TAROS 2007: Towards Autonomous Robotic Systems

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EDITORIAL

TAROS 2007: Towards Autonomous Robotic Systems

Guest Editors

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Each paper in this special feature extends the work presented at the TAROS conference (Towards Autonomous Robotic Systems) in September 2007 at Aberystwyth University in the UK. The first paper, by Lenz *et al*, implements a biologically inspired adaptive gaze controller. The second, by Edwards *et al*, takes inspiration from the human skin corpuscular sensors to build an artificial finger for texture discrimination.

TAROS, now in its 10th year, continues as a premier platform for the UK robotics research community to meet, present ideas and discuss all issues concerning robotics. The remit of TAROS is wide, from biologically inspired robotics to kinematics, and participants from all areas are welcome. We were also pleased to invite two internationally renowned speakers to Aberyswtyth for the 2007 conference (Hugh Durrant-Whyte from the University of Sydney, and Jean-Arcady Meyer from the Animat Lab in Paris) and also welcomed many international participants who brought a wider perspective to the proceedings.

Until last year the EPSRC funded network, Biro-Net, supported TAROS to encourage growth and integration of research in the area of biologically inspired robotics. It was with great pleasure that the input from the biologically inspired robotics community allowed a complete session on the subject areas within the TAROS conference in 2007.

The first paper, which won the Institute of Physics prize for the best biologically inspired paper presented at the TAROS conference, is by A Lenz, T Balakrishnan, A G Pipe and Chris Melhuish. This paper presents a hardware implementation of the vestibulo-ocular stabilizing reflex present in many vertebrates. In a biological system, this reflex allows stable vision even during dynamic changes such as disease, growth or fatigue. The authors aim to implement these useful capabilities based on a biologically plausible model on a robotic testbed. The paper begins with a discussion on gaze stabilization and describes in detail the biological basis for the model used on the robotic platform. The paper continues with an introduction to the model used, placing it in context with the previous section. The mechanical testbed is introduced, along with an on-line learning algorithm designed to reduce the perceived visual slip from its gyroscope. The paper presents some experimental results and discusses the performance of the robotic implementation of the vestibulo-ocular reflex.

The second paper, by J Edwards, J Lawry, J Rossiter and C Melhuish, follows suit with a hardware implementation of another human sensor, the touch sense corpuscles under the skin. The aim of the paper is to differentiate between the textures from a variety of different surface types, a useful skill for a robotic sensor. The work is placed in context with reference to other similar sensors, and the biological inspiration is examined. A series of disks were produced with varying surfaces which were run in turn under an artificial finger (all produced using rapid prototyping) to produce a series of vibration recordings. These were then classified using feature analysis which was then compared with principal component analysis.

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