

Charles University
Faculty of Mathematics and Physics

Cordially invites you to

3rd Matoušek's Lecture

Engineering

AI Agent Societies:

The Cognitive Hourglass

Given by

Prof. Franco Zambonelli, Ph.D.
(University of Modena and Reggio
Emilia, Italy)

On Wednesday, May 27, 2026
at 2 p.m.

In Matoušek's Auditorium (N1),
MFF UK
V Holešovičkách 747/2, 180 00 Praha 8

Abstract: Recent advances in AI are driving an unprecedented and fast-paced development of myriads of powerful agent tools and applications, mostly based on generative AI technologies and increasingly involving multiple collaborative agents. However, the lack of solid conceptual abstractions and engineering foundations, as well as clear principles driving their design, may hamper the building of complex AI agent societies, eventually limiting their trustworthiness, applicability, and evolution.

In this context, we argue that such a set of abstractions should constitute the narrow neck of an indispensable "cognitive hourglass": a level of abstraction meant to be useful for humans to understand, design and control agents and complex agent societies, regardless of the specific AI technologies adopted at the implementation level and of the specific application context.

In the talk, I will start from the key concepts associated with individual and social cognitive activities, present the idea of the cognitive hourglass, motivate its need, sketch its envisioned architecture, and eventually identify the research challenges for its realization.

Franco Zambonelli is a full professor of Computer Science at the University of Modena and Reggio Emilia. He got his PhD in Computer Science and Engineering from the University of Bologna in 1997. His research interests include: distributed AI and multi-agent systems, self-adaptive and self-organizing systems, with applications to healthcare and smart cities.

In these areas, he has published over 130 papers in peer-reviewed journals and has been an invited speaker at multiple conferences and workshops. He is on the editorial board of the Springer-Nature Computer Science Journal, the IEEE Society & Technology Magazine, the BCS Computer Journal, the Journal of Pervasive Computing and Communications.

He has been the scientific manager of the EU FP6 Project CASCADAS and coordinator of the EU FP7 Project SAPERE and of the PRIN 2017 Project Fluidware. He is an ACM Distinguished Scientist, a member of the Academia Europaea, an IEEE Fellow, and a recipient of the 2018 IFAAMAS Influential Paper Award.