10th Anniversary

GISC 2026

Global ICT Standards Conference 2026

Session Title

Overview of ITU-T FG-EAI (Focus Group – Embodied Artificial Intelligence)

Stefano Polidori
Counsellor, ITU

ICT Standards and Intellectual Property:
Shaping the Physical AI

주최 과학기술정보통신부 지식재산처 주관 국립전파연구원 TTA IITP KEA kista ETRI

Outline

01 International Telecommunication Union (ITU)

02 AI for Good Global Summit

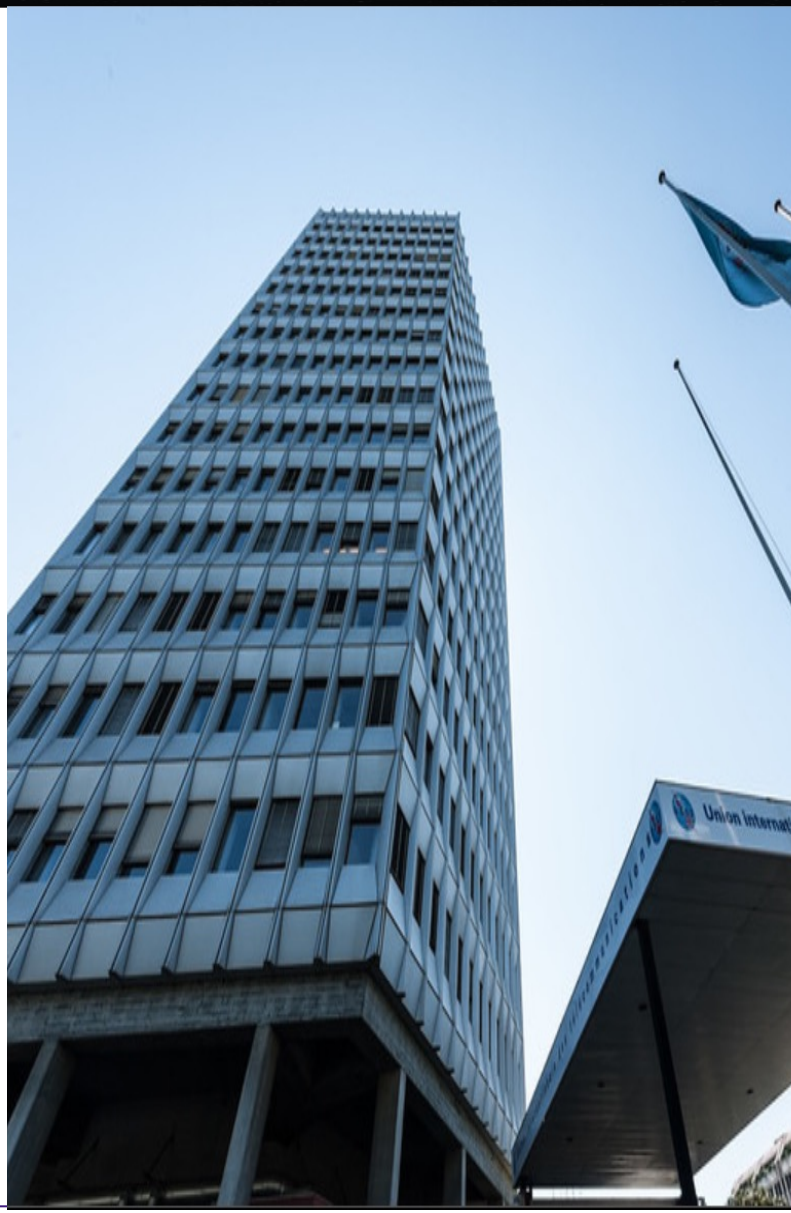
03 Focus Group - Embodied AI for Multimedia Technologies (FG-EAI)

International Telecommunication Union

- United Nations specialized agency for digital technologies
- Headquartered in Geneva, Switzerland
- Works towards harnessing innovation and connecting everyone to ensure a better future for all

Oldest agency in the UN family

- Established in 1865
- Connecting the world since the dawn of the telegraph



ITU regional presence

Regional offices

- Brasilia
- Addis Ababa
- Cairo
- Geneva
- Moscow
- Bangkok

Area offices

- Tegucigalpa
- Santiago
- Bridgetown
- Dakar
- Yaounde
- Harare
- Jakarta

UN office

- New York

Innovation Office

- Delhi



ITU Members



194

Member states



1000+

Companies, universities and international and regional organizations

Our work spans three areas, or *Sectors*:



Radiocommunication



Standardization



Development

Standardization

1956-2026 ITU-T Telecommunication Standardization Sector

- The public/private membership of ITU's Telecommunication Standardization Sector (ITU-T) develops **consensus based international technical standards** for the interconnection and interoperability of digital technologies
- ITU-T works to **bridge the standardization gap** between developed and developing countries
- ITU-T fosters **cooperation** among national, regional and international standards bodies



ITU-T Study Groups structure

10 STUDY GROUPS
4 FOCUS GROUPS

SG2 Operational aspects

SG3 Economic & policy issues

SG5 Environment, EMF, climate action & circular economy

SG11 Protocols, testing & combating counterfeiting

SG12 Performance, Quality of Service & Quality of Experience

SG13 Future networks

FOCUS GROUP Artificial Intelligence Native for Telecommunication Networks

SG15 Transport, access & home

SG17 Security

FOCUS GROUP Trust and Identity for Humans and Agentic AI

SG20 IoT, digital twins & smart cities

FOCUS GROUP AI for Smart Sustainable Cities and Communities

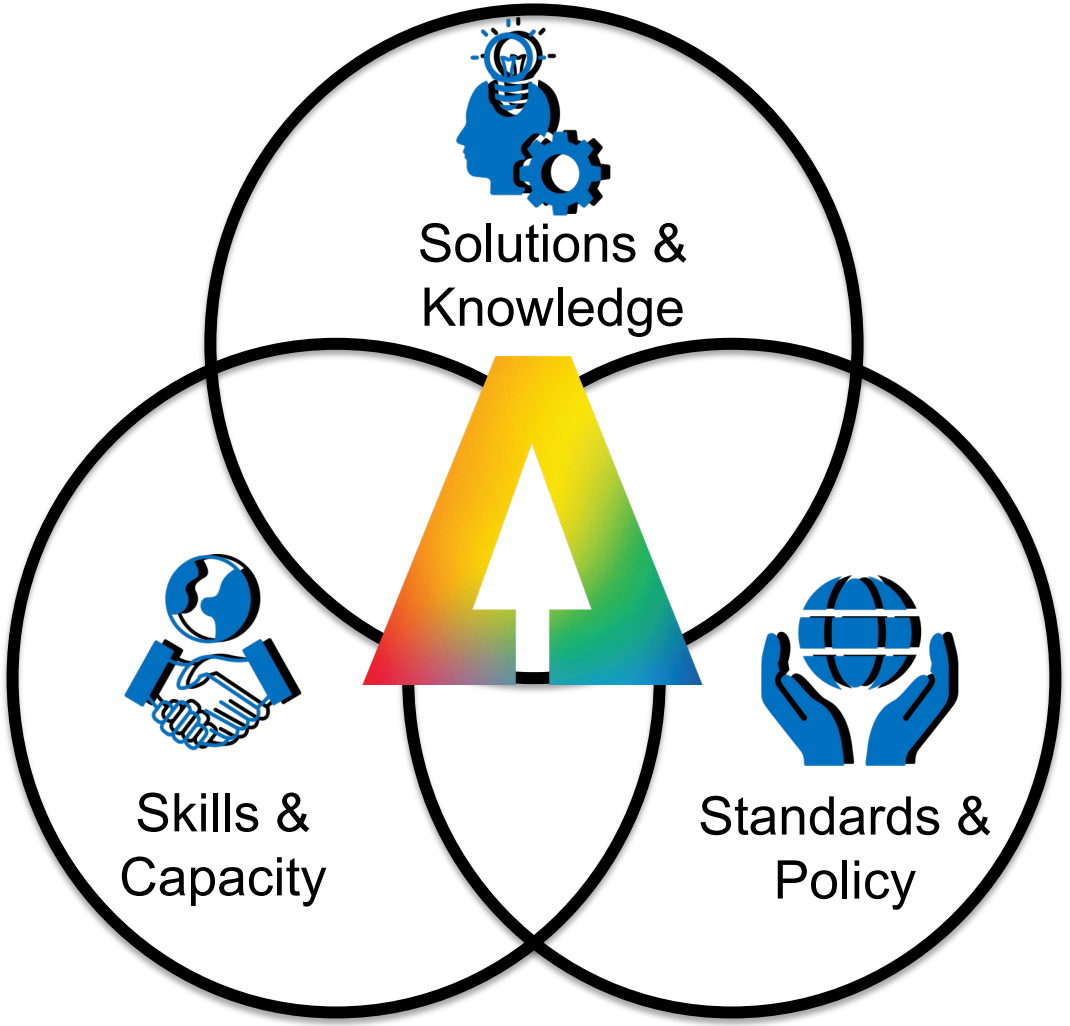
SG21 Multimedia, content delivery & cable TV

FOCUS GROUP Embodied AI for Multimedia Technologies

AI for Good Global Summit

The United Nations' leading platform on Artificial Intelligence

50+ UN PARTNERS



2026 Summit in Numbers

50+ UN PARTNERS

12’000+
Participants overall

1200+
Speakers

177+
Countries

43%
Women

53
UN Partners

76% / 24%
Participants from developed / developing countries

250
Exhibitors

380
Workshops / Sessions

150+
Accredited media

Summit Themes Global Summit 2026

50+ UN PARTNERS



AI & THE FUTURE OF WORK



AI CREATIVITY & CULTURE



AI FOR FOOD & AGRICULTURE



AI FOR HEALTH



AI SKILLS & EDUCATION



INTERNATIONAL AI STANDARDS



FRONTIER TECHNOLOGIES



AI & MOBILITY



IMPACT & INNOVATION



AI POLICY



QUANTUM FOR GOOD



ROBOTICS FOR GOOD



AI INFRASTRUCTURE



AI FOR PLANET

Current and past AI focus groups

50+ UN PARTNERS

Current

- Embodied Artificial Intelligence for Multimedia Technologies (FG-EAI)
- Trust and Identity for Humans and Agentic AI (FG-TIDA)
- AI for Smart Sustainable Cities and Communities (FG-AI4SSC)
- Artificial Intelligence Native for Telecommunication Networks (FG-AINN)

Concluded

- Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture (FG-AI4A)
- AI for Natural Disaster Management (FG-AI4NDM)
- Artificial Intelligence for Health (FG-AI4H)
- Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (FG-AI4EE)
- AI for autonomous and assisted driving (FG-AI4AD)

Workshop @AI4Good (07/2026) :
Embodied AI for multimedia technologies: From perception to human collaboration

50+ UN PARTNERS

VERY HIGH-LEVEL OPENING

Minister of MIIT, China
TSB Director, ITU



Transformative paradigm in which AI is integrated into physical bodies

Agreement: Standardization is essential to advance embodied AI



LAUNCHING CEREMONY

NEW FOCUS GROUP on EAI

https://www.itu.int/go/fgeai

ITU-T Focus Group - Embodied AI for Multimedia Technologies (FG-EAI)

Transformative paradigm in which AI is integrated into physical bodies



Embodied interaction

+

Multimodal perception

Enhance ↓ Extend

next-generation Multimedia applications



Embodied AI for MultimediaTechnologies (FG-EAI)

Driven by its core capabilities, such as cognition, learning, and collaboration, EAI systems are now being designed to coexist and collaborate with humans in open, dynamic environments.

FG-EAI studies:

- **Interoperable platforms**
- **Multimodal frameworks**
- **Scalable system architectures**

Supporting a broad range of application domains, including:

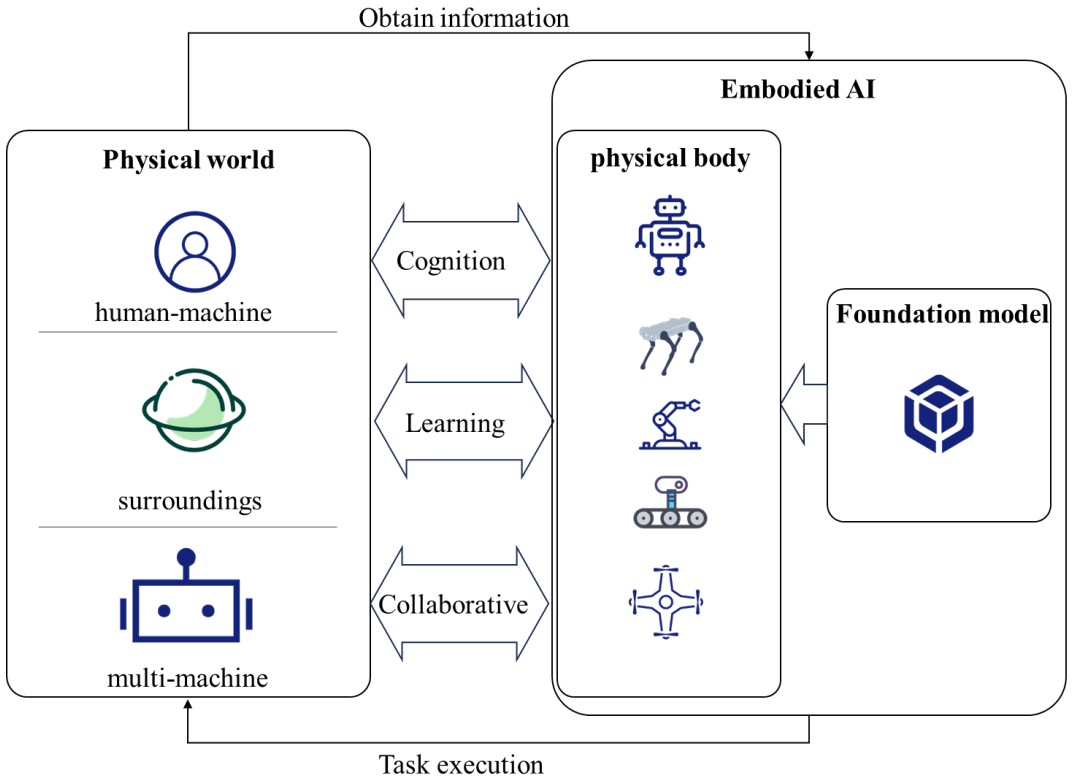
- **Smart manufacturing**
- **Public services**
- **Logistics**
- **Healthcare**
- **Home automation**

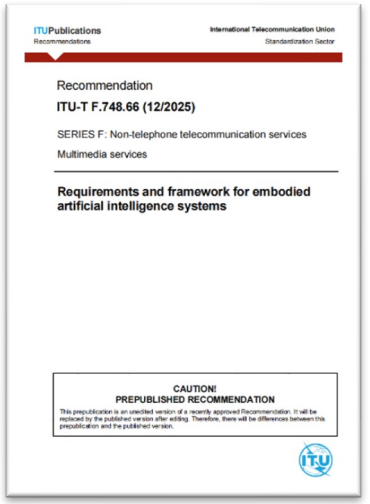
FG-EAI will study how EAI can support human-centric multimedia applications by examining its core technical abilities, such as understanding the physical world, learning from trial and error, and collaborating with humans and their environments.

It will investigate foundational technologies including real and virtual datasets, closed-loop control, world-model training, and advanced human–machine interaction.

Consensus has been reached for Embodied AI

Conceptual diagram and key features




ITUPublications
International Telecommunication Union
Recommendations
Standardization Sector

Recommendation
ITU-T F.748.66 (12/2025)

SERIES F: Non-telephone telecommunication services
Multimedia services

Requirements and framework for embodied artificial intelligence systems

CAUTION!
PREPUBLISHED RECOMMENDATION

ITU-T F.748.66 "Requirements and framework for embodied artificial intelligence systems"
Approved: Dec 2025

Definition

Embodied artificial intelligence(EAI):
Artificial intelligence integrated into physical systems that interact autonomously with and adapt to the physical world.

Timeline for FG-EAI



EAI Panel during AI4G



EAI Workshop during SG21 Plenary;
Established AHG-EAI

AHG-EAI 1st Meeting

AHG-EAI 2nd Meeting

19 February 2026 ITU-T SG21 established the FG-EAI, and officially issued the Circular

FG-EAI 1st Meeting
Established Working Structure (virtual)



FG-EAI 2nd Meeting & Workshop @ AI4Good
Established 22 work items



FG-EAI 3rd Meeting & Workshop in Hangzhou
Established 37 work items
Approved 2 deliverables

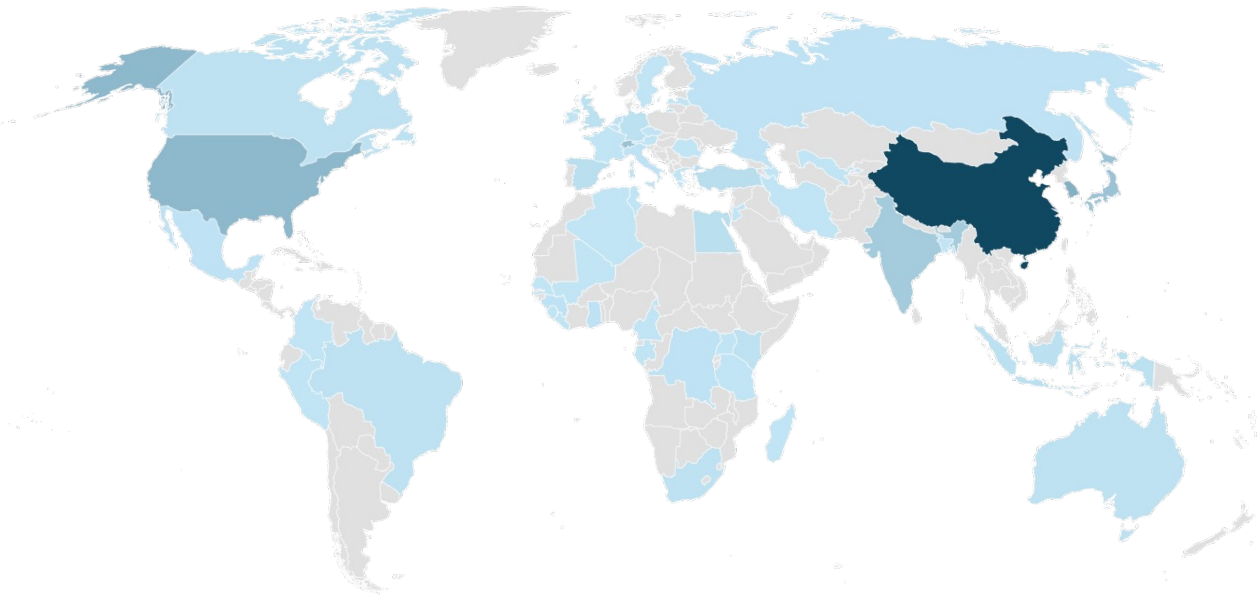
Jul 2025 | Oct | Nov | Dec | 2026 | Feb | May | Jul | Oct

2 WG interim meetings in June

19 WG/TG interim meetings in August - September

Global Participation and Current Progress

500+
experts



268
plenary documents

57
countries represented

57
ongoing work items

2
completed specifications

22 before Hangzhou + 37 newly established in Hangzhou = 59 work items (57 ongoing and 2 completed)

Ongoing work items by working group

PLEN	WG1	WG2	WG3	WG4	WG5	WG6	WG7	WG8	WG9
2	3	7	1	3	5	21	5	3	7

Note: including 3rd FG-EAI meeting in Hangzhou (13-16 October 2026)

FG-EAI Organizational Structure and Working Groups

Mission: To identify key technologies, conduct pre-standardization work, and facilitate standard adoption for enabling EAI, including for human-centric multimedia applications.

Vision: Trusted, safe, and inclusive development of EAI technologies.

Core Management team

Chair:

- Yuntao Wang (CAICT, China)

Vice-Chairs:

- Shin-Gak Kang (ETRI, Rep. of Korea)
- Avinash Agarwal (Ministry of Com, DoT, India)

FG-EAI Plenary

- **TG 0.1 Administration**
- **TG 0.2 Outreach and Engagement**
- **TG 0.3 Roadmap, Liaisons and Collaboration**

WG1 **Foundational Architecture & Terminology** Concepts, taxonomy, and reference architecture.	**WG2** **Multi-modal Data Framework** Data formats, lifecycle management, exchange, and reuse.	**WG3** **Models** EAI models, learning, reasoning, and verification.
WG4 **System Integration & Interfaces** Interfaces and integration across EAI system components.	**WG5** **Connectivity & Interoperability** Communication, coordination, and resource management.	**WG6** **Vertical Industry Applications** Industrial, mobility & logistics, household, healthcare, and smart grid applications.
WG7 **Human Alignment & Interaction** Human-aligned behavior, interaction, and accessibility.	**WG8** **Evaluation, Benchmarking & Testing** Methods, metrics, benchmarks, and testing procedures.	**WG9** **Ecosystem & Open Source** Open-source collaboration and ecosystem building.

FG-EAI PLEN Embodied AI for Multimedia Technologies

TGs Scopes:

Focuses on overall administrative coordination, the visibility of FG-EAI activities, and liaison with ITU Study Groups and other external SDOs. Provides strategic planning and maintains a roadmap of deliverables to support future standardization work for EAI technologies.

- **TG0.1** Administration
- **TG0.2** Outreach and Engagement
- **TG0.2** Roadmap, Liaisons and Collaboration



WG	TG	Reference	TITLE OF DELIVERABLE	Document
PLEN	TG0.3	TR-sl-ga	Standardization Landscape and Gap Analysis for Embodied AI for Multimedia Technologies	FGEAI-I-233
PLEN	TG0.3	TR-rm	Roadmap for Embodied AI for Multimedia Technologies	FGEAI-I-234

FG-EAI WG1 Foundational Architecture & Terminology

Scope:
To **provide the unified core definitions and terminology, and to establish a unified reference architecture and framework for EAI systems** with relevant use cases and requirements that enables interoperability, scalability, and consistent integration of data, models, systems, and services across heterogeneous environments.

- TG1.1 **Terminology**
- TG1.2 **Full stack EAI framework**



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG1	TG 1.1	TR-Term-analysis	Analysis for Embodied AI Terminology, Taxonomy, Ontology	FGEAI-I-099
WG1	TG 1.1	TS-Term-glossary	Glossary for Embodied AI	FGEAI-WG1-017
WG1	TG 1.2	TS-Ref-arch	Reference Architecture for Embodied AI	FGEAI-I-210

FG-EAI WG2 Multi-modal Data Frameworks (1/2)

Scope:
To **enable reuse and interoperability of multi-modal data across diverse scenarios and application domains**. It defines unified multimodal data formats for data collection, storage, transmission, and processing. WG2 further specifies comprehensive data lifecycle management principles and standardized data aggregation mechanisms to support efficient data exchange, integration, and reuse across heterogeneous EAI systems.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG2	-	TS-mda	Requirements for **Multimodal data acquisition procedures** for embodied AI systems	FGEAI-O-013
WG2	-	TS-psa3d	Physical-semantic and affordance-aware organization of **3D assets and scenes representation** for embodied AI	FGEAI-O-014

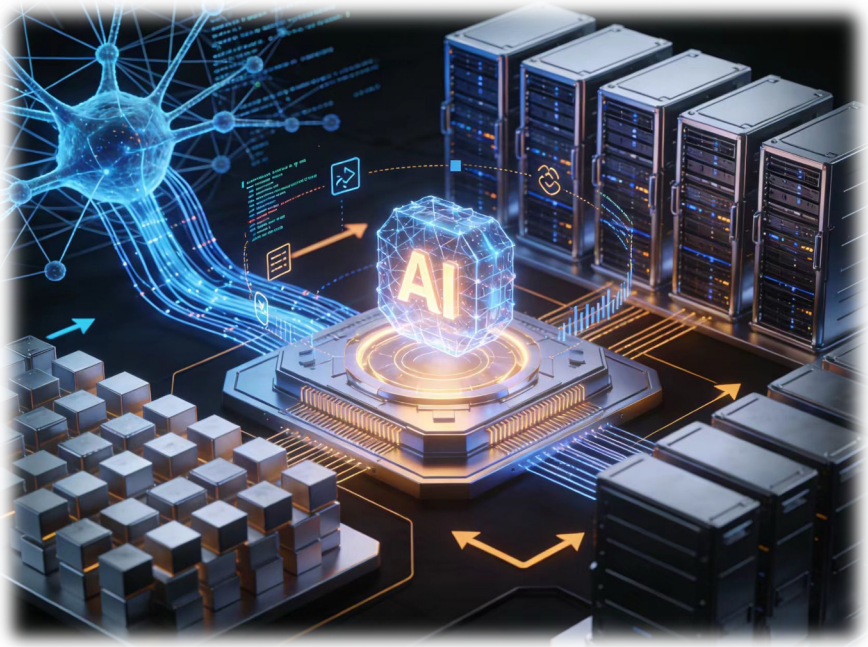
Approved at 3rd FG-EAI meeting

FG-EAI WG2 Multi-modal Data Frameworks (2/2)

WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG2	-	TS-mdmp	Requirements and framework for **Multimodal data management platform** supporting embodied artificial intelligence	FGEAI-I-217
WG2	-	TS-rf-sre	Requirement and **framework for constructing simulation-ready environment** for embodied AI	FGEAI-WG2-017
WG2	-	TS-pdse	Requirements for **data representation and format mapping in high-fidelity physical-digital twin simulation** environments for Embodied AI	TBD
WG2	-	TS-dar	**Data annotation** requirements for embodied artificial intelligence systems	FGEAI-I-218
WG2	-	TS-semdsp	Framework for **simulation-based embodied manipulation data synthesis platform**	FGEAI-I-219
WG2	-	TS-vdpp	Technical requirements for **visual data privacy protection** in embodied artificial intelligence systems	FGEAI-I-220
WG2	-	TS-vsd-pgis	Requirements for **virtual-synthetic data** in embodied AI power grid inspection scenarios	TBD

FG-EAI WG3 Models

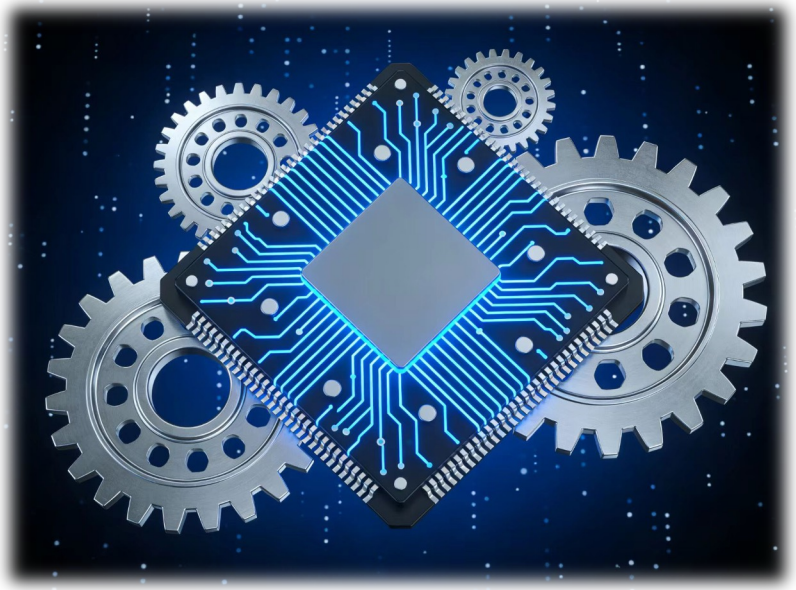
Scope:
To study EAI model and technologies to promote collaborative innovation, and **to improve the perception, learning, reasoning and collaboration capabilities of models**, as well as to verify model, capabilities and performance.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG3	-	TS-asd	**Affordance Sheet** to Document Multimodal Embodied AI Models	TBD

FG-EAI WG4 Systems integration and interfaces

Scope:
To study and promote the standardization of integrated systems and component interfaces that support embodied AI for multimedia-related applications. It will investigate system integration challenges across various system architectures and practical implementations and identify interface inconsistencies among key enabling components including perception systems, processing units, and execution modules, from a practical realization perspective.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG4&WG3	-	TS-hrbfm	**Requirements and interfaces for humanoid robot behaviour** foundation models in embodied artificial intelligence systems	FGEAI-I-248
WG4	-	TS-frici	Framework and **requirements for internal component interfaces** of embodied AI systems supporting multimedia applications	FGEAI-I-237
WG4	-	TS-afmi	Application framework and multimodal interfaces for embodied AI agents	FGEAI-I-238

FG-EAI WG5 Connectivity & Interoperability

Scope:
To study communication and collaboration for heterogeneous EAI systems, focusing on interoperability, agent communication, and large-scale collaborative deployment across diverse scenarios **to support collective intelligence**. It also studies core issues such as interoperability protocols, communication, scheduling, adaptation, and resource management in multi-agent collaboration environments.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG5	-	TS-ceca	**Cloud-Edge-End Collaborative Architecture** for Embodied AI: Use Cases, System Requirements and Architecture	FGEAI-I-200
WG5	-	TS-ciesics	Control Interfaces of Embodied Swarm Intelligence Collaborative System	FGEAI-I-201
WG5	-	TS-rfcmas	**Reference framework for collaboration** of multiple embodied AI systems	FGEAI-I-202
WG5	-	TS-fimec	Framework and interfaces between multimedia simulation platforms and EAI control modules	TBD
WG5	-	TR-ofcnes	Operational behaviour and fail-safe considerations for network-dependent embodied AI systems	TBD

FG-EAI WG6 Vertical Industry Applications (1/4)

Scope: **To promote the deployment of EAI multimedia technologies into various vertical industries. It focuses on use cases, requirements**, and special purpose EAI models and guidelines addressing relevant human-centric aspects of EAI applications and services from various vertical-industries, including manufacturing and mining, mobility and logistics, automotive systems, healthcare, household applications, entertainment, culture, critical infrastructure such us power grid and emergency communication, etc.

TG6.1	Industrial Environments
TG6.2	Mobility and Logistics Applications
TG6.3	Household Applications
TG6.4	Healthcare and Medical Applications
TG6.5	Smart Grid Applications
TG6.6	Tourism Application



FG-EAI WG6 Vertical Industry Applications (2/4) (use cases and requirements)

WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG6	TG 6.1	TS-urmme	Use cases and requirements for **multimodal media-based embodied AI services for manufacturing** environments	FGEAI-I-186
WG6	TG 6.1	TR-ve.eat	Analysis of **industrial use cases for Embodied AI training in virtual environments**	FGEAI-I-188
WG6	TG 6.1	TR-ssi.is	Use cases and standardization gaps for **shared spatial interpretation in industrial spatial computing** with embodied AI	FGEAI-I-187
WG6	TG 6.1	TS-urfe	Use cases and requirements for embodied AI services in firefighting and emergency rescue	FGEAI-I-189
WG6	TG 6.2	TS-emrmla	Use Cases and Functional Requirements for Embodied AI **Mobile Robots in Mobility and Logistics Applications**	FGEAI-I-211
WG6	TG 6.3	TS-urfhe	Use cases and requirements for Embodied AI **service in the household environment**	FGEAI-I-199
WG6	TG 6.3	TS-fprhs	Functional and **performance requirements for humanoid robots** in household scenarios	TBD

FG-EAI WG6 Vertical Industry Applications (3/4) (use cases and requirements)

WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG6	TG 6.4	TR-FGEAI-DHAI-State	State of Standardization for Embodied AI in **Healthcare and Life Sciences**: Interim draft report	FGEAI-I-194
WG6	TG 6.4	TR-FGEAI-DCAI	**Disability-Centred AI** in Healthcare and Medical Applications: **Data, Certification, and Evaluation Gaps**	FGEAI-I-196
WG6	TG 6.4	TR-DH-BCI	Overview of the Technology and Standards for the **Integration of Digital Health and Robotics through BCI**	FGEAI-I-193
WG6	TG 6.4	TS-FGEAI-DH-Pharm	Use Cases, Functional Requirements, and Reference Frameworks of **Embodied AI-Enabled Health and Pharmaceutical Manufacturing**	FGEAI-I-192
WG6	TG 6.4	TS-FGEAI-DH-LITL	Use Cases, Functional Requirements and Reference Frameworks of **Embodied AI-Enabled Lab-in-the-Loop Systems** for Healthcare and Life Sciences	FGEAI-I-195
WG6	TG 6.5	TR-ucsg	Use cases of embodied artificial intelligence in **smart grid**	FGEAI-I-222
WG6	TG 6.5	TS-fodrgis	Requirements and reference framework of embodied AI-enabled robots for foreign object detection and removal in gas-insulated switchgear compartments	FGEAI-I-223

FG-EAI WG6 Vertical Industry Applications (4/4) (use cases and requirements)

WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG6	TG 6.5	TR-srsg	**Standardization Roadmap** for Embodied Artificial Intelligence in Smart Grid	FGEAI-I-221
WG6	TG 6.5	TS-fisspg	Framework for embodied AI systems for **inspection and safety supervision** in power grid facility	FGEAI-I-224
WG6	TG 6.5	TS-FRIT	Framework and requirements for embodied AI systems of **internal inspection in oil-immersed power transformers**	FGEAI-I-228
WG6	TG 6.5	TS-TL-RLW	Functional requirements for **robotic live working on overhead transmission line fittings** using embodied artificial intelligence	FGEAI-I-231
WG6	TG 6.5	TS-rfeslw	Requirements and framework for embodied AI systems in **substation live working**	FGEAI-I-229
WG6	TG 6.5	TS-acs	Framework and functional requirements for embodied AI systems supporting **autonomous charging services for electric vehicles**	FGEAI-I-230R1
WG6	TG 6.5	TS-ermsg	Evaluation requirements and metrics for embodied artificial intelligence systems of substation inspection in smart grid	FGEAI-I-232

FG-EAI WG7 Human Alignment & Interaction

Scope:
To study and promote multimedia aspects of EAI's behaviors that align with human expectations and support the reliability and trustworthiness of products. It focuses on the behaviors of EAI which are consistent with intended human objectives and acceptable interaction principles.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG7	-	TR-mm-do	Multimedia Aspects of Dependability and Operability for Trustworthy Embodied AI	FGEAI-I-207
WG7	-	TR-hcv	Human Interaction and Decision Environments: Considerations for **Human-Centred Validation** in Embodied AI	TBD
WG7	-	TS-eaomf	Requirements and framework for explainable action output with multimedia feedback during autonomous execution of embodied AI	TBD
WG7	TG7.1	TR-Acc-up	Use Cases for Embodied AI to Support **Accessibility Needs from a User Perspective**	FGEAI-I-209
WG7	TG7.1	TS-Acc-interacts	**Guidelines for Accessible Interactions** in Embodied Artificial Intelligence Applications	FGEAI-I-208

FG-EAI WG8 Evaluation & Benchmarking

Scope:
to establish harmonized evaluation methodologies and benchmarking frameworks for embodied AI systems related multimedia technologies, **with the aim of assessing performance, reliability, safety, usability, and interoperability** across diverse platforms and application domains.



WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG8	-	TS-hmi	**Framework and evaluation methods for human-machine interaction** of embodied AI systems	FGEAI-I-205
WG8	-	TS-wm	**Evaluation requirements and methods for world models** for embodied artificial intelligence system	FGEAI-I-203R1
WG8	-	TS-LHTP	Evaluation requirements and methods for **long-horizon task performance** of embodied artificial intelligence systems	FGEAI-I-204

FG-EAI WG9 Open Source Ecosystem (1/2)

Scope:
To leverage open-source communities to **promote the sharing of software technologies and hardware designs**, including models, data and code for EAI systems. It connects stakeholders from industry, academia, research, and application sectors **to build an open and collaborative ecosystem and promote efficient sharing of open-source resources** and technical collaboration and interoperability.



FG-EAI WG9 Open Source Ecosystem (2/2)

WG	TG	Reference	TITLE OF DELIVERABLE	Document
WG9	-	TR-goseco	**Global Embodied AI Open Source Ecosystem** Report	FGEAI-I-244
WG9	-	TS-eegsa	**Open interfaces, evaluation methods and open-source reference implementation** for EEG-guided shared autonomy in robotic manipulation	FGEAI-I-246
WG9	-	TS-vts	Open interfaces and evaluation methods for **visuotactile skills in VTLA-based dexterous manipulation**	FGEAI-I-245
WG9	-	TR-Real2Sim	**Bridging Simulation and Reality**: Real2Sim, System Identification and Sim2Real Transfer Methods for Embodied AI	FGEAI-I-240
WG9	-	TR-SimEvaluation	**Simulation-based Evaluation for Embodied AI**: Reproducibility, Metrics and Sim-Real Correlation	FGEAI-I-241
WG9	-	TR-SimInterop	**Embodied AI Simulation Interoperability**: Interfaces, Asset Formats and Scenario Description	FGEAI-I-242
WG9	-	TR-TrainingInfra	**Shared Physical AI Training Infrastructure**: Architecture, Data Governance and Interconnection	FGEAI-I-243

FG-EAI Future Meeting Plan

3rd Meeting

October 13th to 16th held in person in Hangzhou, China

4th Meeting (TBD)

Planned for 8-11 March 2027 in Geneva.

5th Meeting (TBD)

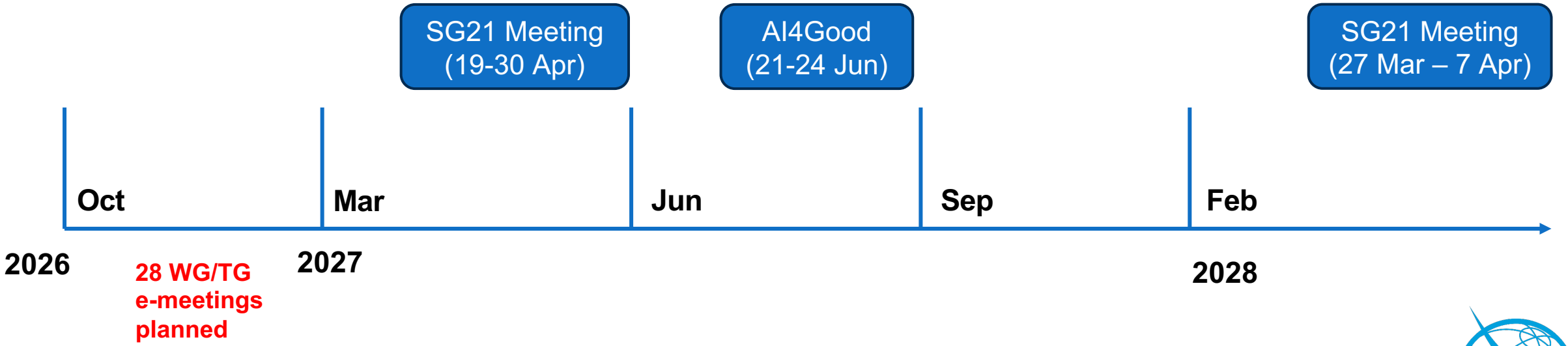
Tentatively planned for June 2027 co-located with AI4Good in Geneva.

6th Meeting (TBD)

Tentatively planned for September/October 2027.

7th Meeting (TBD)

Tentatively planned for February/March 2028.



Between focus group meetings, the working groups/task groups may convene their own meetings as needed to ensure timely progress of the related research work.

10th Anniversary

GISC 2026

Global ICT Standards Conference 2026

- Thank you -

Stefano Polidori, Counsellor, ITU

CONTACT: tsbfgeai@itu.int

ICT Standards and Intellectual Property:
Shaping the Physical AI

주최 과학기술정보통신부 지식재산처 주관 국립전파연구원 TTA IITP KEA kista ETRI