

T8. COGNITIVE ROBOTICS, EMBODIED AI & HYBRID LEARNING ENVIRONMENTS

Scope:

Examines how **physical and embodied AI systems** engage in learning, teaching, or skill acquisition through sensory, motor, and social interaction.

Focus on co-adaptive behavior, embodied cognition, and safe deployment of robotic and hybrid AI agents in educational contexts.

A. SOCIAL & ASSISTIVE ROBOTS FOR LEARNING

socially assistive robotics; human–robot collaboration; robot-mediated learning; adaptive affective behavior; empathy modeling in robots; multimodal social interaction; peer learning with robots; robot tutor design; classroom robot integration; gaze and gesture coordination; social presence modeling; inclusion and accessibility robotics; robot-assisted language learning; developmental robotics for education; long-term HRI adaptation; trust and acceptance calibration; ethical co-learning protocols; explainable robot behavior; teacher–robot co-orchestration; cross-cultural HRI in learning.

FOCUS: design and deployment of **socially and affectively intelligent robots** that collaborate, communicate, and co-learn with humans — emphasizing inclusivity, trust, and long-term adaptation.

B. EMBODIED SKILL LEARNING & AUTONOMOUS NAVIGATION

embodied cognition in learning; motor skill acquisition; reinforcement learning for physical tasks; imitation learning and demonstration-based instruction; robot learning from observation; procedural learning automation; hybrid embodiment frameworks; embodied simulation environments; perception–action coupling; multimodal sensor integration; embodied feedback systems; safe motion planning; adaptive manipulation; simulation-to-real transfer (Sim2Real); cognitive mapping and spatial learning; autonomy calibration in educational robots; co-adaptive robotics and scaffolding; physical telepresence learning; task-level policy learning; embodied ethics and safety assurance.

FOCUS: research on **robots and embodied agents that learn or teach procedural, spatial, and cognitive skills**, focusing on co-adaptation, perception–action learning, and safety in real-world environments.