Cognitive Control Framework for Robotic Systems

Fact Sheet

Project Information

Funded under
FP7-ICT

CORBYS
Grant agreement ID: 270219

Closed project

Overall budget
€ 8 755 265

EU contribution
€ 6 099 252

Coordinated by
UNIVERSITAET BREMEN
Germany

Project description

Cognitive Systems and Robotics

The focus of the CORBYS project is on robotic systems that have symbiotic relationship with humans. These systems have to cope with highly dynamic environments as humans are demanding, curious and often act unpredictably. CORBYS will design and implement a cognitive robot control architecture that allows the integration of 1) high-level cognitive control modules, 2) a semantically-driven self-awareness module, and 3) a cognitive framework for anticipation of, and synergy with, human behaviour. These modules will be supported with an advanced multi-sensor system to facilitate dynamic environment perception. This will enable the
adaptation of robot behaviour to the user’s variable requirements.

CORBYS focus is on robotic systems that have symbiotic relationship with humans. Such robotic systems have to cope with highly dynamic environments as humans are demanding, curious and often act unpredictably. CORBYS will design and implement a cognitive robot control architecture that allows the integration of 1) high-level cognitive control modules, 2) a semantically-driven self-awareness module, and 3) a cognitive framework for anticipation of, and synergy with, human behaviour based on biologically-inspired information-theoretic principles. These modules, supported with an advanced multi-sensor system to facilitate dynamic environment perception, will endow the robotic systems with high-level cognitive capabilities such as situation-awareness, and attention control. This will enable the adaptation of robot behaviour, to the user’s variable requirements, to be directed by cognitively adapted control parameters. CORBYS will provide a flexible and extensible architecture to benefit a wide range of applications; ranging from robotised vehicles and autonomous systems such as robots performing object manipulation tasks in an unstructured environment to systems where robots work in synergy with humans. The latter class of systems will be a special focus of CORBYS innovation as there exist important classes of critical applications where support for humans and robots sharing their cognitive capabilities is a particularly crucial requirement to be met. CORBYS control architecture will be validated within two challenging demonstrators: i) a novel mobile robot-assisted gait rehabilitation system CORBYS; ii) an existing autonomous robotic system. The CORBYS demonstrator to be developed during the project, will be a self-aware system capable of learning and reasoning that enables it to optimally match the requirements of the user at different stages of rehabilitation in a wide range of gait disorders.

Fields of science

Programme(s)

Topic(s)

Call for proposal

FP7-ICT-2009-6
Funding Scheme

Coordinator

UNIVERSITAET BREMEN
- Address: Bibliothekstrasse 1, 28359 Bremen, Germany
- Activity type: Higher or Secondary Education Establishments
- EU contribution: € 1,119,900

Administrative Contact
Axel Gräser (Prof.)

Participants (10)

VRIJE UNIVERSITEIT BRUSSEL
- Belgium
- EU contribution: € 552,871
- Address: Pleinlaan 2, 1050 Brussel
- Activity type: Higher or Secondary Education Establishments

Administrative Contact
Maria Vereeken (Ms.)

SCHUNK GMBH & CO KG SPANN- UND GREIFTECHNIK
- Germany
- EU contribution: € 543,155
- Address: Bahnhofstr 106-134, 74348 Lauffen
- Activity type: Private for-profit entities (excluding Higher or Secondary Education Establishments)

Administrative Contact
Roland Tschakarow (Dr.)
NEUROLOGISCHES REHABILITATIONSZENTRUM FRIEDEHORST GEM GMBH

Germany
EU contribution
€ 118 650
Address
Rotdornallee
28717 Bremen

Contact the organisation
Administrative Contact
Matthias Spranger (Dr.)

OTTO BOCK MOBILITY SOLUTIONS GMBH

Germany
EU contribution
€ 342 532
Address
Lindenstrasse 13
07426 Konigsee

Contact the organisation
Administrative Contact
Tino Löffelholz (Mr.)

OTTOBOCK SE & CO. KGAA

Germany
EU contribution
€ 174 984
Address
Max-nader-strasse 15
37115 Duderstadt

Website
Contact the organisation
Administrative Contact
Olaf Kroll-Orywahl (Mr.)
<table>
<thead>
<tr>
<th>Organisation</th>
<th>Country</th>
<th>EU contribution</th>
<th>Address</th>
<th>Activity type</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIT &amp; BRAIN TECHNOLOGIES SL</td>
<td>Spain</td>
<td>€ 488 808</td>
<td>Paseo Sagasta 19 Entresuelo Derecha</td>
<td>Private for-profit entities (excluding Higher or Secondary Education Establishments)</td>
</tr>
<tr>
<td>STIFTELSN SINTEF</td>
<td>Norway</td>
<td>€ 1 034 937</td>
<td>Strindveien 4 7465 Trondheim</td>
<td>Research Organisations</td>
</tr>
<tr>
<td>UNIVERZITETNI REHABILITACIJSKI INSTITUT REPUBLIKE SLOVENIJE-SOCA</td>
<td>Slovenia</td>
<td>€ 290 255</td>
<td>Linhartova Cesta 51 1000 Ljubljana</td>
<td>Public bodies (excluding Research Organisations and Secondary or Higher Education Establishments)</td>
</tr>
<tr>
<td>The University of Hertfordshire</td>
<td>United Kingdom</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE UNIVERSITY OF READING

Address
College Lane
AL10 9AB Hatfield.
Hertfordshire

Activity type
Higher or Secondary Education Establishments

Website
Contact the organisation

Administrative Contact
Christopher Gibbs (Mr.)