

**PhD In**  
**Bioengineering**  
**Research Field: Bioengineering**  
**Title: Medical Robotics (n.1 scholarship)**

<b>Scholarships and Financial support</b>	
Monthly net income of 1 PhD scholarship	€ 1.202,84
<b>Context of the research activity</b>	
Number of PhD theses carried out in this research field in the last 3 years	2
Motivations and objectives of the research in this field	<p>The <b>Neuroengineering</b> and <b>medical robotics Laboratory</b> (NEAR Lab) is part of the Bioengineering Department of Politecnico di Milano and includes two sections, one which deals with the neural engineering and one which works in the field of medical robotics. The <a href="#">Medical Robotics Section</a> (MRS) is mainly devoted to biomechanics and computer assisted and robotic surgery. Its main goal consists in the development of innovative methods and devices for clinical and surgical applications. Main research topics at MRS Lab are :</p> <ul style="list-style-type: none"> <li>- Biomechanics and human motion tracking</li> <li>- Medical images processing: multi-modal image fusion (X-ray, CT, MRI, Angiography),</li> <li>- Pre-operative planning and Intra-operative navigation for orthopedic surgery</li> <li>- Localization systems for surgical navigation</li> <li>- Multi-modal graphic user interfaces</li> <li>- Devices for diagnosis and treatment in orthopedic applications</li> <li>- Anatomical surface acquisition</li> <li>- Robotic solutions for surgical interventions</li> </ul> <p>Competences within the laboratory span biomechanics, electronics, computer science and graphics, software design and development.</p>
Methods and techniques that will be developed and used to carry out the research	<p>Research focuses both on theoretical models, methods and technologies to support the design and validation of new surgical robotics systems encompassing all the steps from planning to sensing and actuation. The involvement of other research centers, industrial and clinical partners around Europe, in the frame of the EU funded project ACTIVE (<a href="http://www.active-project.eu">http://www.active-project.eu</a>) reinforces the mix between theory and application which is strength of our PhD.</p>
Educational objectives	<p>The supervisor and his research group support the research development. Seminars and courses encourage an interdisciplinary approach. Laboratory activity completes the research path. Students are also encouraged to spend a period of study abroad (with availability of an additional financial support).</p> <p><a href="http://www.biomed.polimi.it/phd">www.biomed.polimi.it/phd</a></p>

Job opportunities	Job opportunities include research both in academic and private institutions in Italy and abroad, and in industry. Spin-off and startups from research results are encouraged. Employment in this field offers various interesting opportunities.
Composition of the research group	Number of Full Professors 1 Number of Assistant Professors 3 Number of Post-Docs 3 Number of PhD students 3 Number of contracted researchers 1
Names of the research director	Giancarlo Ferrigno
E-mail address, phone number and web-page	<a href="mailto:Giancarlo.ferrigno@polimi.it">Giancarlo.ferrigno@polimi.it</a> 39 02 23993371 <a href="http://www.biomed.polimi.it/nearlab">www.biomed.polimi.it/nearlab</a>
List of 5 Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research	1.Imperial College, London 2.Technion, Haifa 3.Renishaw Mayfield, Zurich 4.Karlsruhe Institute of Technology 5.CNR – ITIA, Milan
<b>Additional support</b>	
<u>Educational activities</u> (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): financial aid per PhD student per year	The PhD Program finances max 800 euros per student, per year. Guarantees a further support of 1000 euros average per student, per year, from other sources (namely tutor research fundings). The PhD program encourages additional support by research groups both for educational and scientific activities.
<u>Teaching assistanship:</u> availability of funding in recognition of support to teaching activities by the PhD student	There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.
<u>Computer availability:</u>	1 <sup>st</sup> year: <i>individual use</i> 2 <sup>nd</sup> year: <i>individual use</i> 3 <sup>rd</sup> year: <i>individual use</i>
<u>Desk availability:</u>	1 <sup>st</sup> year: <i>individual use</i> 2 <sup>nd</sup> year: <i>individual use</i> 3 <sup>rd</sup> year: <i>individual use</i>