Call for application
PhD for an Ultra-Flexible Organic Oxymeter
(UFOO) (W/M)

Localisation: École des mines de Saint-Étienne
880, route de Mimet, F-13541 Gardanne FRANCE

Entity/Service: Mines de Saint-Etienne, Georges Charpak Provence buildings / Flexible Electronics Department (FEL)

Contract type PhD

1. CONTEXT

1.1 IMT Presentation

Institut Mines-Télécom is a public institution dedicated to higher education and research for innovation in the fields of engineering and digital technology. Always tuned in to the economic world, it combines high academic and scientific legitimacy with a concrete presence alongside companies and a unique focus on the major transformations of the 21st century: digital technologies, the environment and energy, industry and education. Its training and research for innovation are conducted in the Mines and Télécom Graduate Schools under the supervision of the Ministry for Industry and Electronic Communications, in two subsidiaries and in institutions that are associate partners or under contract. Institut Mines-Télécom is a founding member of the Industry of the Future Alliance. It has two Carnot labels for the quality of its research partnerships. Every year, around seventy startup companies leave its incubators.

1.2 School Presentation

Mines Saint-Étienne, an IMT graduate school under the supervision of the Ministry of the Economy and Finance, is responsible for training, research and innovation, transfer to industry and scientific, technical and industrial culture. Mines Saint-Étienne represents: 1,800 engineering students and researchers in training, 420 employees, a consolidated budget of €50 million, two campuses (one in Saint-Étienne (Loire) with three sites, one located in Gardanne (Bouches-du-Rhône), 5 training and research centres, 7 research laboratories, a scientific, technical and industrial culture centre ("La Rotonde") and development projects in France and abroad.

1.3 Working environment

The last decade, numerous supplementary diabetes cases were declared around the World and growing drastically. Diabetes is causing ulceration. Particularly, in cases of diabetic patient, such ulcerations are aggravated by a poor on-site oxygen distribution and provokes infection. Up today, no physiological parameters are periodically and locally on-site recorded to control and prevent such
infection risks. Only a visual control is proceeded by human eye (physician or nurse). Nonetheless, we know that some localized-physiological measurements (such as Temperature, Pressure, humidity and oxygenation) could give numerous information to heal cutaneous ulceration and prevent amputation.

2. MISSIONS AND ACTIVITIES

PhD objectives are the realization of a cutaneous patch to measure the ulceration oxygenation, by photoplethysmography (PPG) technique. Innovation will come by the realization of monolithic, ultra-flexible patches that include OLEDs (emitting in Green, Red or Near-InfraRed), Organic Photodetector (OPD) and organic read-out electronics (RC filters, amplifiers).

Oxygenation ulceration measurements will be done in collaboration with INSERM Grenoble laboratory. OLEDs pixels will be co-realized with an industrial partner (TecMOLED company) that is embedded in the Georges Charpak Campus. The PhD lasts 3 years-long and starts in September 2020.

3. TRAINING AND SKILLS

Applicant from Master degree in Materials Science and/or Nanosciences Engineering and/or Electrical Engineering that are willing to interface electronics with Living systems or biomedical devices. Knowledges in Biology and Organic Electronics are advantageously considered. (Under 30 years-old to the date of application).

4. OTHER INFORMATION AND HOW TO APPLY

PhD is located to the Centre de Microélectronique de Provence, in the Georges Charpak Campus (Gardanne City, France).


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<th>CV and motivation letter to:</th>
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<tbody>
<tr>
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