Multi-sensory autonomous cognitive systems interacting with dynamic environments for perceiving and learning affordances

Fact Sheet

Project Information

MACS

Grant agreement ID: 004381

Project website

Start date
1 September 2004

End date
30 November 2007

Funded under
FP6-IST

Overall budget
€ 2 597 113

EU contribution
€ 1 893 994

Coordinated by
FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
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Objective

In Cognitive Science, an affordance is a resource or support that the environment offers an agent for action, which the agent can directly perceive and employ. Only rarely has this concept been used in Robotics and AI, although it offers an original perspective on coupling perception, action and reasoning, differing from standard hybrid robot control architectures.

Perceiving affordances in the environment means perception as filtered through the individual capabilities for physical action and through the current goals or intentions, thereby coupling perception and action deep down in the control and providing an

action-oriented interpretation of percepts in real time. Moreover, affordances provide on a high granularity level a basis for human-robot interaction and for learning or adapting context-dependent, goal-directed action.

The MACS project aims at developing affordance-based control as a new architecture paradigm for embedded cognitive systems. To this end, standard control architectures have to be completely redesigned to employ affordances effectively and efficiently in all modules of an affordance-based system. Accordingly, major lines of work in MACS address in the context of affordance-based control the topics of architecture, perception, representation, and learning. An autonomous mobile robot serves as an integrated demonstrator, which uses vision and 3D geometry sensing (3D laser scanner) as its main sensors and has locomotion and a simple manipulation device (2 DOF arm with a magnetic gripper) as bases for physical action.

In the course of the project, the physical robot demonstrator as well as its simulation will serve as an environment for integrating incremental versions of the software modules under development, providing a permanently available workbench for testing and evaluating versions of the architecture and of its modules.

Programme(s)

Topic(s)

Funding Scheme

STREP - Specific Targeted Research Project

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Last update: 9 April 2008
Record number: 71572

Permalink: https://cordis.europa.eu/project/id/004381/