



Postdoctoral position - *Development of High-Resolution Radar Signal Processing Algorithms : Application to Space Debris Detection*

<i>Keywords</i>	<i>High resolution radar, pulse compression, signal processing, radar processing, waveform, target detection, target tracking, angles of arrival, range, doppler frequency, beamforming, space debris.</i>
<i>Organisation</i>	<i>University of LIMOGES</i>
<i>Research Laboratory</i>	<i>XLIM Laboratory, UMR CNRS 7252, University of Limoges, Limoges, France.</i>
<i>Duration</i>	<i>18 months</i>
<i>Job status</i>	<i>Full-time</i>
<i>Application deadline</i>	<i>Submit your application as soon as possible. Evaluation of candidates will begin immediately, and continue until the position is filled.</i>

Context:

The detection and tracking of targets (objects) are an issue for many applications. We are interested in these works in the detection and tracking of objects in the context of space applications.

Research environment and missions:

The candidate will join the Antennas and Signals team of the RF systems scientific pole of the XLIM Research Institute (<https://www.xlim.fr/recherche/pole-electronique/systemes-rf>)

The candidate will work on advanced radar signal processing techniques: pulse compression, adaptive beamforming, target detection and tracking which consists in the fine estimation of target parameters as range, azimuth and elevation angles of arrivals, and Doppler shift.

The objective is therefore to develop high-resolution radar algorithms for space applications. The Post-doctoral fellow will have the following missions:

- Study and selection of radar waveforms: in order to choose the most appropriate waveform in the context of the space application, studies and simulations will be performed using MATLAB. At the end of this study, the waveform that will give the best performance in terms of detection will be selected.
- Design, develop, and validate high-resolution radar signal processing algorithms.
- Evaluation and comparison of the results of different signal processing techniques developed.
- Develop a high-resolution multi-antenna radar simulator using MATLAB applied to space surveillance. This simulator must integrate the functions of emitting and receiving noisy signals in the presence of debris with low Radar Cross Section.



- Test and evaluate the performance of implemented algorithms. First, simulation signals will be used for validation and experimentation. Secondly, the performance of the algorithms will be evaluated by injecting the demodulated and digitized signals into the radar simulator.
- Write technical reports and articles.

Requirements:

The candidate must have a Ph.D. specialized in signal processing, preferably with an application in the radar or antenna processing domain. The selected candidate must have a very good team spirit, good interpersonal skills, good programming skills (Matlab or other), and a good level of written English.

To apply :

Please send your application to moctar.mouhamadou@xlim.fr, cyril.decroze@xlim.fr including:

- A detailed Curriculum Vitae
- An application letter
- A reference letters