

Invited Keynote: Autonomous Systems Inspired by Biology

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Abstract. We can currently see the rapid formation of an exciting multidisciplinary field focusing on the application of biological principles and mechanisms to develop autonomous systems (software agents and robots) that act highly flexible and robust in the face of environmental contingency and uncertainty. In this talk I will give an overview of various aspects of this field. The state of the art will be illustrated with diverse examples of bio-inspired approaches to system adaptivity, functional and structural optimization, collective and swarm behavior, locomotion, sensor-motor control, and (co-)evolution. A focus will be on representative work on biologically inspired autonomous systems done at the Swarmlab of Maastricht University, including recent research motivated by the behavior of social insects such as bees and ants.

About the Speaker

Gerhard Weiß is full professor of artificial intelligence and computer science and head of the Department of Knowledge Engineering (DKE), Faculty of Humanities and Sciences, Maastricht University. Before joining Maastricht University in 2009, he was the Scientific Director of Software Competence Center Hagenberg GmbH, Austria, and Assistant Professor at the Department of Computer Science of Technical University Munich, Germany. He received his PhD (Dr. rer. nat.) in computer science from Technical University Munich and his Habilitation degree from Johannes-Kepler University Linz, Austria. His main interests are in the foundations and in practical applications of artificial intelligence, multi-agent technology, and autonomous and cooperative systems. He is editorial board member of several journals related to his research fields, and he has been in the program and steering committees of various international conferences and workshops. He was a Board member of the International Foundation for Autonomous Agents and Multi-agent Systems (IFAAMAS) and of two European networks of excellence (Agentlink and Exystence). Professor Weiss has served as a reviewer for several national, European and international research funding organizations and has been engaged as a scientific consultant and advisor for industry. For more information, please visit <http://www.weiss-gerhard.info>.