

ICT PHD

Research project for a PhD curriculum in Industrial Applications of ICT

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(**) Foreign Co-tutor:

Proposed Title of the research: Study, design, and realization of non-invasive sensors for blood analytes using low-cost technologies

Keywords: (5) Optoelectronics, optical measurements, sensors, ophthalmic instrumentation, precision electronics

Research objectives: --(max 10 rows)

The project is devoted to develop new and innovative sensors for blood analytes using low-cost technologies.

In particular, the research project will focus on the study of blood analytes during extracorporeal circulation developing new sensors using compact and low-cost optoelectronic techniques. In the extracorporeal circulation of the blood, the new sensors will provide concentration of some analytes during the flow in real-time and possibly without contact. Starting from the analysis of the literature and from commercial devices, measurement approaches, components, assembly technologies will be identified to ensure the development of high-performance, compact and low-cost sensors. The systems may include a disposable part to be integrated with the tubing of the extracorporeal circulation systems.

Proposed research activity -- (max 10 rows)

The purpose of the proposed research project is to study and develop new optoelectronics methods and instrumentation for biomedical smart sensors. The broad interdisciplinary program addresses electronics and measurements methods to vision research needs.

The research activities include but are not limited to:

Theoretical and simulative models to design the optics and the electronics of the system

Design and realization of the measuring system

Develop of the system algorithms and software to extract the information of interest

In-vitro tests to determine the performance of the measuring system

In-vivo tests to determine the performance of the measuring system

Supporting research projects (and Department)

Dipartimento di Ingegneria “Enzo Ferrari”

Tecnopolis di Mirandola

Life Elettronica srl

Possible connections with research groups, companies, universities.

Tecnopolis di Mirandola