

International Conference on Intelligent Machine Age 2025: Advancing Robotics, Automation, Semiconductors, and Next-Gen Space & Automotive Technologies

Conference Proceedings

November 27-28, 2025 - Japan

Can Robots Have Consciousness – What Does Mathematical Science Say About This?

Ralf Otte

Ulm University of Applied Sciences, Germany

Abstract

Although AI has currently triggered global hype, its applications are subject to narrow limits, which are often ignored today. AI is ideal for mathematical and big data environments, but it has massive difficulties in practical applications in natural environments, as can be clearly seen in the obstacles facing mobile robotics and autonomous driving in the natural environment. In particular, inductive AI has serious difficulties with all applications in the extrapolation space and in the area of small data. Humans, on the other hand, can make the right decisions with just a few data sets (sometimes a single hot stove is enough for a child). Human brains and current AI systems are fundamentally different. Particularly serious is the complexity limit that cannot be overcome by any current AI, which is represented by second-order predicate logic. No AI system in the world today can systematically exceed this limit, while even children have no problems with it. AI should therefore evolve from algorithmic AI to dedicated neuromorphic AI. The lecture will show how. Ultimately, the lecture presents mathematical possibilities for describing qualia and consciousness and outlines hypotheses on how consciousness could be generated on technical systems (machine consciousness). The theory presented thus bridges the gap between natural science and Japanese Shintoism, as Shintoism not only appears to have evidence, but can also be strictly mathematically justified.