop strategies and Recommendations for protecting Artificial Intelligence attack surface.</td>
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<td><strong>Question 7/17 – Secure application services</strong></td>
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**ITU-T SG20 Internet of things (IoT) and smart cities and communities (SC&C)**

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| | sustainable cities” | learning for intelligent IoT services”
  • Y.RA-FML “Requirements and reference architecture of IoT and smart city & community service based on federated machine learning” | | | |
| • **Question 4/20 - Data analytics, sharing, processing and management, including big data aspects, of IoT and SC&C** | | | the role of emerging technologies (e.g., blockchain, artificial intelligence and digital twin, etc.) to support DPM;
DPM, data analytics and sharing with support of emerging technologies (e.g., blockchain, artificial intelligence and digital twin, etc.) in IoT and SC&C; | | | |
<p>| • <strong>Question 5/20 – Study of emerging digital technologies, terminology and definitions</strong> | • ITU-T Y Suppl. 63 “Unlocking Internet of things with artificial intelligence” | | | | |
| • <strong>Question 6/20 - Security, privacy, trust, and identification for IoT and SC&amp;C</strong> | | | How to use machine learning and artificial intelligence (AI) technologies for supporting | |</p>
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<td>secured interoperability and trustworthiness in IoT &amp; SC&amp;C? machine learning and artificial intelligence (AI) technologies for supporting secured interoperability and trustworthiness in IoT &amp; SC&amp;C;</td>
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**ITU-T Focus Group on AI for Natural Disaster Management (FG-AI4NDM) ToR**

- Deliverable on “Data for AI”
- Deliverable on “AI for Modeling”

Constructing a roadmap for AI activities (in the context of data, modelling, and communication technologies) in natural disaster management. 2. Establishing a roster of stakeholders and experts and making a concerted effort to engage them in focus group activities. 3. Holding workshops that bring together stakeholders and experts, highlight ground-breaking activities in the area of AI (in the context of data, modelling, and communication technologies) for natural disaster management, and
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<td>facilitate recruitment of new focus group members. In addition, evaluating proposals of new use cases. 4. Working towards drafting non-normative deliverables (e.g., technical reports) on the use of AI to support data, modelling (reconstructing, forecasting, and projecting), and effective communication of natural disasters, based on input from the use cases. 5. Working towards development of educational materials (e.g., online courses and pamphlets) in conjunction with WMO (and other partners), which make the content of (4) accessible to all stakeholders and experts, in particular, those in SIDS and LDC. 6. Creating a comprehensive report, once FG-AI4NDM has achieved the aforementioned tasks, which summarizes these</td>
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| ITU-T Focus Group on Autonomous Networks (FG-AN) ToR | FG-AI4H Whitepaper  
- **J-102**: Updated call for proposals: use cases, benchmarking, and data  
- **F-103**: Updated FG-AI4H data acceptance and handling policy  
- **C-104**: Thematic classification scheme  
- **F-105**: ToRs for the WG-Experts and call for experts  
- **Application form; Conflict of interest form**  
- **F-106**: Guidelines on FG-AI4H online collaboration tools  
- **J-107**: Onboarding FG-AI4H document  
- **J-200-R1**: Updated list of FG-AI4H deliverables | | | | | To be a platform to facilitate a global dialogue for AI for health. 2. To collaborate with WHO in developing appropriate national guidance documents for establishing policy-enabled environment to ensure the safe and appropriate use of AI in health. 3. To identify standardization opportunities for a benchmarking framework that will enable broad use of AI for health. 4. To create a technical framework and standardization approach of AI for health algorithm assessment and validation. 5. To develop open benchmarks, targeted to... |
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<td><strong>AHG-DT4HE Output 1</strong>: Guidance on digital technologies for COVID health emergency&lt;sup&gt;new&lt;/sup&gt;</td>
<td>become international standards, and serve as guidance for the assessment of new AI for health algorithms. 6. To develop, together with WHO, an assessment framework for an evaluation and validation process of AI for health. 7. To collaborate with stakeholders to monitor and collect feedback from the use of AI algorithms in healthcare delivery environment, and to provide feedback to development of improved international standards. 8. To generate a transparent documentation by creating reports and specifications towards enabling external assessment of the benchmarking framework and the benchmarked AI for health methods. To develop a list of standards bodies, forums,</td>
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<td>consortia, regulators, core research organizations, engineering teams, health professionals, entrepreneurs, digital health policy makers and other entities dealing with aspects of AI and to establish liaisons and relationships with some of the listed organizations. • To organise thematic workshops and forums on AI for health, which will bring together all stakeholders, and promote the FG activities and encourage both ITU members and non-ITU members to join its work. • To gather information on initiatives pertaining to AI for health and to identify existing standards, AI methods, best practises and challenges for the adoption. To review existing technologies, platforms, guidelines, standards and</td>
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• To identify various use case descriptions of AI for health-based methods including the problem description. To identify potential health problems to which AI-relevant interventions and machine learning can be applied and assessed that are scalable.  
• To identify structured and normalized medical data required for testing AI algorithms that are part of emerging medical devices and diagnostics and to collect health data for the identified use cases.  
• To identify interfaces, criteria and to specify the framework for assessment and validation of AI-based solutions for the identified use cases.  
• To provide use case-specific benchmarking (results) of AI candidate algorithms and to generate reports.  
• To draft technical | | | | |
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<td>reports and specifications for assessment frameworks for AI for health, including for example data formats, interfaces, architecture, and protocols. Note, it is not intended to specify the AI for health algorithms themselves as an ITU Recommendation. • To write a report(s) of the FG activities including a recommendation how to proceed with AI for health standardization after the FG finished its work.</td>
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<td>ITU-T Focus Group on AI for autonomous and assisted driving (FG-AI4AD) ToR</td>
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<td>• TR01: “Automated driving safety data protocol – Specification” (<a href="#">FGAI4AD-I-100</a>) first draft</td>
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<td>• TR02: &quot;Automated driving safety data protocol – Public safety benefits of continual monitoring” (<a href="#">FGAI4AD-I-088</a>) latest draft</td>
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<td>• TR03: &quot;Automated driving safety data protocol – Practical</td>
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<td>To develop the specification for evaluation of AI on our roads that defines a minimum performance threshold and establishes a definition for the burden of proof; b) To provide information about the evaluation of AI on our roads to increase global public acceptance. c) To develop guidelines for the deployment of the</td>
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<td>evaluation of AI on our roads within private vehicles, commercial fleet operators, public transport operators, mobility-as-service operators and emergency response vehicles. d) To develop a list of SDOs, forums, consortia and other entities, including opensource, dealing with services and applications aspects of AI for autonomous and assisted driving and liaise with the organizations that could contribute to the related ITU standardization activities. e) To gather information on initiatives pertaining to AI on our roads, identify existing standards, best practices and challenges for adoption of autonomous and assisted driving. f) To analyse the standardization gaps related AI on our roads and develop a future standardization</td>
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<td>roadmap for evaluation, taking into consideration the activities currently undertaken by other ITU groups, various standards developing organizations (SDOs) and forums; g) To describe the roles and activities of the different stakeholders required to realise the potential of AI on our roads within the safe system approach. h) To provide terminology and taxonomy for evaluation of AI used for autonomous and assisted driving, including a mapping that aims to harmonise the language used in existing standards, legal frameworks and guidelines. i) To define specifically the terms ‘careless’, ‘dangerous’, ‘reckless’, ‘aware’, ‘willing’, ‘able’, ‘competent’, ‘careful’, and similar, in the legal context of autonomous and assisted</td>
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<td>driving in such a manner that they can be implemented and interpreted in software while being understood by humans. j) To develop a roadmap for the global deployment of evaluation of AI on our roads with the Vision Zero goal of eliminating of all deaths and serious injuries by 2050 while aligning with the United Nations 2030 Agenda for Sustainable Development. The roadmap must consider the cost and impact of deploying evaluation of AI on our roads. This should be considered within the context of holistic national investment in the Safe System approach to road safety. k) To draft technical reports which may include architectures, interfaces, protocols and data formats required to validate the</td>
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  l) To identify the technical landscape, a technical standards investigation orientation and standards investigation plan related to AI within assisted and autonomous driving systems.  
  m) To develop technical reports on the application of enabling technologies in evaluation of AI within assisted and autonomous driving systems. These technical reports describe the information the AI could provide to the validation system for the purposes of performance evaluation.  
  n) To develop guidelines which address privacy and proprietary challenges that | | |
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- may prevent/restrict access to data captured by the AI required for continual assessment of AI Driver performance. Including reference to the work of ITU-T SG17 on security and protection of personal information for vehicular multimedia and public adoption of Black Box (Telematics) insurance.
- To organise thematic workshops and forums covering AI on our roads that bring together all stakeholders, promotes the activities and encourages both ITU members and non-ITU members to join its work. NOTE – The needs of persons with disabilities and specific needs will be taken into account in undertaking the tasks above and preparation of deliverables. It is expected that using AI and drive-by-wire controls will enable new forms of
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<th>Tasks, Question, study items/study points</th>
<th>Liaison to</th>
<th>Remarks, observations</th>
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| ITU-T Focus Group on “Environmental Efficiency for Artificial Intelligence and other Emerging Technologies” (FG-AI4EE) ToR |  | • **List of WG1 Deliverables**  
• **List of WG2 Deliverables**  
• **List of WG3 Deliverables** | adapted driving that will increase driving safety for persons with disabilities and increasing human autonomy as a mobility solution | | |

- To gather information on existing initiatives and standards regarding the environmental performance of AI and other emerging technologies.
- To draft technical reports and technical specifications that highlight the environmental performance of AI and other emerging technologies.
- To identify uses cases and best practices on implementing AI and other emerging technologies in an environmentally sound manner.
- To develop strategies/toolkits that will minimize the environmental footprint of emerging technologies while...
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<th>Group (SG, TC, SC)</th>
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<td>Title w. ToR/mandate/LSG</td>
<td>Subgroups/ Questions</td>
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<td>maximizing energy efficiency and unlock the potential of a circular economy for stakeholders. To draft technical reports and specifications for establishing a standardized framework for assessing the environmental aspects of deploying AI and other emerging technologies (e.g. a set of key performance indicators). To study the benefits brought by AI and other emerging technologies to achieve, inter alia, the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals objectives, the UNFCCC Paris Agreement and the protection of biodiversity. To liaise with relevant stakeholders such as the WEF and UNFCCC among others on how to improve environmental performance</td>
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<td>of AI and other emerging technologies as well as with UNECE-UN/CEFACT for semantic harmonization of data requirements. To organise thematic workshops and forums on environmental efficiency for AI and other emerging technologies, in order to bring together relevant stakeholders, promote the FG activities, and encourage both ITU members and non-ITU members to participate in its work. Send the final deliverables to the parent group, at least four calendar weeks before the parent group meeting.</td>
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<td>AI for Good Global Summit</td>
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<td>Global Initiative on AI and Data Commons</td>
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