A Robotic Sense of Movement

Fact Sheet

Project Information

RoboSoM
Grant agreement ID: 248366
Project website

Status
Closed project

Funded under
FP7-ICT

Overall budget
€ 2 170 862

EU contribution
€ 1 659 000

Coordinated by
SCUOLA SUPERIORE DI STUDI UNIVERSITARI E DI PERFEZIONAMENTO S ANNA
Italy

Project description

Cognitive Systems and Robotics
New design model based on the human sense of movement
The objective of RoboSoM is to investigate and to apply new approaches to the design and development of humanoid robots with advanced perception and action capabilities, showing robust, adaptive, predictive and effective behaviour in the real world. The expected robot behaviour is the capability to follow a visual target by coordinating eye, head, and leg movements, with head stabilization, walking smoothly and effectively in an unstructured environment, with a robust reactive behaviour, improved by predictions.
The proposal objective is to investigate new approaches to the design and development of humanoid robots with advanced perception and action capabilities, showing robust, adaptive, predictive and effective behaviour in the real world. The proposed new approaches are strongly based on the concept of human sense of movement by Alain Berthoz, a key partner in this proposal. There are two main ideas related to this concept, which are relevant to robotics: 1) the vestibular unified reference frame, as set by the vestibular system in the centre of the head; 2) Expected Perception (EP), or the capability to make predictions of consequences of actions, which is at the basis of the human predictive control. The expected robot behaviour is the capability to follow a visual target by coordinating eye, head, and leg movements, with head stabilization, walking smoothly and effectively in an unstructured environment, with a robust reactive behaviour, improved by predictions. This behaviour is a fundamental, but quite novel, capability for humanoid robots, and it may result in a truly robust and effective behaviour in many helpful tasks in real-world scenarios. The proposed project will use the existing and fully operational biped humanoid robotic platform named Sabian, available at SSSA. It is a copy of the Wabian robot developed at WUT. The legs have functional hip and waist DOF that allow to de-couple the leg and head movements. This unique feature guarantees a truly human-like walking behaviour with head stabilization. IST has developed and has in its lab the same head as the Sabian robot. It is strong belief of proposers that the service robotics markets needs a new generation of robotic systems with a better behaviour in real world, in terms of sensory-motor performance, adaptability, robustness, and that understanding the principles underlying the biological brain sense of movement can lead to the design of robots that represent one important step in this direction.

Field of science

/technology/electrical engineering, electronic engineering, information engineering/electronic engineering/robotics/autonomous robots

Programme(s)

Topic(s)

Call for proposal
FP7-ICT-2009-4

Funding Scheme
Coordinator Contact

Paolo DARIO (Prof.)

Coordinator

**SCUOLA SUPERIORE DI STUDI UNIVERSITARI E DI PERFEZIONAMENTO SANNA**

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<td>€ 618 302</td>
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Paolo Dario (Prof.)

Participants (5)

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<td>Research Organisations</td>
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<td>75794 Paris</td>
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