



Personnel non statutaire financé sur fonds FEDER
Description du poste : Ingénieur
Research Engineer in Cognitive Radio

Context: This Research Engineer position, is offered in the context of SMARTIES project which is a project of the ELSAT2020*, that aims to develop a set of cognitive radio blocks (rational use of the spectrum, use of free-bands TV-white space, energy sobriety, resilience to evolutions and interference, etc.) adapted to the railway environment (both ground-train vital and non-vital communications).

Such radios are opportunistic or "aware" of their environment and able to control their influence on the environment and adapt their transmission / reception parameters according to this environment (coverage, interference, available bands, available systems and services). Our objective is to test a set of spectrum sensing and blind digital modulation & waveforms detection algorithms developed jointly between the IEMN-DOAE and IFSTTAR, by conducting in-lab tests firstly, and then performing embedded tests in the Lille Flanders station using a platform SDR (Software Define Radio) based on USRP RIO boards.

Missions:The work will consist in the implementation of a set of plectrum sensing and blind digital modulating & waveforms detection algorithms on a cognitive radio platform using 2 SDR NI USRP RIO boards available within the DOAE. A state of the art of these algorithms will be performed firstly. Then, the candidate will carry out operational tests in the laboratory. Thereafter, He will evaluate their performance in the railway environment using on-board measurements.

The candidate has to answer the following research missions:

- 1- Adapt a range of spectral sensing algorithms developed at the DOAE & IFSTTAR (i.e. PET, SPET and Beamforming) to high speed (i.e. railways)
- 2- Implement these algorithms on NI USRP RIO SDR boards
- 3- Perform operational tests in the laboratory
- 4- Evaluate their performance in the railway environment using on-board measurements
- 5- Evaluate the performance of a waveform blind detection algorithm, developed at DOAE, on SDR boards by conducting in-lab testes
- 6- Attending project meetings and workshops that will be organized by the OS4 of the CPER ELSAT.

Skills :

Wireless communications, signal processing, cognitive radio, signal processing, SDR, Matlab simulation, Labview, knowledge of Railway domain will be a plus.

Know-how : Autonomy, dynamism and reactivity, sense of initiative, good relationship, rigor, taste for hardware implementation

Date de recrutement souhaitée : April 2019

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Lieu de rattachement : IEMN DOAE (UMR 8520) – Université Polytechnique Hauts de France (UPHF), Valenciennes.

gross monthly salary: 2645 €

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