

Title

Spatial Multiagent Systems and Aggregate Computing: New Directions for Spatial Computing

Professors

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Abstract

The huge availability of geographical and spatial data, along with the impulse from ubiquitous and pervasive application scenarios, has pushed the boundaries of complex system engineering towards spatial computing. There, space (in any of the many possible acceptations of the term) represents at the same time the physical container of distributed pervasive applications, the source of a huge amount of data, information, and knowledge, and the target of both epistemic and practical actions.

Agents - as the basic abstraction for distributed computing -, rational agents - as the basic units for encapsulating intelligence -, and multi-agent systems (MAS) - as the social abstraction for collective behaviours - represent the most likely candidates for providing an original framework for spatial computing coherently covering conceptual, technical, and methodological issues. Accordingly, in the first part of this course we elaborate on the state-of-the-art of spatial computing, and show how the classical ontological foundation for MAS (agents, societies, and environment) can coherently capture the essential aspects of spatial computing, also providing for original perspectives and research directions in the novel field of "Spatial MAS".

In the second part, we focus on aggregate computing, a computational framework (encompassing models, languages, algorithms and platforms) for programming spatially-embedded and self-adaptive systems by focussing on the collection of devices seen as a single conceptual machine, i.e., at the aggregate level. After a short tutorial, we present recent research results connected to the engineering of resilient large-scale systems.

Location

Room 2.2

School of Engineering

viale del Risorgimento 2

40136 Bologna

Schedule

- 15/2/2017 h 10-13 (Omicini)
- 16/2/2017 h 10-13 (Omicini)
- 17/2/2017 h 11-13, 14-16 (Viroli)

Final Examination

Students of the course will be asked to

- select one topic among the ones discussed in the course that could in any way intersect their own research activity
- survey the existing literature on the topic
- point out potential research directions - in particular those related to their own research activity, if any

in a written report to be submitted to the course's professors, and possibly revised according to their remarks and criticisms. Final acceptance of the written report means that the exam is passed.