RoboEarth: robots sharing a knowledge base for world modelling and learning of actions

Fact Sheet

Project Information

RoboEarth

Grant agreement ID: 248942

Closed project

Start date 1 December 2009
End date 30 November 2013

Funded under FP7-ICT

Overall budget € 5 613 559

EU contribution € 3 958 000

Coordinated by TECHNISCHE UNIVERSITEIT EINDHOVEN Netherlands

Project description

Cognitive Systems and Robotics
Connecting robots world-wide

The RoboEarth project exploits a new approach towards endowing robots with advanced perception and action capabilities, thus enabling robots to carrying out useful tasks autonomously in circumstances that were not planned at design time. RoboEarth is a world wide web-style database and will allow robots to share any reusable knowledge independent from their hardware and configuration. As a result of the proposed project, major innovations are expected in the fields of 3D sensing (object recognition and localization), control strategies (linking perception and action)
and learning. Examples of demonstrators are presenting meal options and serving a drink to a patient in a hospital room.

The RoboEarth-project exploits a new approach towards endowing robots with advanced perception and action capabilities, thus enabling robots to carrying out useful tasks autonomously. The core of the innovation involves a world-wide web-style database: RoboEarth. RoboEarth will allow robots to share any reusable knowledge independent from their hardware and configuration. When a robot starts performing a task, it is able to download available high-level knowledge on both task and environment; next, it can use and translate this knowledge to its hardware specifications and its configuration and will improve it by learning during the task. Finally, it will upload its knowledge to RoboEarth again. As a result of the proposed project, major innovations are expected in the fields of: 3D sensing, control strategies and learning. Next to these, RoboEarth will contribute to a more modular design of robotic systems; robot hardware with a hardware abstraction layer for RoboEarth will be enough to build a functional robot. A series of six demonstrators will show the contributions of the project. The Action Recipe demonstrator will show robots creating/uploading and downloading/executing action recipes (abstract behaviour or algorithm descriptions in the RoboEarth database) to and from RoboEarth. The Ask Meal demonstrator will present meal options to a patient in a hospital room. The Serve Drink demonstrator will integrate 3D-sensing in the task by presenting a drink to the patient. The Screw Cap demonstrator will add improvement of the task by learning to remove the screw cap from a bottle. The Family Visit demonstrator focuses on the integration of dynamic object tracking into RoboEarth. Finally, the A Week In The Hospital demonstrator will show that history data from RoboEarth will enable a robot to improve its performance.

The research and technological development the RoboEarth consortium proposes to undertake will pave the way for completely new markets.
Funding Scheme

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