Péter Galambos
Óbuda University, Budapest, Hungary
peter.galambos@irob.uni-obuda.hu

Generative Neural Models in Robotics: Pioneering the Embodied AI Revolution

Abstract: The concept of machines with the capability for self-reproduction and the creation of useful artifacts has intrigued thinkers like John von Neumann, whose seminal contributions continue to influence contemporary technology. Yet, the modern discourse has evolved, emphasizing machines' autonomous performance of beneficial tasks over self-replication. This shift is markedly noticeable in domains such as transportation, elderly care, household management, and manufacturing, where the past decade has witnessed a gradual but consistent advancement. This progress is characterized by innovations in specialized tasks and tools, which, however, lack integration into a cohesive universal framework. Conversely, the growth in AI fields not inherently tied to physical interaction has seen an exponential rise, fueled by significant increases in the resources allocated for developing neural models. This surge has led to groundbreaking commercial innovations in textual, visual, and auditory content generation becoming widely accessible in remarkably short times. Yet, the question remains: How do these advances in generative AI translate to the physical realm, particularly in enhancing robotic capabilities? My presentation delves into this inquiry, analyzing it through the prism of cutting-edge research and emerging trends, aiming to shed light on how generative neural models are spearheading the revolution in Embodied AI.

Bio: Péter Galambos (Member, IEEE) received the M.Sc. and Ph.D. degrees in mechanical engineering from the Budapest University of Technology and Economics, Budapest, Hungary, in 2006 and 2013, respectively.,He was a Research Intern with Toshiba Corporate Research and Development Center, Kawasaki, Japan, from 2007 to 2008, then joined the Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA-SZTAKI), Budapest, where he held a “Young Researcher” Scholarship from 2010 to 2012. From 2011 to 2015, he served as a Team Leader with MTA SZTAKI and coordinated the development of the VirCA VR system and its research applications. He joined Óbuda University, Budapest, in 2013, participating in robotics-related research and development activities and education. He is currently the Director of the Antal Bejczy Center for Intelligent Robotics and the Deputy Director of the University Research and Innovation Center, Óbuda University. His research interests include advanced industrial robotics and control systems, cyber–physical systems, and virtual reality.