ROBot and SENSors INtegration as Guidance FOR Enhanced Computer Assisted Surgery and Therapy

Fact Sheet

Project Information

**ROBOCAST**

Grant agreement ID: 215190

Project website [](#)

**Status**

Closed project

**Funded under**

FP7-ICT

**Overall budget**

€ 4 545 547

**EU contribution**

€ 3 450 000

**Coordinated by**

POLITECNICO DI MILANO

Italy

**Start date**

1 January 2008

**End date**

31 December 2010

Project description

Cognitive Systems, Interaction, Robotics

The ROBOCAST project aims to develop ICT scientific methods and technologies which focus on robot assisted keyhole neurosurgery. A modular system, allowing a reduction of the footprint, will be developed with two robots and one active biomimetic probe, able to cooperate among themselves in a biomimetic sensory-motor
An integrated framework. A gross positioning 3-axes robot will support a miniature parallel robot holding the probe to be introduced through a "keyhole" opening into the skull of the patient. Optical trackers (tracking the end effector and the patient), an imaging endoscope camera, and electromagnetic position and force sensors (on the probe) will extend robot perception by providing the control system with position and force feedback from the operating tools, and with visual information of the surgical field. Path planning outside and inside the body will be autonomously proposed by the control system by processing of preoperative diagnostic information. The path inside the brain will be planned on the basis of a "risk atlas" reproducing a fuzzy representation of a brain atlas, relating structures to a "level of danger". Construction of the atlas will rely on cognitive learning, where the system will be able to provide the surgeon with explanations for any suggested action. Semi-autonomous plan updating, following unforeseen changes occurring during surgery and based on processing of information gathered intra-operatively (e.g. ultrasonic images), will be negotiated between the system and the surgeon, where the latter will be allowed to specify any additional constraints to the planner. Ex-ante- and final path plan inside and outside the body will thus stem from the interaction between the surgeon and the intelligent core of the system. The interface between the system and the user will require minimal interaction while providing maximum information i.e. an intuitive interface which relies on context-based interpretation of surgeon commands.

Field of science

/macro and health sciences/clinical medicine/surgery
/ engineering and technology/electrical engineering, electronic engineering, information engineering/electronic engineering/sensors
/ engineering and technology/electrical engineering, electronic engineering, information engineering/electronic engineering/automation and control systems

Programme(s)

Topic(s)

Call for proposal

FP7-ICT-2007-1

Funding Scheme

CP - Collaborative project (generic)
Coordinator

POLITECNICO DI MILANO

Address
Piazza Leonardo Da Vinci 32
20133 Milano
Italy

Website
Contact the organisation

Administrative Contact
Giancarlo Ferrigno (Prof.)

Activity type
Higher or Secondary Education Establishments

EU contribution
€ 618 012

Participants (12)

UNIVERSITAET KARLSRUHE (TECHNISCHE HOCHSCHULE)

Address
Kaiserstrasse
76131 Karlsruhe

EU contribution
€ 440 000

Activity type
Higher or Secondary Education Establishments

Contact the organisation

Administrative Contact
Mr Woern (Mr.)

KARLSRUHER INSTITUT FUER TECHNOLOGIE

Address
Kaiserstrasse 12
76131 Karlsruhe

EU contribution
€ 0

Activity type
Higher or Secondary Education Establishments

Website
Contact the organisation

Administrative Contact
Heinz Woern (Prof.)

TECHNISCHE UNIVERSITAET MUENCHEN

Address

EU contribution
### EU contribution

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<th>Address</th>
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<td><strong>Arcisstrasse 21</strong>&lt;br&gt;<strong>80333 Muenchen</strong></td>
<td><strong>Higher or Secondary Education Establishments</strong></td>
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<tr>
<td><strong>Senate Building Technion City</strong>&lt;br&gt;<strong>32000 Haifa</strong></td>
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<td><strong>7 Haeshel St. Southern</strong>&lt;br&gt;<strong>Caesarea Industrial Park</strong>&lt;br&gt;<strong>38900 Cesarea</strong></td>
<td><strong>Private for-profit entities</strong>&lt;br&gt;(excluding Higher or Secondary Education Establishments)</td>
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<td><strong>Edmond J Safra Campus</strong></td>
<td><strong>Higher or Secondary</strong></td>
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## Administrative Contact

- **EU contribution**: € 340 000
- **Address**: Arcisstrasse 21, 80333 Muenchen
- **Activity type**: Higher or Secondary Education Establishments
- **Website**: [Contact the organisation](#)
- **Administrative Contact**: Ulrike Ronchetti (Ms.)

- **EU contribution**: € 184 000
- **Address**: Senate Building Technion City, 32000 Haifa
- **Activity type**: Higher or Secondary Education Establishments
- **Website**: [Contact the organisation](#)
- **Administrative Contact**: Mark Davison (Mr.)

- **EU contribution**: € 145 000
- **Address**: 7 Haeshel St. Southern, Caesarea Industrial Park, 38900 Cesarea
- **Activity type**: Private for-profit entities (excluding Higher or Secondary Education Establishments)
- **Contact the organisation**: [Link](#)
- **Administrative Contact**: Hanan Herscovitch (Mr.)

- **EU contribution**: € 205 000
- **Address**: Edmond J Safra Campus
- **Activity type**: Higher or Secondary
- **The Hebrew University of Jerusalem**: [Israel](#)
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<td>UNIVERSITA DEGLI STUDI DI VERONA</td>
<td>Italy</td>
<td>€ 320 000</td>
<td>Via Dell Artigliere 8 37129 Verona</td>
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<td>AZIENDA OSPEDALIERA DI VERONA</td>
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<td>€ 0</td>
<td>Piazzale Aristide Stefani 1 37126 Verona</td>
<td>Research Organisations</td>
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<td>CF CONSULTING FINANZIAMENTI UNIONE EUROPEA SRL</td>
<td>Italy</td>
<td>€ 156 010</td>
<td>Via Giuseppe Mussi 1 20154 Milano</td>
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</table>
UNIVERSITA DEGLI STUDI DI SIENA

Italy

EU contribution

€ 132 000

Address

Via Banchi Di Sotto 55
53100 Siena

Activity type

Higher or Secondary Education Establishments

Contact the organisation

Administrative Contact

Silvano Focardi (Prof.)

PROSURGICS LIMITED

United Kingdom

EU contribution

€ 480 000

Address

Knaves Beech Business Centre
HP10 9QR High Wycombe

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Contact the organisation

Administrative Contact

Paul Moraviec (Mr.)

IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE

United Kingdom

EU contribution

€ 429 978

Address

South Kensington Campus Exhibition Road
SW7 2AZ London

Activity type

Higher or Secondary Education Establishments

Contact the organisation

Administrative Contact

Shaun Power (Mr.)