PLENARY TALK

Implementation of Brain-Inspired Multi-Sensory Integration and Decision Making using Embodied Robotic Platforms

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Abstract:

Cutting-edge AI, AGI, ChatGPT and other advanced computational technologies demonstrate outstanding performance in many important tasks requiring intelligent data processing under well-known conditions. Generative AI requires huge amount of data and computational resources, and real-time robotics applications cannot rely only on such brute power of AI. They need to develop their own intelligent control system within the constraints represented by their physical body, leading to the need for situated cognition and embodied robotics. Results of cognitive science and brain-monitoring provide valuable support to develop embodied robotics approaches. This talk overviews the achievements and challenges to intelligent systems today, outlines crucial insights from brain studies. It introduces brain-inspired system designs combing the benefits of advanced AI/AGI and neuromorphic technologies. Applications include intelligent control and decision making, robot autonomy, human-robot and robot-robot interaction.

Bio:

Robert Kozma (Fellow IEEE, Fellow INNS) Ph.D. in Applied Physics (1992), Delft University of Technology, The Netherlands. He has MSc in mathematics from Eotvos University, Budapest, Hungary, and in power engineering from Moscow Energy Institute, Russia. He has been Professor of Computer Science and Mathematics at University of Memphis since 2000, where he was the founding Director of the FedEx Center for Large-Scale Intelligent Optimization & Networks. He is also Professor at Obuda University, Hungary. Previous faculty positions held at the University of California at Berkeley, USA; Otago University, Dunedin, New Zealand; Tohoku University, Sendai, Japan. Past affiliations include US Air Force Research Laboratory; NASA Jet Propulsion Lab; Lawrence Berkeley Lab; Sarnoff Co., Princeton; U. Massachusetts, Amherst. He has 9 book volumes, around 400 papers, and 3 patents. Dr. Kozma has been the President of the International Neural Network Society (INNS), served on the Board of Governors (BOG) of the IEEE SMC Society, the AdCom of IEEE CIS, and BOG of INNS. He is EIC of IEEE Transactions on SMC: Systems. He is recipient of INNS Dennis Gabor Award.