Title: Postdoctoral internship position in attenuation correction of PET medical images using artificial intelligence (AI)

Positron emission tomography (PET) is a medical imaging modality using radiotracers injected to patients, radiation physics concepts to measures high-energy radiation and tomographic reconstruction principles to obtain 3D images of *in vivo* radioactivity distribution. Design, development and operation of leading-edge PET scanners for medical imaging is the specialty of the LabTEP team. The "LabPET" technology, initiated by the research team, is applied to preclinical biomedical studies on animals and clinical studies on the human brain.

The object of the project is to apply the concepts of artificial intelligence (AI) to attenuation correction of medical images acquired by PET imaging. Testing is carried out using digital simulations and measurements on preclinical and clinical PET scanners in order to extract attenuation correction parameters using AI and applying them to a set of case images.

Key tasks:

- Act as an AI expert for the LabTEP team.
- Develop computer simulations for attenuation assessments of the images and apply AI methods for image correction.
- Develop and apply PET imaging acquisition protocols on clinical and preclinical scanners for computer simulation validations in real-life using AI methods.
- Develop testing methods and implement data processing tools.
- Ensure tools validation.
- Provide written analysis, scientific papers and oral presentations.
- Contribute to the data infrastructure implementation.
- Ensure knowledge transfer to the LabTEP team.
- Maintain a technological watch for new developments and best practices in artificial intelligence in a medical imaging context.
- Work in close collaboration with multidisciplinary professionals and research scientists from medical, engineering and artificial intelligence fields.

General education:

- PhD degree in a related area of specialization (computer science, mathematics, physics, medical physics, computer engineering).
- Three (3) years of experience in a related area of specialization (artificial intelligence, medical imaging, medical physics, mathematics, computer science).

Skill requirements:

- Experience in artificial neural networks, deep learning, machine learning, artificial intelligence
- Experience in big data management and handling
- Experience in Linux, Python, C++, bash and R
- Experience in medical image database in DICOM format
- Experience in collaborative and version management systems (git or others)
- Good problem-solving skills, good sense of optimization and solution evolution

- Ease of communication and good adaptability in a highly multidisciplinary environment
- Initiative and team spirit, excellent organization skills, ability to conduct projects autonomously
- Francophone working environment; proficiency in English is required.

Duration: 2 years

***Note that the project will not be carried out on patients.

Professor Roger Lecomte, Ph. D.
LabTEP Laboratory
Université de Sherbrooke
Email: Roger.Lecomte@USherbrooke.ca
Phone: (819) 820-6868, ext. 14608
Web Site | Linkedin