Postdoctoral Fellow in Advanced Machine Learning Techniques in Brain Imaging

Hurvitz Brain Sciences Program and Physical Sciences at the Sunnybrook Research Institute
Departments of Medicine and Medical Biophysics
Temerty Faculty of Medicine, University of Toronto

PIs: Maged Goubran, PhD
Assistant Professor, Scientist
Medical Biophysics
University of Toronto

Sandra Black, MD, FRCP
Professor, Director Brain Sciences
Neurology
University of Toronto

Description of the Position: We are seeking a postdoctoral fellow to lead development of novel, machine learning algorithms for the analysis of MRI and microscopy data. The position is with the Sandra Black Centre for Brain Resilience & Recovery, the LC Campbell Cognitive Neurology Research Unit, and the Hurvitz Brain Sciences Program at the Sunnybrook Research Institute. This dynamic and collegial research environment provides opportunities to participate in pioneering techniques that will be used to understand and treat neurodegenerative and neurovascular disease. Current large multi-site studies and trials include the Ontario Neurodegenerative Disease Research Initiative (ONDRI), the Toronto Dementia Research Alliance (TDRA), Brain-Eye Amyloid Memory Study (BEAM), and Medical Imaging Trials Network of Canada-C6 (MITNEC-C6).

The position requires working closely with the PIs Dr. Goubran (machine learning, neuroimaging, computational neuroscience), Dr. Black (neurology, small vessel disease, cognition) and with graduate students, imaging analysts and software developers in the lab to develop, improve and apply novel computational approaches to challenging image analyses and patient outcome prediction problems. This will be performed in collaboration with our internal and external international collaborators including neurologists, radiologists, surgeons, psychologists, physicists and computer scientists. There will be opportunities for multiple publications on novel computational tools for dementia, stroke and neuroscience research.

Required Qualifications:
• PhD received within the last 5 years or graduating PhD candidate (within the next three months) in computer science, biomedical engineering, neuroscience, biological science, or related discipline
• Strong research record
• Excellent verbal and written communication skills
• Proficiency with programming languages (Python/MATLAB, C/C++, etc.)
• Experience with machine and deep learning libraries Scikit-learn, Tensorflow, Keras or Pytorch
• Intermediate knowledge of Linux and scripting
• Ability and willingness to work in a dynamic interdisciplinary team environment

Preferred Experience and Skills:
• Advanced knowledge of machine learning models for image processing, segmentation or registration
Advanced knowledge of computer vision
Experience with designing data analysis workflows and incorporating existing tools
Working knowledge of neuroimaging software: FSL, FreeSurfer, SPM, ITK or microscopy software: Fiji/ImageJ, Ilastik
Python software packaging, virtual environments, Anaconda/Conda, Jupyter/IPython
Experience with statistical analyses and relevant software: example R or SPSS
Experience with version control systems (Git) and software testing
Demonstrated ability to learn quickly and problem-solve

The Sunnybrook Research Institute, fully affiliated with the University of Toronto, is a dynamic and collegial research environment that provides opportunities to participate in pioneering research.

Applications are encouraged from qualified women and men, members of visible minorities, aboriginal peoples and persons with disabilities. In accordance with Canadian immigration requirements, this advertisement is directed initially to Canadian citizens and permanent residents. We thank you in advance for your interest. Only those candidates selected for an interview will be contacted. No phone calls please. Application screening will continue until a suitable candidate is identified.

Application

To apply for this position, please email:

1) cover letter, 2) Curriculum Vitae, 3) a writing sample (e.g., manuscript), and 4) the names and contact information for three potential references to:

Mr. Christopher Scott
Brain Imaging Analysis Lab Manager
L.C. Campbell Cognitive Neurology Research Unit
Sunnybrook Health Sciences Centre
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Links

● Sunnybrook Research Institute: www.sunnybrook.ca/research
● University of Toronto: www.utoronto.ca
● Heart and Stroke Foundation Canadian Partnership for Stroke Recovery: www.canadianstroke.ca
www.sunnybrook.ca/research/?page=csrhome
● LC Campbell Cognitive Neurology Research Unit: www.sunnybrook.ca/research/?page=cognitiveneurologyhome imaging.brainlab.ca