Post-Doctoral position opening in Deep-Learning PET reconstruction
Department of Radiology, University of Pennsylvania

We have an opening for the postdoctoral researcher with experience and skills in the areas of PET image reconstruction, data quantification, and deep-learning approaches. This position is sought for our NIH project developing and studying novel deep-learning PET reconstruction approaches involving traditional and novel imaging compounds and scanners with a variety of geometries for both clinical and specialized research applications. The position is available immediately.

Duties: The postdoctoral researcher will work together with our team on research projects involving image reconstruction and data-correction problems in Positron Emission Tomography. Specific tasks will include development, implementation, investigation, and evaluations of novel deep-learning PET reconstruction approaches within the DIRECT (Direct Image Reconstruction for TOF data) framework. This may include resolution modeling, spatial and temporal regularization, and motion and other data corrections for whole-body, total body, and dual panel (limited angle) PET data, with particular focus of this postdoctoral researcher to be to dedicated to the long axial field-of-view data from the total body PennPET Explorer scanner. Duties in general will include implementation, optimization and evaluation of new methods, performing studies using simulated and experimental data, and writing computer programs for testing new methods and their application into clinical practice. The postdoctoral researcher is expected to work in a team of several faculty members with other postdocs and students, write papers, present results at conferences, and participate in the research seminars.

Required skills: Ph.D. in medical physics, computer science, or related field, with solid mathematical background in the development of image reconstruction and deep-learning algorithms. Practical research experience in the deep-learning and PET image reconstruction, and data corrections is desirable. The candidate should be able to work independently within a team environment, and have outstanding programming and algorithm implementation skills in lower-level languages (such as C++), higher level tools (such as MATLAB), and neural-network software environments (such as PyTorch or TensorFlow). Good command of English is required.

Group: Our Physics Instrumentation lab has extensive experience and track record (40 years) in development of state-of-the-art PET instrumentation including detectors, electronics, and novel data correction and reconstruction tools. Our lab is within a clinical department facilitating collaborations with clinical and research staff as well as opportunities to apply our techniques in both clinical and research settings. We have also a long history of industry collaborations enabling transfer of developed technology and tools into commercial scanners. Our group is part of the EXPLORER consortium in which we have developed a very long axial field-of-view PET scanner, which has been be installed in clinical research space at Penn, thereby enabling translation to human studies. This project in particular offers many exciting challenges and opportunities for implementing and evaluating new reconstruction methodologies.

Interested individuals should send a CV, letter of interest, and a list of three references to Samuel Matej.

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