

2-year Post-Doctoral fellow in 3D and 4D X-ray phase contrast image analysis

Background

The analysis of the internal structure of biological tissues and/or materials has become a major issue in several scientific programmes. X-ray phase contrast tomography is a method of choice for studying matter in 3D, attaining increasingly higher levels of sophistication. The enhancement of the method's performances has been possible through the improvement of the detection resolution. In ten years, the average size of 3D image data sets has increased from 5 GB to 500 GB, but the processing capacity has not followed.

The goal of the GigaQuant project (a "Fonds Unique Interministeriel" project that has been granted a funding of 2.5 M€) is to overcome this technological gap in order to reach processing times in line with the needs of the research facility users. The team "Synchrotron Radiation and Medical Research" of the Université Grenoble Alpes, present on the site of the ESRF - The European Synchrotron -, Grenoble, will work in close collaboration with the teams of the ESRF biomedical beamline (ID17). These world-class research organisations will be able to collect user needs, bring along their own expertise and be able to test the software solutions developed for the new imaging modalities under development at the ESRF.

Functions

The large data volumes hamper, for the time being, their effective analysis; GigaQuant will speed up the processing time starting from state-of-the-art research tools and topics. Besides, the developed technology will be flexible and easily adaptable to a broad range of data acquired with different imaging techniques. A specific focus will be made on ultra-fast dynamic 3D imaging using phase-contrast microCT. This extremely powerful technique, which in few years became the dominant X-ray imaging method used at synchrotrons, requires the creation of innovative algorithms to process the specific signal characteristics.

You will be in charge of the development of new algorithms for processing and analysing the imaging data acquired at the ID17 laboratories. This work will be done in close collaboration with the partners of the Gigaquant project (Reactiv'IP, Digisens, Aix Marseille University, TOTAL) using the libraries developed by both Reactiv'IP and Digisens.

Qualification and experience

You should hold a PhD in applied mathematics, image processing, computer science, physics, or closely related scientific areas. A strong background in scientific software development is required. Familiarity and experience with 3D phase contrast imaging techniques will be an asset.

Our offer

A 2 year post-doctoral contract with the Université Grenoble Alpes. The work site will be the ID17 biomedical beamline of the ESRF.

If you are interested in this position, please send CV and cover letter to the following contacts

Contacts

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