

PerAda

newsletter

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Towards pervasive adaptation

PerAda is the Coordination Action for the Pervasive Adaptation community, supporting the funded projects under FP7: FET Proactive Initiative on Pervasive Adaptation

www.perada.eu

PerAda Workshop at ICARIS 2010
Pervasive Adaptation in the Health Sector
SASO Workshop & Femto Workshop
3rd PerAda Summer School: Adaptive
Socio-Technical Pervasive Systems

Welcome to Issue 8 of the PerAda Newsletter

Editorial

PerAda proactive initiative draws to a close

Where does the time go? The end of three years of the PerAda proactive initiative is fast approaching, with many projects now busy writing those final deliverables before the projects close around January/February time. Fortunately, PerAda has applied for a four month no-cost extension to enable us to carry on running activities until the middle of next year, so make sure you check out the list of upcoming events inside this edition of the newsletter. It has been yet another busy period; hopefully the photographs in the following pages speak for themselves as to the range and variety of events that have taken place in the past few months – we hope you managed to attend at least one of them! If not, remember that material from most events is available from the PerAda website for download. Please feel free to make use of it, whether for research or teaching purposes.

We have tried to facilitate events which appeal to a wide spectrum of the community; the article on the recent workshop on Pervasive Adaptation in the Health Care sector describes an event targeted directly at industry. The third PerAda summer school, although focused on PhD students and young researchers, also offered an opportunity for more experienced researchers to learn due to the excellent variety of talks covering a broad range of topics; established researchers were able to take the opportunity to present their work at a number of conference workshops, which are highlighted within these pages. The PerAda magazine recently published several new exciting articles, aimed at the informed general public. Whatever your interest in PerAda, we hope that you will find something of use, and we wish all those finalising deliverables a productive couple of months ahead!

PerAda Workshop at SASO

The PerAda team ran a second workshop at the recent IEEE Conference on Self-Organising and Self-Adaptive Systems, SASO, in Budapest, following up a previous workshop held at SASO 2008. Five papers were accepted for full presentation from nine submissions, although unfortunately one author had to withdraw before the conference. In addition to the speaker presentations, the titles of which are given below, the workshop was delighted to welcome an invited speaker, Dr Jeremy Pitt from Imperial College London, who spoke on the subject of Pervasive Adaptation in Affective Workplace Design. The talk presented a generic socially-intelligent ICT system for enhanced Quality of Experience (QoE) in workplace environments using affective, adaptive and pervasive computing. The work was motivated by the prevalence of incivility in open plan office environments, and the observation that rules are often best made by those whose behaviour is regulated by them. The proposed system detects

norm violations through pervasive and affective sensors, and attempts to ameliorate the impact of unintentional norm violation through forgiveness and other interface cues of affective state (e.g. avatars). By resolving conflict through mediation, the ultimate goal of the work is to increase social connectedness and a sense of belonging, thus contributing to an overall increase in QoE.

Paper presentations:

- Driver drowsiness identification by means of passive techniques for eye detection and tracking. *Cristiani, M. Porta, D. Gandini, G.M. Bertolotti and N. Serbedzija*
- Self-adaptive mutation in on-line, on-board evolutionary robotics. *A.E. Eiben, G. Karafotias and E. Haasdijk*
- Self-adaptive Prototype for Seat Adaption. *G.M. Bertolotti, A.Cristiani, R.Lombardi, M.Ribaric, N. Tomasevic, M. Stanojevic*
- Adaptive Task Support Based on Dynamic Human State Estimation. *Stuiver, B.Mulder, K. Brookhuis, D. de Waard and C. Dijksterhuis.*

PerAda workshop

ICARIS 2010

In July 2010, PerAda ran a full day workshop at the 9th International Conference on Artificial Immune Systems – ICARIS 2010, focussing on the application of biologically inspired computing to addressing adaptation issues in PerAda systems. Participants were invited to submit two-page position statements, outlining their perspective on a particular challenge in the domain. Nine papers were accepted, covering a broad spectrum of biological inspiration, including artificial biochemistries, the immune system, fungal colonies and mirror neurons, provoking stimulating debate after each one. Dr Serge Kernbach from the University of Stuttgart, and leader of the Symbion project, gave a plenary talk at the workshop on the fascinating subject of multi-cellular self-Adaptation and self-Development in collective adaptive systems, giving listeners an excellent overview of the area, with plenty of examples and highlighting promising directions in research which targets long-term autonomy and sustainability within real environments.



The position papers are published in the conference proceedings by Springer LNCS (vol 6209) – DOI: 10.1007/978-3-642-14547-6.



3rd PerAda Summer School

Adaptive Socio-Technical Pervasive Systems

A contingent of students and researchers interested in Pervasive Adaptation enjoyed a very successful summer school in Budapest in September, the third one run by PerAda during the lifetime of the project. Recognising the important role that complex and social systems can play in the development of PerAda systems, PerAda joined forces with the ASSYST (www.assyst.open.ac.uk) project to run the school, reaching out to wide range of interdisciplinary researchers. Fifteen students from nine different countries and thirteen speakers enjoyed a week in the beautiful surroundings of Budapest, where they split their time working on mini-projects in small groups, and listening to a broad range of lectures. Talks on a broad range of academic topics were complemented by two talks from leading industrialists, and the European perspective widened by the inclusion of a speaker from the U.S. Due to the co-location of the summer school with the EEE Conference on Self-Adaptive and Self-Organizing Systems (SASO 2010), the students were able to round off their busy week by attending the tutorial and workshop sessions of the conference, at no extra charge.



Many thanks to Franco Zambonelli for his extensive efforts in organising the summer school, to Jeff Johnson from the ASSYST project for his assistance, and to the invaluable help from local organiser Dr. Borbala Katalin Benko from the Technical University of Budapest. A detailed programme, and all the slides from the talks at the school can be found at the PerAda website as usual. www.perada.eu/summer-school-10



Pervasive Adaptation in the Health Sector

Sensor equipped wheelchairs which aid people with motor disabilities, contact lenses which adapt by measuring voltage in the eyes, intelligent forks which analyse our nutritional needs... the medical sector is now exploring new uses for developing technology based on the revolution in designing intelligent, communicating objects which are able to sense, adapt, anticipate, reconfigure, self-protect and self-heal. At the hospital, at home, in our travels, these new objects promise to provide both assistance and therapy in all aspects of life in the not too distant future.

With this in mind, thirty international speakers, drawn from doctors, industrialists, engineers, researchers, users and government were invited to present their views, their innovations and their vision of the future at a workshop and round-table discussion event organised in Paris on 19th October by the PerAda team of Philippe Laurier, Sylvie Vignes and Michel Riguidel. Although the date of the event unfortunately coincided with the height of the recent unrest in Paris due

to striking public sector workers, preventing a proportion of the 300 registrants reaching the event, the day was still hugely successful. Topics addressed included remote diagnostics, motor disabilities, hearing & visual disabilities and remote monitoring of patients outside the hospital environment. A discussion on 'Utilising information technologies within a hospital environment: opportunities and dangers' provided stimulating debate.

The team are planning another industrial event addressing "Smart transport in smart cities" – see the PerAda website for more details: www.perada.eu



Femto Workshop

PerAda sponsored a keynote speaker, Tansu Alcam, Assistant Professor at the Technical University, Berlin at the recent Femto Cell workshop, held in Istanbul as part of the 21st Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications. Tansu is currently assistant professor in Technical University Berlin where he leads the Autonomous Security (aSec) group. He is also affiliated with Deutsche Telekom Laboratories (T-labs) in Berlin, Germany. His research involves applications of distributed decision making, game theory, and control to various security and resource allocation problems in complex and networked systems. His keynote speech examined "Game Theory and Wireless Networks", in which he presented an overview of current approaches, and discussed game theory's future potential in networking research. Game theory can potentially be a very useful tool for researchers working in the area of Pervasive Adaptation. Its advantages include comprehensive mathematical modelling capabilities, providing methods for automatic decision making for security, enabling optimal and robust allocation of network resources, and



a route to the development of a decision and control framework for making resource allocation decisions in a principled manner. As well as discussing the current state-of-the-art, Tansu's talk highlighted many areas for promising future research, including investigating novel methods for incorporating robustness further into game theoretic models, developing mechanisms resistant to adversarial behaviour and in modelling social aspects in problems such as privacy and trust.

Further details on Tansu's research, including links to his publications, can be found at www.tansu.alpcan.org.



PerAda-sponsored invited speaker @
Femto Cell Workshop: Sunday 26 Sept 2010: 09:00 – 17:30
21st Annual IEEE International Symposium on Personal, Indoor and
Mobile Radio Communications *Istanbul* PIMRC
26 - 29 September 2010

PerAda Events coming up

MobiQuitous

2nd PerAda workshop on User-centric Pervasive Adaptive Systems to be held at MobiQuitous 2010: December 6-9th, Sydney, Australia. Nikola Serbedzija, Martin Wirsing and Alois Ferscha will host a second workshop at the 7th International ICST Conference on Mobile and Ubiquitous Systems, addressing inter-disciplinary methods for achieving empathic user-centric pervasive adaptation. See <http://www.mobiquitous.org/workshops/index.html> for further details.

Events in 2011

PerAda is planning several public outreach events for 2011 including:

Participation in the **Foire De Lyon**; a major international trade fair www.foiredelyon.com.

An interactive exhibition and discussion event at the **Edinburgh International Science Festival** www.sciencefestival.co.uk.

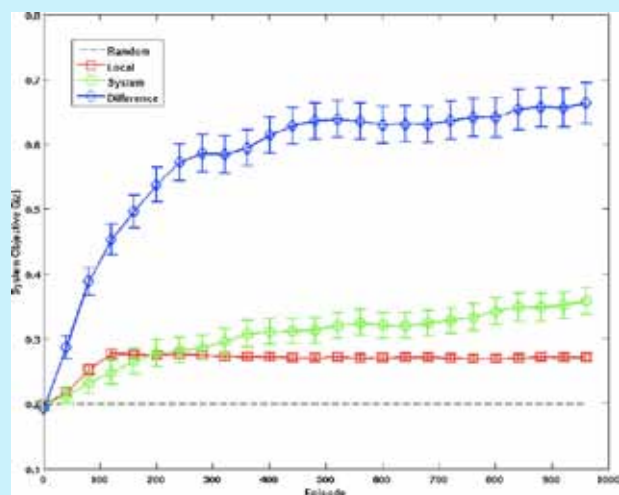


A multiformat dialogue event at the **Science Museum in London** www.sciencemuseum.org.uk.

All of these events will promote the work of the PerAda projects to a general audience in an engaging and exciting manner. They are also being designed to elicit public opinions on the potential impacts of pervasive and adaptive technologies. Watch out for more details on the PerAda website.

PerAda magazine

Check out the latest articles in the PerAda magazine which has published nine new articles since July, covering Autonomous Systems, Software, Affective Computing, Agents and Devices. The latest article by Kagan Tumer and Matt Knudson describes a general approach to coordinating learning agents and present examples from the multi-robot-coordination domain, in which they show how providing agents with difference objectives can lead to coordinated behaviour. Their method has applications in numerous domains, including autonomous robot exploration (e.g search and rescue), distributed sensor networks, and traffic



management, i.e. any system in which many agents are tasked with coordinating to achieve a system level goal.

Read online or download:

www.perada-magazine.eu

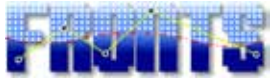
PerAda Projects



ALLOW
Adaptable Pervasive Flows
www.allow-project.eu



ATRACO
Adaptive and Trusted Ambient Ecologies
www.uni-ulm.de/in/atracoco



FRONTS
Foundations of Adaptive Networked Societies of Tiny Artefacts
fronts.cti.gr



REFLECT
Responsive Flexible Collaborating Ambient
reflect.pst.ifi.lmu.de



SOCIALNETS
Social Networking for Pervasive Adaptation
www.social-nets.eu



SYMBRION
Symbiotic Evolutionary Robot Organisms
www.symbrion.eu



About PerAda

The FET Proactive Initiative on Pervasive Adaptation targets technologies and design paradigms for pervasive information and communication systems, which are capable of autonomously adapting in dynamic environments. The adaptation of individual components will lead to adaptation of the system as a whole and to the emergence of new system behaviours which will be self-configuring, self-healing, self-optimizing and self-protecting. The prospect of building adapting pervasive systems brings many new trust and security challenges to the complex interactions between people, intelligent devices and computers and will need to take account of the non-deterministic and often non-predictable behaviour of people.



The PerAda team at Edinburgh Napier University

PerAda is the Pervasive Adaptation Research Network, coordinated by Edinburgh Napier University, Edinburgh, Scotland - which aims to bring researchers together to discuss and share ideas relevant to Pervasive Adaptation. By joining the discussion, PerAda members gain access to a comprehensive research network to share ideas and resources.

www.perada.eu