

Biomedical Engineering

Measuring Aspects of Cerebral Vascular System with MRI for Use in Stroke and Aging Applications

Dr. Ethan MacDonald

Biomedical Engineering and Electrical Software
Engineering
University of Calgary
Calgary, Alberta, Canada



DATE: Thursday, March 28, 2024

TIME: 4 p.m. to 5 p.m.

LOCATION: 164 Apotex Building
(college of Pharmacy,
Bannatyne Campus)

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ABSTRACT:

Ethan MacDonald is an Assistant Professor in the Departments of Biomedical Engineering and Electrical & Software Engineering at the University of Calgary. He is also an Adjunct Professor in the Department of Radiology and a member of the Hotchkiss Brain Institute Dementia Neuroteam. He completed technical diplomas in Electronics Engineering at the Nova Scotia Community College, before doing a bachelor's degree at Lakehead University where he obtained a first-class standing. He was awarded the Dean Brawn Medal for highest ranking graduating student and the Professional Engineers of Ontario Medal for Academic Achievement. He moved to Calgary to pursue his passion for skiing, where he completed an MSc and PhD in Biomedical Engineering under the supervision of Richard Frayne, and then completed a Post-doctoral Fellowship with Bruce Pike in the Department of Radiology also at the University of Calgary. Dr MacDonald was appointed as an Assistant Professor in the Department of Electrical and Software Engineering in 2020, and was a founding member of the Department of Biomedical Engineering in 2022. MacDonald's research has included a breadth of experiments involving the use of MRI, including endovascular catheter tracking, quantitative cerebrovascular imaging, and imaging of brain aging physiology.

BIO:

Parameters of the cerebral vascular system can be measured with various technologies, but MRI can quantitatively assess parameters of both the macrovascular (arteries) and the microvascular (capillary bed) with a suite of tools to provide the most complete picture. In addition to the study of blood flow to understand disease, cerebrovascular imaging is core to functional MRI. In this talk, we will discuss the methods available for imaging cerebrovascular parameters, including emerging methods and technologies. Applications to acute ischemic stroke imaging, cerebrovascular disease, and the study of aging physiology are highlighted. Recent advanced machine learning applications for image translation, age prediction modelling, and time series estimation will be discussed.

Everyone is Welcome to Attend!