

Network Action Proposal

Title:	Visit Dr. Yakov Kazanovich to the Centre for Theoretical and Computational Neuroscience, University of Plymouth
Membership number(s)	
Member name(s)	Prof. Roman Borisyuk in collaboration with Prof. Angelo Cangelosi
Member institute/company name(s)	University of Plymouth
Goals of the action	<p>- To enable 3-month research visit of Dr. Yakov Kazanovich (Institute of Mathematical Problems in Biology (IMPB) of the Russian Academy of Sciences, Puschino, Russia) to Prof. Roman Borisyuk Lab at the University of Plymouth.</p> <p>Dr. Yakov Kazanovich is currently the Head of the Neural Network Lab at the IMPB of the Russian Academy of Sciences. His area of expertise is computational neuroscience and modeling of cognitive functions. During many years there is a fruitful collaboration between Dr. Kazanovich and Professor Borisyuk on the development of neural network models of attention, novelty detection, and memory which mimic data of neurobiological and psychological experiments . These models are based on the powerful principles of neural oscillations and synchronization of neural activity (Borisyuk & Kazanovich, 1994, 1998, 2003, 2004; Kazanovich & Borisyuk, 2003, 20006).</p> <p>The current project will move previous developments closer to the applications in simulated cognitive systems and robotics. It will be developed in close collaboration and daily meetings and discussions between Dr. Kazanovich and Prof. Borisyuk. New synchronization based models for segmentation of visual scene and object selection will be developed. These models will combine state-of-the-art algorithms for selective visual attention and segmentation. In fact, a preliminary study with artificially generated images shows that a new approach is very efficient. Further development of the models will include a new sub-module for automatic adjustment of model parameters which will provide the best fitting of the model to the images. For testing the model, massive computational experiments will be run with both artificially generated and real images from still camera. These simulations of visual scenes (especially scenes with real images) require a significant computational power. The CTCN has a cluster of 80 processors which will be used for these simulations. The results of model development and simulations will be reported in a paper which will be submitted to an international journal. Also, a new segmentation algorithm for robot application will be developed (in collaboration with Prof. Cangelosi).</p>
Principal activity to which it contributes <ul style="list-style-type: none"> ○ Community Outreach 	Community Outreach: <ul style="list-style-type: none"> - Exchange visit

Concrete outcomes of the action	<p>The results of Dr. Kazanovich visit to the University of Plymouth will be:</p> <ul style="list-style-type: none"> - to continue the development and simulations of the segmentation model using the computer cluster of CTCN, - to prepare state-of-the-art-survey/position paper(s) for the euCognition Wiki on synchronization based neural models of cognitive functions (attention, novelty detection, memory, and segmentation), - to prepare the material for the publication in an international journal of a paper on synchronization based segmentation, - to discuss with Prof. Cangelosi specific details of the robotic implementation algorithm for visual segmentation
Effort in person-days that will be charged to the Network Action (if any)	N/A
Expected start and duration in months	1/9/2008 (3 months)
<p>The requested funding, under the following headings:</p> <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>€ 900 for one return trip Pushchino (Moscow) - Plymouth</p> <p>€ 5400 support for accommodation (subsistence) of Dr. Yakov Kazanovich during his visit to Plymouth (1800 euro per month x 3 months)</p> <p>€ 6300 TOTAL REQUESTED</p> <p>PS. To cover accommodation/renting of an apartment in Plymouth as well as living expenses in the UK we request 1800 euro per month for the period of 3 months.</p>
Please identify any other sources of funding that contribute to this Action	The University of Plymouth will provide the funding to cover estate expenses related to the use of stationeries, computing facilities, office space, etc.