



PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 38th cycle

Research Area n. 2 - Electronics

THEMATIC Research Field: CMOS-BASED ELECTRONIC READING PH SENSORS FOR BIOMOLECULAR TESTS

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

<p>Motivation and objectives of the research in this field</p>	<p>This research aims to study the behavior of active electrochemical sensors in C-MOS technology based on floating-gate transistors (isFET) in the presence of chemical and biological targets (DNA / RNA), characterize their performances and propose industrial solutions for complete sample-to-answer integrated systems.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>1) Design of sensors for PH analysis based on STm CMOS technology; 2) experimental validation of the sensors in laboratory and their development toward industrial feasibility; 3) development of an electronic platform for real-time acquisition and analysis of the data</p>
<p>Educational objectives</p>	<p>The PhD candidate will develop a strong background in bio-electronic systems, with specific skills in low-noise electronics and FPGA-based real-time digital processing. It is expected that he/she will develop a strong attitude in conducting an independent research project, from the conception to the experimental validation and to the dissemination of results.</p>
<p>Job opportunities</p>	<p>The broad applicability of the skills acquired during this research project will give the opportunity for a career in industrial companies oriented to the R&D of innovative bioelectronic systems. Moreover, the skills in developing</p>



	an entire instrument also offer an opportunity for working in innovative startup companies.
Composition of the research group	1 Full Professors 2 Associated Professors 0 Assistant Professors 4 PhD Students
Name of the research directors	Marco Sampietro (POLIMI), Marco Bianchessi (STm)

Contacts	
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>The PhD candidate will be asked to contribute to the MSs students' supervision in the Innovative Integrated Instrumentation for the Nanoscience laboratory (I3N Lab) of the Electronics, Information and Bioengineering department and collaborate with the teams involved there</p> <p>LIST OF UNIVERSITIES, COMPANIES, AGENCIES AND/OR NATIONAL OR INTERNATIONAL INSTITUTIONS THAT ARE COOPERATING IN THE RESEARCH: 1. SCITEC - CNR, Istituto di Scienze e Tecnologie Chimiche "G. Natta", Milano, Italy; 2. Danmarks Tekniske Universitet (DTU) Dept. Biotechnology and Biomedicine (DTU Bioengineering), Lyngby (Denmark); 3. University "Vita-Salute" San Raffaele, Milan (Italy)</p> <p>EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student 5.707,13 Euro per student</p>



TEACHING ASSISTANTSHIP: (availability of funding in recognition of supporting 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.

COMPUTER AVAILABILITY: individual use

DESK AVAILABILITY: individual use