Internation Workshop on Phsical-Aware Intelligence and Cognitive Modelling

Held in conjunction with IEEE CyberSciTech 2025

October 21-24, 2025, Hakodate City, Hokkaido, Japar

Aim and Scope

Physical-Aware Intelligence has emerged as a crucial capability for intelligent systems operating in real-world, dynamic environments. Unlike conventional AI systems that rely heavily on abstract data representations, physical-aware systems are grounded in sensorimotor experiences, allowing them to perceive spatial structures, understand environmental dynamics, and respond to physical interactions in contextually appropriate ways. This awareness enables machines to bridge the gap between digital cognition and the physical world, forming the foundation for robust, context-sensitive behaviors in robotics, autonomous systems, and cyber-physical environments.

Cognitive Modeling plays a central role in endowing intelligent systems with the capacity to interpret complex information, infer latent causes, and generate structured internal representations that guide reasoning and decision-making. Inspired by cognitive science and neuroscience, cognitive models provide a framework for explaining how intelligent agents can learn from limited data, generalize across tasks, and adapt to new scenarios. When integrated with physical perception, cognitive modeling enables intelligent systems to go beyond reactive behaviors, supporting predictive, explainable, and human-aligned actions in uncertain and multi-modal environments.

This workshop aims to bring together researchers from artificial intelligence, robotics, cognitive science, neuroscience, and cyberphysical systems to explore the intersection of physically-aware intelligence and cognitive modeling. We welcome researchers to discuss and examine ongoing research on cyber-physical intelligent.

Topics of interest include, but are not limited to:

- ♦ Physical-aware and sensor-grounded intelligence
- Cognitive modeling for physical interaction and understanding
- Embodied and situated AI agents
- ♦ Environmental context modeling and perception reasoning
- Multimodal sensory integration
- ♦ Learning from physical dynamics, motion, and force
- Simulation-to-real-world transfer in embodied AI

- ♦ Neuro-symbolic models for physical-world cognition
- Explainable and interpretable models for physical behavior understanding
- ♦ Cognitive architectures for robotics and CPS
- Human-robot collaboration in dynamic physical environments
- ✤ Cognitive digital twins and intelligent physical simulations
- ♦ Safety, robustness, and ethics in physically-aware system

Submission and Publication

Please follow the guideline in IEEE CyberSciTech 2025 Submission Site to submit your work via EDAS (<u>https://edas.info/N33760</u>). The submitted papers should be 4-6 pages long including figures and references, and prepared in IEEE CS Proceedings format. IEEE formatting info: <u>http://www.ieee.org/conferences_events/conferences/publishing/templates.html</u>

We also welcome **Position Statement Papers** (2-4 pages), which present novel ideas, hypotheses, and emerging research directions in Physical-aware intelligence and Cognitive Modelling. These papers should be prepared in IEEE CS Proceedings form at and will be peer-reviewed for novelty and impact.

At least one of the authors of the accepted paper is requested to register and present the paper at the conference in **hybrid mode** (in person or virtually). All accepted papers will be published in an IEEE Computer Society proceedings (IEEE-DL and El indexed).

Important Dates	Organizers	
		General Chair: Xin Xie, Tianjin University, China
Submission Deadline	June 27, 2025	Program Chair:
Acceptance Notification	August 11, 2025	Xiaoyi Tao, Tianjin University of Commerce, China
		Caijuan Chen, National Institute of Informatics, Japan
Camera-ready Submission	September 12, 2025	Contact E-mail: phyaicm@gmail.com