

ISSUE 4  
September 2009

# PerAda

newsletter

ALLOW  
FRONTS  
REFLECT  
SOCIALNETS

**SYMBRION**

ATRACO

**ALLOW** - Adaptable Pervasive Flows: [www.allow-project.eu](http://www.allow-project.eu)

**ATRACO** - Adaptive and Trusted Ambient Ecologies: [www.uni-ulm.de/in/atrac](http://www.uni-ulm.de/in/atrac)

**FRONTS** - Foundations of Adaptive Networked Societies of Tiny Artefacts: [fronts.cti.gr](http://fronts.cti.gr)

**REFLECT** - Responsive Flexible Collaborating Ambient: [reflect.pst.ifl.lmu.de](http://reflect.pst.ifl.lmu.de)

**SOCIALNETS** - Social Networking for Pervasive Adaptation: [www.social-nets.eu](http://www.social-nets.eu)

**SYMBRION** - Symbiotic Evolutionary Robot Organisms: [www.symbion.eu](http://www.symbion.eu)

[www.perada.eu](http://www.perada.eu)

## Welcome to Issue 4 of the PerAda Newsletter

In issue 4 we're promoting our Collaborative Research Funding - an exciting and cost-effective way for researchers from academia and industry to forge new alliances and share ideas. Read what some recent research collaborators are saying on the opposite page.

This issue also features what participants thought about the PerAda Summer School, and the PerAda Projects Workshop. Some 'key knowledge gaps' in Pervasive Adaptation research were identified and we shall continue to run more PerAda workshops over the coming year.

We also draw attention to the 'PerAda Research Book' currently being developed by Alois Ferscha and Michael Matscheko at Institute for Pervasive Computing in Linz. Contributing to the book helps identify useful research developments, providing an online roadmap for Pervasive Adaptation.

Lastly, there have been many updates to the PerAda website: new sections, lots of tutorials and talks to download and we even have a new PerAda Summer School Facebook site! On the backpage you'll find details of Future Events and Calls.

Brought to you by the PerAda team:



Callum Egan  
Multimedia Producer

Ben Paechter  
Coordinator

Despina Davoudani  
Administrator

Emma Hart  
Deputy Coordinator

Jennifer Willies  
Project Manager

# PerAda Funding for Collaborative Research

Are you a researcher looking to visit another institution?

Is experience of R & D in industry important to you?

Would you like to invite a researcher from another institution to work with you?

## PerAda can help you do this!

We can fund up to 50% of travel and/or accommodation costs to institutions or companies engaged in research related to Pervasive Adaptation.

### Why are we doing this?

To encourage the **flow of knowledge** and ideas by:

- **encouraging** interdisciplinary research
- **enabling** visits to educational institutions
- **supporting** visits to companies
- **fostering** exchanges between two institutions
- **coordinating** exchanges between industry & academia

### What do YOU need to do?

Get started by visiting the 'Funding' page on our website:

[www.perada.eu/perada-exchange-funding](http://www.perada.eu/perada-exchange-funding)

Don't miss out  
on a wonderful  
opportunity  
to broaden  
YOUR research  
experience!

# PERADA EXCHANGE FUNDING REPORTS

## Research Student Visit to Educational Institution

Andrea Bravi is a MSc student from the Italian Institution Scuola Superiore Sant'Anna who visited the Institute of Parallel and Distributed Systems in the University of Stuttgart for six weeks in May 2009. During his stay in the University of Stuttgart, Florian Schlachter was his tutor.

Andrea Bravi is also a biomedical engineer working as a researcher for the European project REPLICATOR. He is interested in the concept of spatial awareness in the field of multi-robotic systems. In particular, his research involves exploring ways to create control and support functions to handle the disposition within the organism.

The PerAda Research Funding Initiative gave him the opportunity to visit a research team of diverse disciplines, and discuss his ideas on self-organisation with expert researchers of diverse backgrounds that have distinct approaches: "the physicists from [the point of view of] dynamical systems, the computer scientists from evolutionary approaches and other soft computing methodologies, the electronics engineers from system theory."

Going through this experience helped him refine his motivation and ambition for the project, and start a close relationship with the researchers from the University of Stuttgart that is continuing and is leading to writing a paper together.



## International Visit from American researcher to the UK

Brian Goldiez, the Deputy Director at the University of Central Florida's (UCF) Institute for Simulation and Training, visited the research team coordinating the SOCIALNETS project at the Cardiff University UK in 2008.

The focus of the UCF research team is on the human interactions in virtual environments such as multi-user game playing, that involves exploring the structure of relationships between the humans and the environment, which, in turn, is closely linked with the mission of the SOCIALNETS, that is the use of social structures as an adaptive basis for content provision.

From the perspective of the SOCIALNETS, Roger Whitaker, coordinator of the SOCIALNETS project, points out that Dr Goldiez's research provides an innovative application, mixing physical and virtual environments with the distribution of electronic artefacts, where new and important problems are arising relevant to future high-adventure research.

Dr Goldiez and Dr Whitaker identified mutually beneficial crossover in their respective research, and proposed a meeting to gain a deeper understanding of each other's work. The short visit, which was arranged with the contribution of the PerAda Research Funding Initiative, enabled the two parties to obtain concrete ideas for collaboration by realising that they are interested in the same problem only coming from different approaches: the UCF from a computational implementation point of view while the SOCIALNETS using societal structures.



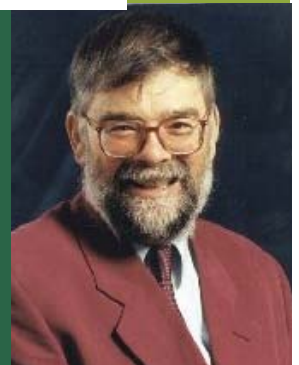
***"PerAda funding made this exchange possible. It would not have occurred otherwise due to limited project funding for international efforts."*** - Brian Goldiez

## Exchange between Academia and Industry

Edinburgh Napier University UK and NXP, a semiconductors company situated in the Netherlands, have initiated a research collaboration in the fields of evolve-able and adaptive pervasive systems, and networked societies of artefacts. In particular, they investigate the use of pervasive systems in the application areas of Personal Spaces, including mobility, Smart Indoor Spaces and Smart Cities. The partnership is jointly funding a research student working in this area.

Professor Jon Kerridge, from the School of Computing, explains "The research builds upon the creation, at Edinburgh Napier, of a highly parallel computing architecture that enables mobility of both computing processes and also of communications channels", while "NXP is seeking to create adaptive systems and produce underlying technological solutions, in the form of silicon products that rely on a software solution that is novel and still being researched at Edinburgh Napier."

To set forth scientific discussions, the two partners arranged short visits to each other in which they agreed on a technical plan for the project, and examined likely target conferences for forthcoming publications.



***"PerAda funding meant that a crucial meeting could take place. The only other way in which these interactions could have taken place would have been by conference call and this is never as effective at such an early stage of a project."*** - Jon Kerridge

# PERADA SUMMER



*"The worst thing about the PerAda Summer School is that it comes to an end."*  
Marios Karagiannis, University of Geneva, Switzerland



*"The summer school was very different from other conferences as it gave me enough time to discuss my own research work and ideas with many people including senior researchers working in my own area."*  
Riaz Ul Amin, University of Glasgow, UK



*"A highly diverse group (lots of different home countries), which lead to interesting discussions and long evenings. I got a much better view on what's going on at other universities and departments, and what PhD students are doing there."*  
Michael Matscheko, Institute for Pervasive Computing, Austria



*"PerAda Summer School has provided us a great opportunity to interact with each other and also provided valuable information about international research collaboration such as researchers exchange program and funding, that I think is a good chance for us to visit each other and to get familiar with the latest research and opportunities in Pervasive Adaptation."*  
Muhammad Imran, University of Glasgow, UK

# PER SCHOOL 2009

## Knowledge gaps & common research challenges which arose from discussions during the PerAda Summer School & Workshop 2009

With respect to the development of adaptive systems for enabling a particular aspect of the user's life (Part 1):

How do we retain controllability in a system and still have pro-actively adaptive systems?

Adaptation within a system may occur either: (1) transparently to the user or (2) by keeping the user aware of the adaptation processes. The challenge is to find the trade-off between minimal user distraction and allowing the user to have control over the system.

In the event of failure within an adaptive system, how to represent the necessary details to the user in order to enable him/her to make a decision?

Another important challenge is the development of coordination mechanisms to resolve situations when multiple processes attempt to take action, simultaneously, within an adaptive system.

With regard to the development of intelligent environments to accommodate adaptive systems:

How do the capabilities of the individual artefacts affect the overall performance of the adaptive system?

How does heterogeneity, in terms of both the hardware and the role assigned to the devices, affect the system capabilities?

How do imprecise measurements affect the performance of the adaptive system?

A major challenge relates to the scaling of the intelligent environments and the adaptive ambient systems. In particular, how to deal with the following factors:

- multiple users and activity spheres
- great amounts of data and meta-data
- uncertainty caused by dynamic context

(Part 2)

With Human – Computer Co-evolution, instead of creating generic applications for any number of users, the adaptive system evolves to fit a single user.

- How does the system monitor the user's state to fine-tune its own adaptive response?
- How does the system revise and evolve the representation of the user and the user's preferences to make sure that they are current?

From the other end, when measuring physiology to deduce a psychological event, personal and private data are accessed by using automation – not a popular approach as people feel disenfranchised and not having control. Ethical issues that appear are:

- How much autonomy is the user willing to give up to the pervasive computer system?
- How does the user learn to 'trust' the system over sustained exposure?
- How much data will people allow the system to take? Who gets access to that data afterwards?



With respect to developing self-organising systems and measuring their performance in terms of how adaptive they are:

What metrics to define for quantifying the adaptive and emergent behaviour of self-organising systems?

What metrics are required for validating an adaptive system, and for comparing two adaptive systems?

Should any such adaptation metrics be domain specific or can adaptation be defined independently of the nature of the system?

### Call for PerAda Workshops:

PerAda is keen to run a range of workshops or conference sessions aimed specifically at increasing collaboration in the research areas covered by Pervasive Adaptation. If you would like to organise such an event at a major conference, PerAda can help provide support, for example, helping to publicise the event, paying the travel costs for an invited speaker, making a contribution towards the publication of accepted papers. You would be responsible for submitting the proposal initially to the conference organisers, but if accepted, PerAda could step in to assist making it a viable event. If interested, please contact the PerAda Project Manager: Jennifer Willies (j.willies@napier.ac.uk)

# PerAda Research Agenda Book

PerAda consortium member Alois Ferscha, Director of the Institute for Pervasive Computing, Johannes Kepler University, Linz invites leading scientists, heads of industry and PerAda experts to contribute to the PANORAMA Research Agenda Book. Initially organised as an online roadmap inviting contributions from the PerAda community, the completed book will also be published in printed format.

The PANORAMA Research Agenda is a book with a comprehensive collection of short articles discussing the latest ideas in Pervasive Adaptation. The goal of the Research Agenda is to provide a systematic ordering of terms and a more standard and agreed explanation of the various research fields.

The Pervasive Adaptation community can work together towards common goals, so that research is: **integrated, coordinated and informed.**

With this in mind the objectives for the PANORAMA Research Agenda Book are as follows:

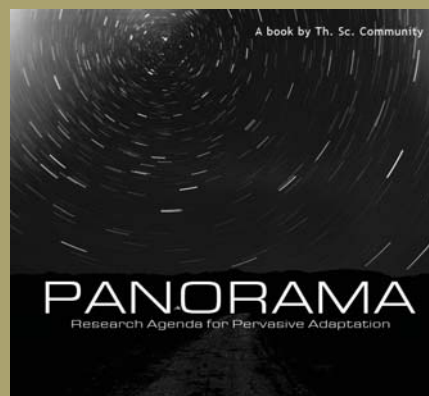
- Identify and address basic research problems and strategic research fields emerging from the evolution of a globalising Information and Knowledge Society.
- Bring together the most important scientific leaders across the proactive initiative to reach a consensus on three and ten year research agendas spanning the wide range of disciplines.
- Identify strengths, weaknesses, opportunities, synergies and complementarities of thematic research areas and involved research institutions capable of performing excellent research.
- Deliver solid and evidence-grounded recommendations to decision-making units and policy makers.

We've set up an online submission and publishing environment for you to easily contribute, engage with and comment on the challenges we face.

To view, contribute or comment please go here:  
[www.perada.eu/research-agenda](http://www.perada.eu/research-agenda)

*"The process of structuring a Research Agenda with so many different aspects engaged in research challenges...has to be an open one, so we decided to go for evolution of a research agenda in the form of a book...we invite everyone to contribute ...by proposing research challenges, by commenting on them, by interlinking with personal experiences..."*

Alois Ferscha  
Johannes Kepler University  
(Institute for Pervasive Computing)  
Linz, Austria



# WEBSITE UPDATES



## Research Agenda Book

PerAda are developing a Research Agenda Book - your contributions are welcome:  
[www.perada.eu/research-agenda](http://www.perada.eu/research-agenda)

## Share Things

Why not complete our survey, share your PhD or research details and view 'shared things':  
[www.perada.eu/share-things](http://www.perada.eu/share-things)



## PerAda Magazine

There are 24 excellent articles in the PerAda Magazine:  
[www.perada-magazine.eu](http://www.perada-magazine.eu)

## Summer School 09: Talks, Tutorials and Presentations

20 presentations available for download:  
[www.perada.eu/tutorials](http://www.perada.eu/tutorials)

## Mobilware 2009 Presentations

6 presentations from the Workshop on User-centric Pervasive Adaptation:  
[www.perada.eu/perada-activities/18-current-events/37-workshop-user-centric-pervasive-adaptation](http://www.perada.eu/perada-activities/18-current-events/37-workshop-user-centric-pervasive-adaptation)

## AISB 2009 Presentations

5 presentations from the Symposium on Pervasive Adaptation:  
[www.perada.eu/perada-activities/19-archived-events/20-symposium-pervasive-adaptation-aisb-2009](http://www.perada.eu/perada-activities/19-archived-events/20-symposium-pervasive-adaptation-aisb-2009)

## Pervasive Adaptation 'Documents and Bookmarks'

It's not pretty - but it is a listing of over 100 PerAda related documents:  
[www.perada.eu/resources/31-perada-general/74-perada-delicious-tagged-documents](http://www.perada.eu/resources/31-perada-general/74-perada-delicious-tagged-documents)



## New 'Calls for Papers' Section

Publicising CFP's for workshops, conferences, special issues, book chapters etc:  
[www.perada.eu/calls-for-papers](http://www.perada.eu/calls-for-papers)



## New Careers Section

Let us know of any career opportunities and we'll publish them:  
[www.perada.eu/careers](http://www.perada.eu/careers)



## Summer School Photos

Login to the members area to view:  
[www.perada.eu](http://www.perada.eu)



facebook

## PerAda Facebook Site

Thanks to Ahsan Ikram for setting this up - anyone can join:  
[www.facebook.com/home.php#/group.php?gid=120404895298&ref=mf](http://www.facebook.com/home.php#/group.php?gid=120404895298&ref=mf)

If you have ideas about how we can develop the PerAda website - contact Callum Egan, Multimedia Producer for PerAda: [callum.egan@napier](mailto:callum.egan@napier).

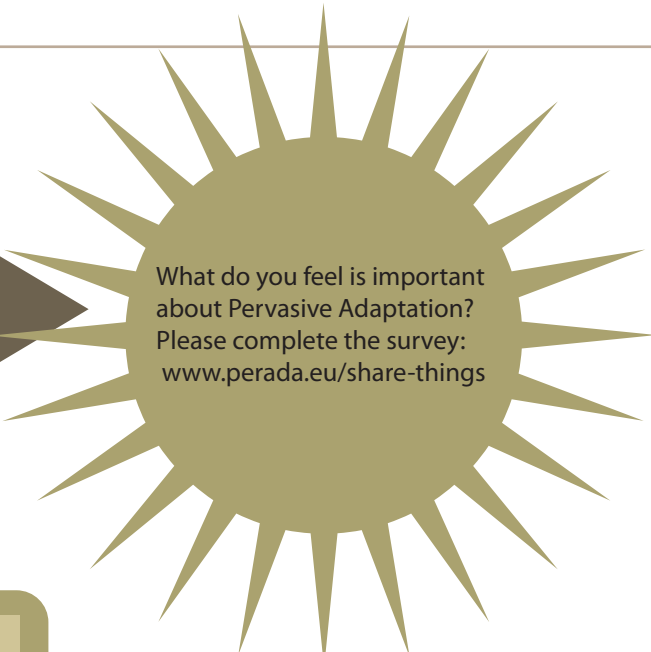
ICT FP7 Call 5 Deadline 26th October 2009

Proactive Initiatives:

Human Computer Confluence (HC-CO)

Self Awareness in Autonomic Systems (AWARENESS)

Towards Zero-Power ICT (2zerop)



What do you feel is important about Pervasive Adaptation? Please complete the survey: [www.perada.eu/share-things](http://www.perada.eu/share-things)

PerAda (Pervasive Adaptation) is a Future and Emerging Technologies Proactive Initiative funded by the European Commission under FP7

AUTONOMICS 2009

September 9 -11 2009

Cyprus University of Technology  
Limassol, Cyprus

SASO 2009

September 14 -18 2009

Third IEEE International Conference on  
Self-Adaptive and Self-Organizing Systems  
San Francisco, USA

FRONTS 2nd Winter School

October 12 - 16 2009

Braunschweig, Germany

AI\*IA 2009

September 12th 2009

Workshop on Complexity, Evolution and  
Emergent Intelligence  
Reggio Emilia, Italy

BIONETICS 2009 - ICST


December 9 -11 2009

Avignon, France

DATE 10

8 - 12 March 2010

Design, Automation & Test Europe  
Dresden, Germany



Check out the Future Events to the left  
More details at:  
[www.perada.eu](http://www.perada.eu)



Jennifer Willies  
PerAda Project Manager  
Edinburgh Napier University  
10 Colinton Road, Edinburgh  
EH10 5DT, UK  
Phone: +44 (0)131 455 2768  
Fax: +44 (0)870 836 2345  
Email: [j.willies@napier.ac.uk](mailto:j.willies@napier.ac.uk)



Edinburgh Napier  
UNIVERSITY

