

Network Action Proposal

Title:	Dynamic Field Theory: Applications in Cognitive Science and Robotics
Membership number(s)	57, 69
Member name(s)	Wolfram Erlhagen, Estela Bicho
Member institute/company name(s)	University of Minho, Portugal
Goals of the action	<p>The main goal of the thematic workshop is to promote the exchange of ideas between researchers from different disciplines who are using (or want to use) Dynamic Fields as a theoretical framework for solving problems in Cognitive Science, Neuroscience and Robotics. DFs have been originally introduced as a mathematical model for explaining pattern formation in neural tissue. In the past couple of years, the DF framework has been extended to develop neuro-plausible models for a large variety of topics in Cognitive Science. Example areas are among others development and learning, action planning, goal understanding, motion perception, working memory, or decision making. Robotics is another research area which has contributed in the past to the development of the Dynamic Field Theory. DF models have been used as a part of the control architecture to endow autonomous robots with some cognitive skills. Interestingly, more than 30 years after the seminal work by Wilson, Cowan and Amari there is also a renewed interest by part of the mathematics community in understanding more rigorously the formation of patterns in different DF models. Theoretical advances are important to overcome some of the heuristics and shortcomings in currently used DF models.</p> <p>The workshop brings together experts who have made in the past important contributions on a more theoretical and conceptual level and/or in the application domain. The list of confirmed invited speakers include (not yet complete):</p> <ul style="list-style-type: none"> • Steven Coombes, University of Nottingham, UK • Si Wu, University of Sussex, UK (on the move to China) • Phillipe Gaussier, University of Cergy-Pointoise, France • Gregor Schöner, Ruhr-University Bochum, Germany • John Wyller, Norwegian University of Life Sciences, Norway • Nicolas Rougier INRIA Lorraine, France • Estela Bicho, University of Minho, Portugal • William Troy, University of Pittsburgh, USA
Principal activity to which it contributes	<p>The workshop will mainly contribute to the Scientific Outlook of <i>euCognition</i>. We expect that the cross-fertilization between different applications in cognitive (neuro-) science, between robotics and cognitive modelling, and between mathematical foundations and applications will help to further establish DFT as a theoretical framework for cognitive science. This includes a discussion of communalities and differences with other theoretical approaches like connectionist or probabilistic</p>

	models. The broad range of applications may attract <i>euCognition</i> members and other researcher who are yet not familiar with the DFT approach. The workshop may thus also contribute to the Community Outreach and Training.								
Concrete outcomes of the action (at least one of which should be material suitable for publication on the euCognition website)	The workshop will provide a comprehensive overview about recent advances in Dynamic Field Theory and its application in Robotics and Cognitive Science. As concrete contributions to the <i>euCognition</i> website we promise <ol style="list-style-type: none"> 1) an up-to-date description for the Cognition-Wiki, 2) to make the abstracts of the talks available for the general public (e.g., through the workshop webpage). We will also ask the speakers for their permission to include their presentations. 								
Effort in person-days that will be charged to the Network Action (if any)	No labour costs will be charged.								
Expected start and duration in months	8.-9. September 2008, 2-day workshop								
The requested funding, under the following headings: <ul style="list-style-type: none"> o Travel Costs o Other Costs (check with the Network Coordinator if you aren't sure about eligibility of these costs) o Labour Costs (identify the number of person-days and the rate per day). 	<p>The requested funding from <i>euCognition</i> is 3000 Euro. It is planned to cover with this contribution of the network the travel costs of 3 invited speakers. Since the budget we can get from the Portuguese Science Foundation (FCT) for "travel expenses" is limited, the contribution is important to guarantee a sufficiently large number of invited experts who cover the variety of applications of DFT that already exist.</p> <p>Three invited speakers from Europe:</p> <table border="0"> <tr> <td>Travel Cost (depending on ticket cost) :</td> <td>550 (per person)</td> </tr> <tr> <td>Subsistence:</td> <td>3*100 (per person)</td> </tr> <tr> <td>Conference fee:</td> <td>150 (per person)</td> </tr> <tr> <td>Total:</td> <td>3000 Euro</td> </tr> </table>	Travel Cost (depending on ticket cost) :	550 (per person)	Subsistence:	3*100 (per person)	Conference fee:	150 (per person)	Total:	3000 Euro
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Please identify any other sources of funding that contribute to this Action (actions to support events such as workshop and conferences should include an outline budget identifying the total cost)	The expense of the other invited speakers (at least 5 more, 2 are not from Europe, one is from the University of Minho) to the workshop are covered by money from the Portuguese Science Foundation and the University of Minho (estimated costs: ~6500 Euro). The workshop will be part of a conference on "Dynamical Systems and Applications" which will take place at the University of Minho (UM), September 8-12, 2008. The conference fees cover all additional workshop expenses (conference hall, catering, social event), they must be paid also for invited speakers.								
Workshops: <i>official euCognition event</i> (yes/no & maximum number of members that can be accommodated)	Yes, we are very interested to attract PhD students, postdocs and researchers who want to learn about the Dynamic Field Theory. A maximum of 15 members can be accommodated. There are still a few slots free for additional talks.								