

ARCS 2005 Architecture of Computing Systems (ARCS) – System Aspects in Organic and Pervasive Computing (<http://www.teco.edu/arcs05/overview.html>)

Call for Papers

WORKSHOP SELF-ORGANIZATION AND EMERGENCE: ORGANIC COMPUTING IN THE CONTEXT OF ITS NEIGHBORING DISCIPLINES (PHYSICS, CHEMISTRY, ECONOMY ...)

March 17, 2005, Innsbruck

Deadline for submissions: January 17, 2005

Organization and Program Committee

Dietmar Fey, University of Jena

Thomas Martinetz, Universität zu Lübeck

Christian Müller-Schloer, Institute of Systems Engineering, University of Hannover

Hartmut Schmeck, AIFB, University of Karlsruhe

Theo Ungerer, Institute of Computer Science, University of Augsburg

Rolf Würtz, Institut für Neuroinformatik, Ruhr University Bochum

Organic Computing has emerged recently as a challenging vision for future information processing systems. Organic Computing is based on the insight that it won't be long before we are surrounded by large collections of autonomous systems equipped with sensors and actuators to be aware of their environment, to communicate freely, and to organize themselves in order to perform the actions and services that seem to be required. This presence of networks of intelligent systems in our environment opens fascinating application areas but, at the same time, bears the problem of their controllability. Hence, we have to construct these systems - which we increasingly depend on - as robust, safe, flexible, and trustworthy as possible. In particular, a strong orientation of these systems towards human needs as opposed to a pure implementation of the technologically possible seems absolutely central. In order to achieve these goals, our technical systems will have to act more independently, flexibly, and autonomously, i.e. they will have to exhibit life-like properties. We call those systems "organic". Hence, an "Organic Computing System" is a technical system, which adapts dynamically to the current conditions of its environment. It will be self-organizing, self-configuring, self-healing, self-protecting, self-explaining, and context-aware.

The vision of Organic Computing and its fundamental concepts arose independently in different research areas like Neuroscience, Molecular Biology, and Computer Engineering. Self-organizing systems have been studied for quite some time by mathematicians, sociologists, physicists, economists, and computer scientists, but so far almost exclusively based on strongly simplified artificial models. Central aspects of Organic Computing systems have been and will be inspired by an analysis of information processing in biological systems.

It is the objective of this workshop to bring together computer scientists with researchers from neighboring disciplines – like physics, chemistry, economics, biology – to allow them to benefit from their knowledge in the fields of self-organization and emergence.

This is an interdisciplinary workshop. This means that breadth and understandability beyond the own special interest group is highly encouraged.

Invited topics include but are not limited to:

- self-organization and emergent behavior (general)
- complex adaptive systems
- dissipative systems
- self-organization in production and logistics
- self-organization in biological systems
- self-organization in nano structures
- bio-inspired computing
- artificial life
- multi-agent systems and cellular automata
- technical usage and controllability of emergence

Paper Selection and Workshop Format

Authors will be required to submit papers with a maximum of 10 pages until January 17, 2005. Extended abstracts (3 pages) are also welcome. Contributions (pdf format) should address the following topics:

- Characterization of the project(s), main research goals and results, problem areas
- Aspects of technical application and controllability
- Self-organization and emergence as general phenomena: Communalities and differences

Papers will be selected through a peer-review based on contribution to the overall topic, originality, and scientific value. All selected papers will be published in the workshop proceedings (and should be presented at the workshop). To maximize the outcome of the workshop there will be space for extensive discussions in small groups (2-4 people) and a wrap-up phase at the end.

The proposed preliminary timeline for the workshop is:

09:00 - 12:30 Presentations and discussion of the presented papers

13:30 – 15:00 Group discussions with specific questions

15:30 - 17:00 Presentation of group results and discussion of research directions and co-operations

Deadline for submissions: January 17, 2005

Notification of acceptance/rejection: January 28, 2005

Camera-ready paper: February 11, 2005

Please send electronic submissions (in pdf) to:

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