

DFG Priority Program 1183

Organic Computing

program/steering committee:

Christian Müller-Schloer
Hartmut Schmeck (Coordinator)
Theo Ungerer

9th Colloquium

University of Augsburg
Augsburg, September 21/22, 2009

This colloquium:

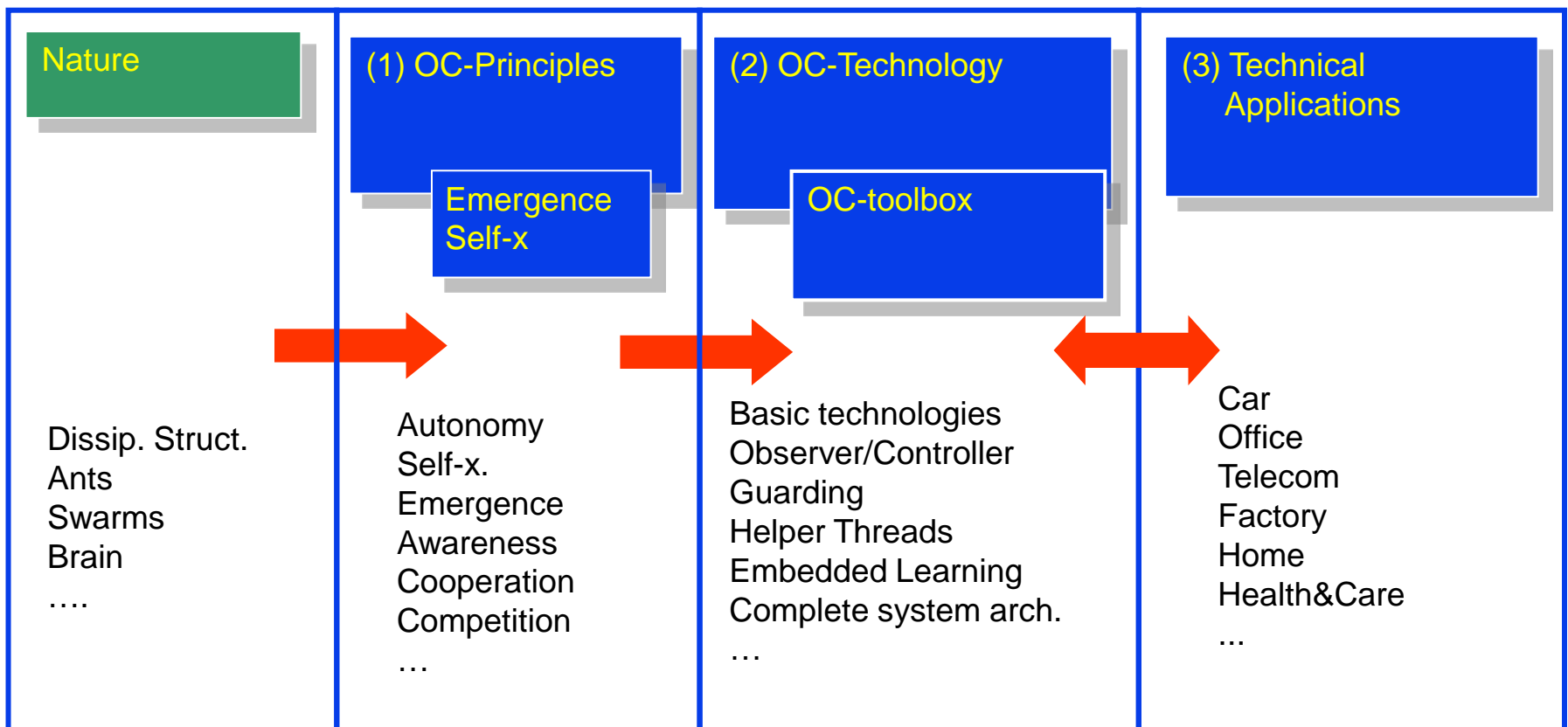
- Special thanks to the local organization Team:
Wolfgang Reif, Benjamin Satzger,
Sebastian Schlingmann, and Theo Ungerer
- Many thanks also to Lei Liu.
- Major topic: **Status of the projects of the priority program**

Brief reminder:

DFG priority program 1183 „Organic Computing“ (2005 – 2011)

www.organic-computing.de/SPP

Program structure and objectives ...



Phase III: 18 Projects

- **Learning to Look at Humans** (Würtz, Uni Bochum)
- **Model-Driven Development of Self-Organizing Control Applications** (Heiß, Mühl, TU Berlin, Weis Uni Duisburg)
- **Organic Fault-Tolerant Control Architecture for Robotic Applications** (Maehle, Brockmann, Uni Lübeck, Großpietsch FhG, St. Augustin)
- **Smart Teams: Local, Distributed Strategies for Self-Organizing Robotic Exploration Teams** (Meyer auf der Heide, Schindelhauer, Uni Paderborn)
- **Formal Modeling, Safety Analysis, and Verification of Organic Computing Applications – SAVE ORCA** (Reif, Uni Augsburg)
- **Embedded Performance Analysis for Organic Computing** (Ernst, TU Braunschweig)
- **OCCS - Observation and Control of Collaborative Systems** (Branke, Schmeck, KIT; Hähner, Müller-Schloer Uni Hannover)
- **OTC² - Organic Traffic Control Collaborative** (Hähner, Müller-Schloer, Uni Hannover, Branke, Schmeck Uni Karlsruhe)
- **AUTONOMOS: A distributed and self-regulating approach for organizing a large system of mobile objects** (Fekete, TU Braunschweig, Fischer, Uni Lübeck)
- **Organic Self-organizing Bus-based Communication Systems** (Teich, Uni Erlangen)
- **Organisation and Control of Self-Organising Systems in Technical Compounds** (Middendorf, Uni Leipzig)
- **Architecture and Design Methodology for Autonomic System on Chip** (Rosenstiel, Uni Tübingen, Herkersdorf, TU München)
- **Multi-Objective Intrinsic Evolution of Embedded Systems (MOVES)** (Platzner, Uni Paderborn)
- **OC μ - Organic Computing Middleware for Ubiquitous Environment** (Ungerer, Uni Augsburg)
- **The bio-chemical information processing metaphor as a programming paradigm for organic computing** (Dittrich, Uni Jena)
- **Energy Aware Self Organized Communication in Complex Networks** (Timmermann, Uni Rostock)
- **Generic emergent computing in chip architectures** (Fey, Uni Erlangen)
- **On-line Fusion of Functional Knowledge within Distributed Sensor Networks** (Sick, Uni Passau)
- **A Modular Approach for Evolving Societies of Learning Autonomous Systems** (Rammig, Kleinjohann, Uni Paderborn))
- **Digital On-Demand Computing Organism for Real-Time Systems** (Becker, Henkel, Karl, Uni Karlsruhe, Brinkschulte, Uni Frankfurt)
- **Emergent radio: Emergent strategies to optimise collaborative transmission schemes** (Beigl, TU Braunschweig, Decker, KIT)

Phase III: joint activities

- Semi-annual colloquia on OC
(usually together with some industrial partner)
 - Status colloquium in September
 - Topical colloquium in February/March
- Working groups and MiniWorkshops on topics of joint interest
 - Architectures and tools
 - Bio-inspired methods
 - Design methods
 - Self-organisation & emergence
 - Applications
 - ...
- Conferences and Workshops (ARCS, BICC, SASO, ATC,...)

Phase III: joint activities

Mailing list spp-oc@lists.uni-karlsruhe.de

- Submissions may be sent to this address
- Subscribe via the link given on the SPP website (internal SPP)

Group server

- Shared documents
- Templates for presentations etc
- Organisational information (guidelines for MiniWorkshops etc)

Repository on OC literature

- Please keep it up to date

Tools (should be extended)

This colloquium:

Organisational remarks:

- **Settlement of travel expenses:**
 - Fill in travel expense forms
 - Attach all relevant tickets and bills (originals, no copies)
 - Send to Institut AIFB – Geb. 05.20, Sekretariat LS1,
Universität Karlsruhe
(use preaddressed envelope)
- **To make your presentation available, copy it onto the memory stick of Lei Liu, please.**
The presentations will be transformed to pdf and then made available on the SPP OC website.

Organizational issues:

- Optional social event at the *Ratskeller Augsburg* this evening (19:30 h)



Ratskeller Augsburg
 Rathausplatz 2
 86150 Augsburg

- How to get there? (by tram)
 - Take the tram 3 from the **University** and get off at the stop “**Königsplatz**”
 - Take the tram 1 from the **Königsplatz** and get off at “**Rathausplatz**”

Organizational issues:

- WLAN Access
 - Access Point SSID: OCSPP
 - Start your browser and use the following login:
 - **Username:** _ocspp
 - **Password:** ocspp209
- Lunch on September 22, 2009
 - Lunch at the Student Cafeteria
 - There will be a dedicated area reserved for the participants of the colloquium
 - Use the food voucher you get at the registration to pay your lunch
 - Contact Lei Liu or Sebastian Schlingmann for any question

Detailed Program:

Monday, September 21, 2009:

13:00 h Opening and Welcome (Wolfgang Reif, Theo Ungerer, Hartmut Schmeck)

13:15 h *Session I*

- **Architecture and design methodology for autonomic system on chip (ASoC)**
(Andreas Herkersdorf, Wolfgang Rosenstiel)
- **The bio-chemical information processing metaphor as a programming paradigm for organic computing II/III** (Peter Dittrich)
- **Multi-objective intrinsic evolution of embedded systems - MOVES** (Marco Platzner)

14:45 h Coffee Break

15:15 h *Session II*

- **Model-driven development of self-organizing control applications**
(Hans-Ulrich Heiß, Gero Mühl, Jan Richling, Arno Wacker, Torben Weis)
- **Organic computing middleware for ubiquitous environments**
(Wolfgang Trumler, Theo Ungerer)
- **Energy aware self organized communication in complex networks** (Dirk Timmermann)
- **Digital on-demand computing organism: stability and robustness**
(Jürgen Becker, Uwe Brinkschulte, Jörg Henkel, Wolfgang Karl)

17:30 h Coffee Break

17:45 h Discussion / Working Groups

19:30 h Social Event: Dinner at Ratskeller Augsburg (self-organized)

Detailed Program

Tuesday, September 22, 2009

08:30 h *Session III*

- **Generic emergent computing in chip architectures** (Dietmar Fey)
- **OCCS – observation and control of collaborative systems**
(Jürgen Branke, Jörg Hähner, Christian Müller-Schloer, Hartmut Schmeck)
- **OTC2 – organic traffic control collaborative**
(Jürgen Branke, Jörg Hähner, Christian Müller-Schloer, Hartmut Schmeck)

10:00 h Coffee Break

10:30 h *Session IV*

- **On-line fusion of functional knowledge within distributed sensor networks**
(Bernhard Sick)
- **Organic Self-organizing bus-based communication systems** (Jürgen Teich)
- **Emergent radio: Emergent strategies to optimise collaborative transmission schemes**
(Michael Beigl, Christian Decker)

12:00 h Lunch Break at the Student Cafeteria

Detailed Program

Tuesday, September 22, 2009

13:00 h *Session V*

- Learning to look at humans (Rolf P. Würtz)
- A modular approach for evolving societies of learning autonomous systems (Bernd Kleinjohann, Franz J. Rammig)
- Embedded performance analysis for organic computing (Rolf Ernst)

14:30 h Coffee Break

15:00 h *Session VI*

- Smart teams: local distributed strategies for self-organizing robotic exploration teams (Friedhelm Meyer auf der Heide, Christian Schindelhauer)
- AUTONOMOS: A distributed and self-regulating approach for organizing a large system of mobile objects (Sandor Fekete, Stefan Fischer)
- Organic fault-tolerant control architecture for robotic applications (Werner Brockmann, Erik Maehle)
- Formal modeling, safety analysis, and verification of organic computing applications - SAVE ORCA (Wolfgang Reif)

17:00 h Concluding Remarks

Today's Program:

13:00 h Opening and Welcome (Wolfgang Reif, Theo Ungerer, Hartmut Schmeck)

13:15 h *Session I*

- Architecture and design methodology for autonomic system on chip (ASoC) (Andreas Herkersdorf, Wolfgang Rosenstiel)
- The bio-chemical information processing metaphor as a programming paradigm for organic computing II/III (Peter Dittrich)
- Multi-objective intrinsic evolution of embedded systems - MOVES (Marco Platzner)

14:45 h Coffee Break

15:15 h *Session II*

- Model-driven development of self-organizing control applications (Hans-Ulrich Heiß, Gero Mühl, Jan Richling, Arno Wacker, Torben Weis)
- Organic computing middleware for ubiquitous environments (Wolfgang Trumler, Theo Ungerer)
- Energy aware self organized communication in complex networks (Dirk Timmermann)
- Digital on-demand computing organism: stability and robustness (Jürgen Becker, Uwe Brinkschulte, Jörg Henkel, Wolfgang Karl)

17:30 h Coffee Break

17:45 h *Discussion / Working Groups*

19:30 h *Social Event: Dinner at Ratskeller Augsburg*

Results of Discussion

- Working Groups / Cross-section topics
 - Architectures and tools **Ungerer**
 - Design methods **Heiß**
 - Applications **Reif**
 - Demonstrators, testlab **Müller-Schloer/Schmeck**
 - Theory **Dittrich**
- MiniWorkshops on these topics

Results of Discussion

- Planning the final event for the priority program SPP 1183 Organic Computing in 2011
 - Possibility to combine the event with a conference?
 - Potential conferences
 - ATC → Schmeck
 - ECCS → Dittrich
 - SSCI → Würtz
 - ICAC → Rosenstiel

- The time after the priority program
 - Follow-up research projects related to Organic Computing?
 - EU-Projects ????

Final remarks

- Thanks again to all of you for active contributions in talks and discussions.
- Thanks again to the groups of Theo Ungerer and Wolfgang Reif for the perfect environment for this colloquium!
- Possible dates for next colloquium (intended to be at Hannover or Wolfsburg)
 - 18./19.2.2010 (before ARCS)
 - 25./26.2.2010 (Thursday/Friday of/after ARCS)
 - 4./5.3.2010 (a week after ARCS)
- Have a good trip back.