µROBOTEX PROJECT
Automation of micro-nano sample preparation for EBSD analysis

DATE ADVERTISED	
POSITION TYPE	Post-doctoral position
LOCATION(S)	FEMTO-ST Institute (Besançon - France)
SUPERVISOR(S) /REFERENT(S)	S. DEMBELE, N. PIAT, P. LUTZ, G. GARRY

START DATE	1ST OF FEBRUARY 2016	**DURATION**	12 months
SALARY	25000 EUROS		

JOB DESCRIPTION

The project will be achieved within the AS2M Department from the FEMTO-ST Institute, Besançon, France, in collaboration with the THALES RT company, Palaiseau, France. It will be based on some developments already made during the NANOROBUST project funded by the ANR, and will use the µROBOTEX facility funded by the french government (PIA program) and the region Franche-Comté, that includes a dual beam (SEM/FIB i.e. Scanning Electron Microscope / Focused Ion Beam) system, a 3-gaz injection system, two micro-manipulator robots. Two types of samples will be involved: micro-needles of scintillator (5-10 µm diameter, 200-300 µm length), VO2 nanowires (square of 20-30 nm side length, about 10 µm length).

EBSD (Electron Back Scattering Diffraction) is a well known crystallographic analysis technique using SEM. It enables the determination of crystal phases and orientations of the sample, and requires the one to be as flat and polished as possible. In the case of the micro-needles and nanowires, their current fabrication processes lead to unstructured set of samples from which some have to be selected for analysis. So, the EBSD analysis of these samples requires an important preparation stage that is currently manual, long and difficult.

The aim of the project is the development of generic micro-vision and micro-robotic functions enabling the automation of the preparation of micro-nano samples for their EBSD analysis. The preparation will include: microrobot based lift-out of the selected samples from their original substrates using SEM feedback, FIB soldering and milling of the samples on the analysis substrate.

WHO WE ARE LOOKING FOR

The applicant should have a strong background in engineering, micro-vision, micro-robotics and C++ programming. He must master the following topics: camera calibration, object tracking, image-based visual servoing, robust control.

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