

Post-Doctoral Position at XLIM Research Institute, Limoges, France.

Compressive multiplexer for passive microwave imaging system

Research Context

XLIM institute has recently developed new imaging techniques using the frequency diversity of passive devices to code and sum the received information on an antenna array into a single signal. Those devices are able to address simultaneously and independently each radiating element of a multi-antenna system. Used in reception, they constitute a passive multiplexer to code the signals received by an antenna array to a common output through orthogonal channels. The incoming signals on each antenna can be retrieved from the received waveform by deconvolution techniques. Thus, the reconstructed signals are processed to apply numerical beamforming or conventional near field imaging technics. This technique of passive multiplexing simplifies the reception chains for microwave imaging systems (whose complexity and cost highly in-crease with the number of antennas).

Research project

The objective of the post-doc position is to participate in the development of a fast radiometric imaging system at millimeter waves (W band). To improve acquisition time, the mechanical scanning of classical systems to rasterize the scene in 2D will be replaced by a simultaneous reading of the signals received by an antenna array. This instantaneous imaging process will be achieved through the development of a passive multiplexer, based on recent work at XLIM research institute. The digitized signal will be used to rasterize the scene by applying an innovative algorithm.

The work to be performed include 4 main steps:

- Multiplexer design in W band
- Signals demultiplexing by deconvolution techniques
- Imaging post processing
- Experimental set up and validation

The duration of the project is, at least, 12 months with an expected start in November/December 2015.



Keyword

Microwave imaging, signal processing, inverse problems, radar

Expected Expertise

Applicants are expected to be familiar with microwave imaging technics and signal processing. A good practical knowledge of design tools such as CST microwave studio and of Matlab programming is required. Moreover, the willingness to perform experimental work will be appreciated.

Contact

Cyril Decroze,
XLIM, University of Limoges
cyril.decroze@xlim.fr
Tel.: +33 5 55 42 60 59

Candidates are invited to submit a CV, a cover letter, and a list of references to: Cyril.decroze@xlim.fr