Symbiotic Evolutionary Robot Organisms

Fact Sheet

Project Information

Grant agreement ID: 216342

SYMBRION

Funded under
FP7-ICT

Overall budget
€ 7 452 801

EU contribution
€ 5 798 200

Coordinated by
UNIVERSITY OF STUTTGART

Project description

Pervasive adaptation

The main focus of this project is to investigate and develop novel principles of adaptation and evolution for symbiotic multi-robot organisms based on bio-inspired approaches and modern computing paradigms. Such robot organisms will consist of super-large-scale swarms of robots, which can dock with each other and symbiotically share energy and computational resources within a single artificial-life-form. When it is advantageous to do so, these swarm robots can dynamically aggregate into one or many symbiotic organisms and collectively interact with the
physical world via a variety of sensors and actuators. The bio-inspired evolutionary paradigms combined with robot embodiment and swarm-emergent phenomena, enable the organisms to autonomously manage their own hardware and software organization. In this way, artificial robotic organisms become self-configuring, self-healing, self-optimizing and self-protecting from both hardware and software perspectives. This leads not only to extremely adaptive, evolve-able and scalable robotic systems, but also enables robot organisms to reprogram themselves without human supervision and for new, previously unforeseen, functionality to emerge. In addition, different symbiotic organisms may co-evolve and cooperate with each other and with their environment. The extraordinary potential and capability of autonomous large-scale symbiotic self-aggregation, reprogramming and evolution would open-up a wide range of current and future applications. The main application scenarios of such artificial organisms would be human-free environments with a high degree of danger or uncertainty as e.g. hazardous or space environments. The consortium represents leading organizations in different research fields and provides the critical mass of expertise and resources. The core of consortium is already participating in other robotic projects, as e.g. I-Swarm or MiCRoN thus demonstrating the high level of competence and credibility of this proposal.

Fields of science

Programme(s)

Topic(s)

Call for proposal

FP7-ICT-2007-1

Funding Scheme

Coordinator

UNIVERSITY OF STUTTGART

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<td>Higher or Secondary</td>
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<td>70174 Stuttgart</td>
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Participants (13)

**UNIVERSITAET GRAZ**
- Austria
- EU contribution: € 536 000
  - Address: Universitatsplatz 3, 8010 Graz
  - Activity type: Higher or Secondary Education Establishments
- Website
- Contact the organisation

**UNIVERSITE LIBRE DE BRUXELLES**
- Belgium
- EU contribution: € 454 400
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- Contact the organisation

**VIB VZW**
- Belgium
- EU contribution: € 419 900
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  - Activity type: Research Organisations
- Website
- Contact the organisation
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<td>€ 403 320</td>
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Germany

EU contribution
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Activity type
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Administrative Contact
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STICHTING VU

Netherlands

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Activity type
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Website

Contact the organisation

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VERENIGING VOOR CHRISTELIJK HOGER ONDERWIJS WETENSCHAPPELIJK ONDERZOEK EN PATIENTENZORG

Netherlands

EU contribution
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