



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ARTIFICIAL INTELLIGENCE

A game-changing technology that is bringing transformative change to societies and industries world-wide.

Artificial Intelligence is a very strong and wide field of research at the University of Bologna. It covers both theoretical and technological aspects but also legal, social and economic aspects of AI. Application areas include: manufacturing, agriculture, health, security and forensic, energy, environment, mobility, egovernment, and IoT.

The research activities cover a wide range of issues: Adaptive and self-organising complex systems (simulation tools for “what-if” analysis; information theory and complexity; interaction mechanisms and patterns; swarm robotics and swarm intelligent systems); Deductive, hypothetical and temporal reasoning (reactive event calculus for complex event processing; abduction for hypothesis-based reasoning; knowledge-based reasoning); Hybrid Optimization, decision support systems (machine learning; simulation and optimization; on-line and off-line optimisation under uncertainty; constraint programming tools); Knowledge representation and management (web services orchestrations; data-aware business processes; socio-technical systems); Verification and monitoring (business Processes management; verification and monitoring of process executions; properties of execution traces); Computer vision (video analysis for applications of video surveillance; image analysis and scene understanding; pattern recognition and signal processing); Natural Language processing (machine translation: corpora and methodologies; argumentation mining; deep learning for natural language processing); Human-Machine Interface (brain-computer interfaces; multi-sensory integration; gesture recognition; virtual and augmented reality); Ethical, legal, social and economic aspects of AI.

HIGHLIGHTS

The University of Bologna has recently created a new interdepartmental center on AI: the “**Alma Mater Research Center for Human-Centered Artificial Intelligence**”. [Alma Human AI](#) is an interdisciplinary hub that aims at aggregating and boosting the AI-based research activities that are present in many Departments of the University of Bologna, positioning the University of Bologna in AI research, education, innovation and societal impact at an international level, and approaching AI research from different complementary perspectives. Close collaborations have been built both on national and European level with close connections with the European Association of AI – EurAI, the CLAIRE initiative and with the SuperComputing Applications and Innovation (SCAI) department at CINECA. The University of Bologna is also one of the national laboratory AIIIS – Artificial Intelligence and Intelligent systems at CINI - Interuniversity Consortium for Computer Sciences.

European funded projects

The University of Bologna is the project coordinator of H2020 [StairwAI](#) - Ease the Engagement of Low-Tech users to the AI-on-Demand platform through AI (2021-2023) and is project partner of H2020 [AI4EU](#) - A European AI On Demand Platform and Ecosystem (2019-2021), [HumanE-AI-Net](#) - HumanE AI Network (2020-2023), [TAILOR](#) - Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization (2020-2023) and [BonsAPPs](#) - AI-as-a-Service for the Deep Edge (2021-2023). Moreover, the University of Bologna participated in several AI related European projects in different areas (e.g. in H2020 [OPRECOMP](#) and [BISON](#), in FP7 [ePolicy](#), [COLOMBO](#), [DAREED](#) and many others).