The Great Robot Accelerator: Collective Learning of Optimal Embodied AI

Prof. Dr. Sami Haddadin

Technische Universität München

Robots have achieved unprecedented performance jumps over the last decade. As of today, however, robot design and build are laborious and suboptimal, costly and constitute a major limitation in achieving the anticipated robotics revolution. At the same time, we see intelligent machines that learn and perform tasks, and are able to generalize their skills to new contexts. However, robot learning faces seemingly unsolvable hurdles such as disembodied machine learning not being able to leverage our understanding of the physical reality, finding energy and time efficient solutions, or generalize to complex and dynamic manipulation skills. In this talk, I will discuss the autonomous Co-Evolution of Embodiment and Intelligence as the central challenge of robotics. Only, when robots will evolve in an AI-propelled highly evolutionary process, we can finally reach the tipping point and automatically synthesize general purpose robots. I will introduce the concepts of Collective Learning and Optimal Embodied AI as two main pillars vital to this transformation towards an AI-Accelerated Robot Evolution.