

Post-doctoral position at the « Imaging and Modelling in Neurobiology and Cancerology » lab, UMR 8165 CNRS Paris 7 University - Paris 11 University, Orsay, France

Key words : Monte Carlo simulations, Hadrontherapy, Emission Tomography, Geant4, GATE

Our research group is looking for a talented researcher to join the European ENVISION project, dedicated to the development of in-beam emission tomography. The idea of in-beam emission tomography is to monitor radiotherapy (more precisely hadrontherapy) treatments of cancer using on-line imaging, namely emission tomography. Such on-line monitoring might help to adjust the beam parameters to optimize the local dose deposit while sparing organs-at-risk.

The role of the IMNC group in the ENVISION project is to develop and provide an accurate simulation tool to model both the hadrontherapy component and the imaging component of the emerging field of in-beam emission tomography, based on the GATE simulation tool. GATE is a simulation tool dedicated to the simulation of preclinical and preclinical scans acquired in Emission Tomography (Positron Emission Tomography, Single Photon Emission Computed Tomography), Computed Tomography, and radiotherapy treatments. GATE is developed by an international collaboration (www.opengatecollaboration.org) and is used worldwide by more than 1000 users. The Geant4 physics models included in GATE still have to be validated for hadrontherapy applications. GATE also has to be extended to allow for modelling of full in-beam emission tomography experiments. The tools developed in the context of the project will be used by other participants to the ENVISION project, to optimize detector design, acquisition protocol, image reconstruction, and dose calculation.

The responsibilities of the candidate will include the developments of missing components in GATE that are needed to fully model in-beam emission tomography experiments, and the validation of the models against real data.

We are looking for researchers who have experience in:

- Monte Carlo simulations,
- Emission Tomography,
- Radiotherapy and/or Hadrontherapy physics,
- GATE and/or Geant4.

This is an exciting 4 year project which will provide opportunities for both basic research as well as development/deployment of fully functional methods for medical applications, in close collaboration with physicists, computer scientists, engineers from various countries (15 European labs and companies involved in the project), to contribute to the design and validation of a GATE version suitable to modelling in-beam emission tomography experiments.

This European FP7-cooperation post-doctoral position is for 30 months. The successful candidate will be based at the « Imaging and Modeling in Neurobiology and Cancerology » research lab, UMR 8165 CNRS Paris 7 University - Paris 11 University, in the Orsay campus (20 km south of Paris), France.

If interested and for further information, please email resume and two references to Irène Buvat (buvat@imnc.in2p3.fr).