Post-Doctoral Research Fellowship - 12 months

Title : Simulations in X-Ray Spectral Radiology

Context
The CREATIS laboratory opens a Postdoctoral Research fellowship of 12 months to work on the project SPEPIX "SPEctrométrie PEtits PIXels pour Imagerie X" funded by the French ANR (National Research agency). CREATIS is a research unit of CNRS and INSERM both recognized by INSA Lyon and University of Lyon, specialized in medical imaging. CREATIS gathers teams working on various modalities (X-rays, Ultrasounds, MRI, PET and optics) and on new image processing techniques for various medical applications. This project relies on a collaboration with 3 other partners, the CEA-LETI, Grenoble, TRIXELL, the ILM laboratory (Institut Lumière Matière), Lyon University

Project
X-ray "color" or "spectral" imaging is raising increasing interest in radiology. Recent works have shown the feasibility of new Spectral CT systems with energy resolving detectors to provide energy-selective images. This information can be used to identify specific constituents of the human body such as bone, water, fat or concentration in contrast agents.
The goal of this project is to develop new flat panel detectors with spectrometric properties in the context of radiology. To test the efficiency of the new detectors and their performance in the identification of materials, a simulation study will be undertaken.

The aim of the work will be to develop X-ray simulations in the context of spectral radiology. This will include both the simulation of energy selective radiographs and their processing in view to quantify different constituents from these images. The simulation will be performed through deterministic approach and the GATE platform (based on Geant4). The candidate will join Team 4 "Tomographic Imaging and Radiotherapy" having expertise in X-ray imaging, Monte Carlo simulations and tomographic reconstruction.

Profile:
Education: The candidate must hold a PhD in medical imaging or image processing
Knowledge in radiation physics, optimization would be appreciated
Programming skills: Matlab, C, C++
Experience: Monte Carlo simulations, tomographic reconstruction
Languages: French, English required
Location: CREATIS, INSA Lyon
Salary: ~1900€ month
Period: 1 year starting January 2014

Contacts :
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