

Post-doc position available in embedded electronics

Study, development and test of a remote optically powered sensor system for submarine observatories

A postdoc position is open at the Lab-STICC, UMR CNRS 6285 Laboratory in the field of embedded electronics and sensors. The researcher will join the CAPTMER project funded by Brittany Region and work in close collaboration with the IFREMER marine research center. The main objective of CAPTMER is the extension of a network of optically-powered sensors in marine environment.

The candidate must either be a non-French national or must have spent at least 12 months in the past 3 years, in a country other than France.

The researcher will be employed by the ENIB (National Engineering School of Brest) in the Multi-Physics Devices and Interfaces team of the Lab-STICC laboratory. He or she will be based at IFREMER.

IFREMER and Lab-STICC/ENIB have previously worked on seafloor observatories. The cooperation was mostly focused on the possibility of simultaneously supplying power and recovering data from a remote sensor using a single optical fiber [1, 2]. The optical and optoelectronic architectures have been defined and validated in order to supply the sensor with maximum power while maintaining the quality of the data transmission.

In this context, the CAPTMER project is dedicated to the realization and the in situ implementation of a demonstrator. This project requires prior testing, optimization and experimental validation of the technological choices for electronic interfaces on both sides of the optical link, of the high-speed upstream and downstream data transmissions and of the communication protocol. The strategic and technological choices will be made based on previously conducted studies.. Ultimately, the architecture of the system should result in a miniature design.

The researcher will be in charge of optimizing communications with the sensor, implementing the demonstrator and running tests in situ. This work will involve several parts:

- The theoretical study to improve the versatility of the terminal to eventually host other types of sensors;
- The feasibility study of the implementation of an asynchronous communication protocol (Ethernet, ...);
- The determination of the optimum architecture for the electronic modules and their implementation.
- The implementation of the optically-powered chain and the characterization of the final system.

The candidate should have a doctorate in the field of electronic. He or she will have to demonstrate theoretical and practical skills in electronics and embedded software (FPGA, microcontrollers, IDE, programming languages C / C ++, ...), in the fields of data transmissions and low power electronics.

The contract starts on 1 October 2015 for a period of 18 months. The candidate must send curriculum vitae, including a detailed description of his or her previous as well as professional references to:

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André Pérennou

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[1] « Quasi-all-optical network extension for submarine cabled observatories » Frédéric Audo, et al. Optical engineering, SPIE, 50 (4), pp. 045001, april 2011.

[2] "A low consumption electronic system developed for a 10km long all-optical extension dedicated to sea floor observatories using power-over-fiber technology and SPI protocol" Steven Perhirin et al. Microwave and Optical Technology Letters, Wiley-Blackwell, 2013, 55 (11), pp.2562-2568.