# FG-EAI

## Consensus, standards and an open ecosystem

### Progress and next priorities

ITU Focus Group on Embodied AI for Multimedia Technologies

| 01 CONSENSUS | 02 STANDARDS | 03 ECOSYSTEM |
| --- | --- | --- |
| F.748.66 and the preparation | Three plenaries and Hangzhou results | Standards, testing and open collaboration |

Hangzhou, China | 16 October 2026

# F.748.66 and the consensus behind FG-EAI

## Technical foundation

### ITU-T F.748.66

Requirements and framework for embodied AI systems




**Approved 14 Dec 2025**

Perception
Decision-making
Execution
Interaction
Learning

Shared definition: AI in physical systems that interact autonomously with, and adapt to, the physical world.

## A year of preparation and international exchange



**July 2025**

AI for Good discussion
Industry and research



**October 2025**

ITU workshop
Use cases and gaps



**December 2025**

Seoul EAI Knowledge Lab
International exchange

### AHG-EAI: two meetings to define the way forward

Focus-group scope and working mechanism
Cooperation with other standards bodies
Open-source benchmarking and implementation communities

**19 February 2026: SG21 established FG-EAI on a shared technical and organizational foundation.**

Sources: ITU-T F.748.66; supplied V4; AHG-EAI terms of reference and meeting records; SG21 establishment notice.

# The programme after Hangzhou

**57**
countries represented

**500+**
experts in cumulative records

**225**
cumulative documents

**57**
ongoing work items

**2**
completed specifications

**3 plenaries | 9 working groups | 21 interim meetings**

## Ongoing work items by responsible group

| TG0.3 | WG1 | WG2 | WG3 | WG4 | WG5 | WG6 | WG7 | WG8 | WG9 |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | 7 | 1 | 3 | 5 | 21 | 5 | 3 | 7 |

## 29 before Hangzhou + 30 new − 2 completed = 57 ongoing

Completed: TS-mda and TS-psa3d. TS-hrbfm is established and counted once under WG4.

Participation includes Hangzhou registration records. Expert count is rounded to allow for name variations.

Sources: participant/registration records; nine WG reports and TG0.3; closing-plenary confirmations.

# First plenary: scope, structure and responsibilities

6–7 May 2026, online | 163 participants from 34 countries

**May agreement: nine WG scopes, accessibility under WG7 and an invitation to collaborate**

| | | |
|---|---|---|
| **WG1** Architecture and terminology<br>Shin-Gak Kang, ETRI | **WG2** Multimodal data frameworks<br>Kei Kawamura, KDDI | **WG3** Models<br>Andrea Cavallaro, EPFL |
| **WG4** System integration and interfaces<br>Rongwei Ren | **WG5** Connectivity and interoperability<br>Tony Zeng, Huawei | **WG6** Vertical industry applications<br>Hongki Cha, ETRI |
| **WG7** Human alignment and interaction<br>Avinash Agarwal, DoT, India | **WG8** Evaluation and benchmarking<br>Weimin Zhang, CAICT | **WG9** Open-source ecosystem<br>Emily Chen, Dexmal |

**Current FG leadership** Chair: Yuntao Wang | Vice-Chairs: Shin-Gak Kang and Avinash Agarwal

**May outputs: O-001 working structure and scope; O-002R2 invitation to collaborate**

Sources: May report O-003; O-007R1 and current WG reports. Leadership shown is current organizational context.

# Second plenary: a 22-item technical programme

11 July 2026, Geneva | 139 participants from 20 countries

## Technical programme agreed

**22**

**15 technical specifications**
**7 technical reports**

**6 June-origin items + 16 July additions**

### Foundations and data

Architecture and terminology
Multimodal data acquisition and management

### Systems and applications

Cloud-edge collaboration and industry requirements
Accessibility and human-centred interaction

## Working arrangements and next steps

### TG0.3: two reports established

TR-sl-ga: standardization landscape and gaps
TR-rm: standardization roadmap

### A live work programme

I-036 adopted as the programme baseline
Document-processing guidelines agreed

### WG/TG appointments and reviews

WG4 chair and WG3/WG7 vice-chairs appointed
Interim reviews and the Hangzhou meeting planned

**Incoming liaisons noted: FG-AINN, IEC TC 100, ITU-T SG17 and SG13.**

Source: second plenary report O-007R1, sections 2, 4, 6.0, 7, 8 and 10.

# Twenty-one interim meetings and their technical results

## 2 meetings in June + 19 in August–September = 21 interim meetings

| Meeting owner | Number |
|---|---|
| June: WG1 and WG7 | 2 |
| Aug–Sep: TG0.3 | 2 |
| WG1 and its TGs | 4 |
| WG2 | 2 |
| WG4 | 1 |
| WG5 | 2 |
| TG6.1–TG6.5 | 6 |
| WG7/TG7.1 jointly | 1 |
| WG8 | 1 |

## Technical results between plenaries

### June: the first six items

Terminology, reference architecture,
human alignment and accessible interaction

### Seven additions after the July plenary

Data: TS-rf-sre, TS-psa3d and TS-pdse
Interfaces: TS-frici
Industry: virtual training and spatial interpretation
Evaluation: TS-wm

**Programme: 6 in June | 22 in July | 29 before Hangzhou**

**Interim reviews let contributors shape definitions, interfaces and draft requirements.**

Sources: O-007R1, O-011 and pre-Hangzhou I-153R1. Joint and multi-day meetings count once.

# Hangzhou: two completions and 30 new work items

Third plenary, Hangzhou, 13–15 October 2026

**2 completed specifications | 30 new work items | 57 ongoing items**

## TS-mda

### Multimodal data acquisition procedures

Acquisition purpose and action–observation records
Quality checks and traceability



Inspection example
Record the action, conditions and intended use of the collected data.

## TS-psa3d

### Physical, semantic and affordance-aware organization of 3D assets and scenes

Physical properties and scene meaning
Possible robot interactions



Manipulation example
Describe how an object can be grasped and used in a scene.

**The first completed outputs provide shared procedures and data descriptions for implementation.**

Sources: WG2 I-216, O-013, O-014 and closing-plenary confirmations. Images are AI-generated concepts illustrating scope.

# Hangzhou foundations: architecture, data and models

## WG1 | Architecture and terms

### 3 ongoing items

**Hangzhou outcomes**

Updated architecture agreed
Terminology harmonization method adopted

**Work programme**

TR-Term-analysis
TS-Term-glossary
TS-Ref-arch

**A shared vocabulary and system structure for all working groups**

## WG2 | Multimodal data

### 7 ongoing + 2 completed

**Hangzhou outcomes**

TS-mda and TS-psa3d completed
TS-mdmp baseline updated
Four new work items established

**New research directions**

Annotation and manipulation data
Visual-data privacy
Synthetic data for grid inspection

**Also: simulation environments and digital-twin mapping**

## WG3 | Models

### First work item established

**TS-asd: affordance sheets**

Document model capabilities and the conditions under which those capabilities apply

**Further contributions invited**

Model risks and physical hallucinations
Explainability and transparency
Training data and ethical boundaries

**Architecture, data and model documentation provide a common basis for integration.**

Sources: WG1 I-247R1; WG2 I-216; WG3 I-227. Future model topics are invitations for contributions.

# Hangzhou integration: component and network interfaces

## WG4 | System integration and interfaces

**3 ongoing | 1 updated text + 2 new items**

### TS-frici

Internal component interfaces, aligned with
WG1 architecture and multimodal perception

### TS-afmi

Application framework and multimodal interfaces
Links to WG2 data and WG3 model work

### TS-hrbfm

Humanoid behaviour-model interfaces
Body and skeleton configuration
Joint WG3/WG4 coordination, owned by WG4

## WG5 | Connectivity and interoperability

**5 ongoing | 3 baseline updates + 2 new items**

### Updated: TS-ceca, TS-ciesics, TS-rfcmas

Cloud-edge-end architecture, swarm control
and collaboration across EAI systems

### New: TS-fimec and TR-ofcnes

Simulation-platform and control-module interfaces
Operational and fail-safe behaviour under
network constraints

### Coordination with SG15

Liaison prepared on connectivity
and interoperability

**Engineering focus: verify task completion and specify behaviour when connectivity degrades.**

Sources: WG4 I-250 and confirmed TS-hrbfm establishment; WG5 I-235. Agreed baselines remain under development.

# WG6: 21 application items, including 12 new items

**21 ongoing items | 12 new: 1 industrial + 1 household + 5 healthcare + 5 grid**

## Industry | 4 items

Manufacturing, virtual training and spatial interpretation
New TS-urfe: firefighting and emergency rescue

## Healthcare | 5 new items

Pharma manufacturing and labs
Disability-centred AI
Brain-computer interfaces
Standardization landscape

## Smart grid | 9 items / 5 new



Transformer inspection
Transmission-line live working
Autonomous charging
Substation inspection evaluation

Also: use cases, roadmap and safety supervision.

## Mobility and logistics | 1 item

TS-emrmla
Mobile-robot service requirements and architecture

## Household | 2 items

Household service requirements
New TS-fprhs on humanoid robots in household services

**New TG6.6 on tourism applications opens another route for industry requirements and use cases.**

Source: WG6 I-249. Photo: supplied smart-grid inspection case in I-222. Tourism TG6.6 has no established item yet.

# Human alignment, evaluation and open source

## WG7 | Human alignment

### 5 ongoing items

**3 baselines agreed**
**1 new work item**

**Dependability and accessibility**

TR-mm-do: initial baseline
TR-Acc-up and TS-Acc-interacts: updated accessibility baselines

**TS-eaomf established**

Explainable action output with multimedia feedback
Initial baseline to be developed

## WG8 | Evaluation

### 3 ongoing items

**2 updated baselines**
**1 new work item**

**Three evaluation subjects**

TS-hmi: interaction assessment
TS-wm: world-model evaluation
TS-LHTP: long-horizon tasks

**Input to SG21**

Agreed review of draft F.BA-EAI
Outgoing liaison O-012 to SG21/Q5

## WG9 | Open-source ecosystem

### 7 ongoing items

**7 new baselines accepted**
**3 rounds of review**

**Five technical reports**

Ecosystem mapping and Real2Sim
Simulation evaluation
Interoperability and shared training

**Two technical specifications**

TS-eegsa: supervised manipulation
TS-vts: visuotactile skill interfaces

Sources: WG7 I-213, WG8 I-206, WG9 I-239R1. An established item or baseline is distinct from a completed specification.

# Next priority 1: deepen the standards programme

## Common foundations — WG1 / TG0.3

Resolve terminology and architecture dependencies. Develop the landscape and roadmap.

Contribute definitions, architecture mappings and evidence of standardization gaps.

## Data and model requirements — WG2 / WG3

Advance annotation, privacy, simulation assets and model affordance sheets.

Contribute data schemas, acquisition records, model capabilities and operating conditions.

## Interoperable system interfaces — WG4 / WG5

Specify component, humanoid-model, cloud-edge and simulation-control interfaces.

Contribute interface descriptions, message exchanges and failure/recovery cases.

## Applications and measurable performance — WG6 / WG7 / WG8

Connect industry requirements with accessibility, human oversight and long-horizon tests.

Contribute representative tasks, operational constraints and reproducible evaluation evidence.

**December reviews: WG1 10 Dec | Architecture TG 15 Dec | WG8 16 Dec | WG3 18 Dec**

Sources: WG reports and TG0.3 I-236. Priorities are synthesized; planned dates remain subject to coordination.

# Applying ITU standards through EAI Bench

## ITU standards basis

### ITU-T F.748.66 | Approved

System framework and capability requirements
Perception, decision-making, execution and interaction

### ITU-T F.BA-EAI | Draft

Framework for benchmarking and assessment
WG8 review agreed, liaison O-012 to SG21/Q5

## EAI Bench | Testing experience

**15**
scenario tracks

**14**
generalization checks

**3**
disturbance levels

**Models and complete systems**
**Common tasks with controlled test conditions**

## WG8's ongoing work is integral to the EAI Bench evaluation framework

### TS-hmi | Human interaction

Capability framework and methods for evaluating human-machine interaction

### TS-wm | World models

Video quality and prediction
Control, physical and long-term consistency

### TS-LHTP | Long-horizon tasks

Task progress and checkpoints
Errors, replanning and recovery
Human intervention

Sources: ITU-T F.748.66; WG8 I-206 and O-012; CAICT EAI Bench methodology. Coverage figures describe methodology.

# Next priority 3: standards and open ecosystems

## Develop technical text, implementation and testing together

### Technical drafts

Specify interfaces, data formats and evaluation requirements.

### Reference implementations

Test whether interfaces support interoperable systems.

### Reproducible tests

Use implementation evidence to refine draft text.

### OpenITU, GitHub and external communities

Connect developers, labs and application owners
Contribute projects, interface proposals and implementation evidence

### Initial areas for open collaboration

Simulation interoperability and Sim2Real transfer
Shared training infrastructure
EEG-guided and visuotactile manipulation

## Global EAI Open Source Ecosystem Report: target milestones

| Dec 2026 | Jan 2027 | Feb 2027 | Mar 2027 | Jun 2027 |
|---|---|---|---|---|
| Collect project data and cases | Global expert review | Revise the report | Target final draft | Multilingual release |

Source: WG9 I-239R1. OpenITU/GitHub engagement and reference implementations are planned or exploratory.

# Thank you

## We welcome your participation in FG-EAI

Contribute technical proposals, implementation experience
and reproducible evaluation evidence

**www.itu.int/en/ITU-T/focusgroups/eai/Pages/default.aspx**

Hangzhou | 16 October 2026