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

Fact Sheet

Project Information

ROBOCAST
Grant agreement ID: 215190
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 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.

**Fields of science**

> >

**Programme(s)**

**Topic(s)**

**Call for proposal**

FP7-ICT-2007-1

**Funding Scheme**

**Coordinator**

POLITECNICO DI MILANO
Participants (12)

**UNIVERSITAET KARLSRUHE (TECHNISCHE HOCHSCHULE)**  
Germany  
EU contribution  
€ 440 000  
Address: Kaiserstrasse 76131 Karlsruhe  
Activity type: Higher or Secondary Education Establishments  
Website [Contact the organisation](#)  
Administrative Contact: Mr Woern (Mr.)

**KARLSRUHER INSTITUT FUER TECHNOLOGIE**  
Germany  
EU contribution  
€ 0  
Address: Kaiserstrasse 12 76131 Karlsruhe  
Activity type: Higher or Secondary Education Establishments  
Website [Contact the organisation](#)  
Administrative Contact: Heinz Woern (Prof.)

**TECHNISCHE UNIVERSITAET MUENCHEN**  
Germany  
EU contribution  
€ 340 000  
Address: Arcisstrasse 21  
Activity type: Higher or Secondary Education Establishments  
Website [Contact the organisation](#)
80333 Muenchen

Website

Administrative Contact
Ulrike Ronchetti (Ms.)

TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY

ን lsrael
EU contribution
€ 184 000

Address
Activity type
Senate Building Technion City
32000 Haifa
Higher or Secondary
Education Establishments

Website

Administrative Contact
Mark Davison (Mr.)

MAZOR SURGICAL TECHNOLOGIES LTD

ץ lsrael
EU contribution
€ 145 000

Address
Activity type
7 Haeshel St. Southern
Caesarea Industrial Park
38900 Cesarea
Private for-profit entities
(excluding Higher or Secondary Education Establishments)

Contact the organisation

Administrative Contact
Hanan Herscovitch (Mr.)

THE HEBREW UNIVERSITY OF JERUSALEM

ץ lsrael
EU contribution
€ 205 000

Address
Activity type
Edmond J Safra Campus
Givat Ram
91904 Jerusalem
Higher or Secondary
Education Establishments

Website

Contact the organisation
<table>
<thead>
<tr>
<th>Organization</th>
<th>Activity type</th>
<th>EU contribution</th>
<th>Address</th>
<th>Administrative Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSITA' DEGLI STUDI DI VERONA</td>
<td>Higher or Secondary Education Establishments</td>
<td>€ 320 000</td>
<td>Via Dell'artiglie, 37129 Verona</td>
<td>Eran Vardi (Dr.)</td>
</tr>
<tr>
<td>Azienda Ospedaliera di Verona</td>
<td>Research Organisations</td>
<td>€ 0</td>
<td>Piazzale Aristide Stefani 1, 37126 Verona</td>
<td>Roberto Israel Foroni (Dr.)</td>
</tr>
<tr>
<td>CF Consulting Finanziamenti Unione Europea Srl</td>
<td>Private for-profit entities (excluding Higher or Secondary Education Establishments)</td>
<td>€ 156 010</td>
<td>Via Giuseppe Mussi 1, 20154 Milano</td>
<td>Carla Finocchiaro (Mrs)</td>
</tr>
</tbody>
</table>
UNIVERSITA' DEGLI STUDI DI SIENA
Italy
EU contribution
€ 132 000

Address
Via Banchi Di Sotto
53100 Siena

Website

Activity type
Higher or Secondary
Education Establishments

Administrative Contact
Silvano Focardi (Prof.)

PROSURGICS LIMITED
United Kingdom
EU contribution
€ 480 000

Address
Knaves Beech Business Centre
HP10 9QR Hight 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

Website

Contact the organisation

Administrative Contact
Shaun Power (Mr.)