University _of_ Manitoba | Rady Faculty of Health Sciences
Department of Radiology

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Two-Year Funded Postdoctoral Research Fellow

The Figley NeuroImaging Lab within The University of Manitoba, Department of Radiology invites applications for a two-year funded Postdoctoral Research Fellow.

Job Description: Our lab has previously developed a novel method to automatically extract centerlines from complex 3D digital objects. The theoretical underpinnings of this method, and a preliminary validation using benchmark digital images has been recently published (Younas and Figley, 2019), and we have also been granted a United States patent covering both the underlying method and a number of its potential applications (Patent Number US10438406B2; https://patents.google.com/patent/US10438406B2/en). Therefore, the next steps are: 1) validating the centerline extraction method for a particular medical imaging application using a well-characterized 3D dataset of real-world images, and 2) demonstrating how this can be integrated (at the system-level) with other image parameters to quantify clinically-meaningful features along these centerlines. In the current project, we aim to achieve these goals by using the open-access Rotterdam Coronary Artery Algorithm Evaluation Framework to quantify the accuracy and demonstrate the utility of our method using this as a real-world medical imaging benchmark. Along the way, we also aim to refine the computer code into a more efficient and user-friendly software suite to perform automated quantification of blood vessel diameter and cross-sectional area along the segmented coronary artery branches (e.g., to highlight conspicuous regions that likely require closer inspection by clinicians). The postdoctoral fellow will be responsible for conducting independent research toward these aims, thereby providing a credible proof-of-concept using a real-world medial imaging benchmark to help transition our method from theory into practice.

Qualifications: The successful candidate <u>must</u> have a recent PhD or equivalent (earned within the last 5 years) in computer science, medical physics, biomedical engineering or a related discipline, <u>and</u> have prior research experience, demonstrated through first-authored peer-reviewed publications. The project will require strong organizational skills; a high degree of independence and initiative; superb communication skills (including written and verbal English); excellent computer skills; and the ability to interact and work well with other group members, collaborators, and potential industry partners. Although additional computer programming experience in any language (e.g., Python, C++, etc.) will be viewed favorably, in-depth knowledge and proficiency using Matlab is absolutely essential; and a strong working knowledge of computational geometry, image processing methods and previous experience working with medical imaging data (e.g., MRI and/or CT) is required. Prior experience with the Rotterdam Coronary Artery Dataset and/or machine learning (particularly deep learning) approaches would be an asset, but is not required.

Location, Time Frame and Salary: This appointment will be made through the University of Manitoba Department of Radiology. The PIs lab is based at the Winnipeg Health Sciences Centre, which is the largest tertiary care hospital in Manitoba, and one of the largest in Canada. This project is jointly funded by NSERC and Research Manitoba, and will piggy-back on many

of the resources available through the Manitoba Neuroimaging Platform, which was initially established by a $300,000 Brain Canada Platform Support Grant, and a recently acquired high performance computing server (36 CPU cores, 4 NVIDIA RTX8000 GPU cores, 256GB RAM, 2TB SSD + RAID storage).

The position requires at least a 2-year commitment, with the possibility of a longer-term extension (pending performance and funding). Salary and benefits will be commensurate with qualifications and experience; however, the salary for a first-year PDF is anticipated to be approximately $42,000 CAD/year (including vacation pay and benefits).

Application Submission: The University of Manitoba is strongly committed to diversity within its community and welcomes applications from qualified women and men, visible minority group members, Aboriginal peoples, persons with disabilities, persons of all sexual orientations and genders, and others who may contribute to the further diversification of ideas. All qualified candidates are encouraged to apply; however Canadian citizens and permanent residents will be given priority.

Applications will be reviewed as received, and the position will remain open until filled.

Interested applicants should email: 1) a cover letter outlining their research interests, previous research experience, and their interest in the position/project outlined above; 2) their curriculum vitae; and 3) the names and contact information for at least three references to **Dr. Chase Figley (chase.figley@umanitoba.ca)**.

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