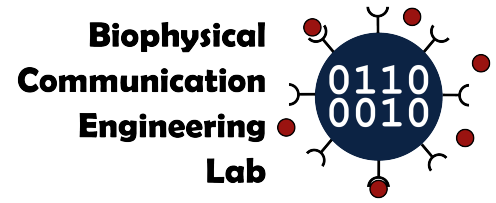




Department of Electrical and Computer Engineering



Research Employment Opportunity: Accelerating Particle-Based Simulations for Signal Propagation in Cancers (M.Eng.)

Project Summary	The BioPhysComm Lab seeks a Master's student to implement software algorithms for the simulation of signaling and communication within tumours.
Supervisor	Dr. Adam Noel
Degree to be Earned	M.Eng. (thesis-based)
Funding	\$19,000 per year for the first two years as a registered M.Eng. student.
Location	Core Science Facility, Memorial University, St. John's, NL, Canada
Target Start Date	May 2025 (or as soon as possible)
Application Components	A complete application should include the following merged into a single PDF: <ul style="list-style-type: none">• Cover letter with a statement of research interests• CV summarizing academic and professional experience• Copy (unofficial) of academic transcript(s)• Writing sample (e.g., technical report or published paper)
Application Deadline	For guaranteed consideration, apply by January 31, 2025
Contact	Email adam.noel@mun.ca for additional information

Project Description

Molecular communication is an emerging interdisciplinary field within communication engineering and inspired by signaling with molecules in nature. Many of our normal biological processes use molecular signaling, and it is also common in biomedical and biological research.

Many molecule transport processes can be characterized as advection-reaction-diffusion processes, which can include any combination of random molecule motion, bulk fluid motion, and chemical reactions. An existing simulation tool developed by the BioPhysComm Lab, AcCoRD (Actor-Based Communication via Reaction-Diffusion), is one of many existing tools to simulate advection-reaction-diffusion processes. More information about AcCoRD can be found at engr.mun.ca/~adamnoel/accord.html.

This employment opportunity is for a Master's student to extend the development of AcCoRD to execute faster simulations. The project will integrate state-of-the-art algorithms in a mix of microscopic and mesoscopic domains to enable more detailed studies of signal propagation in biological environments. The target application is cancerous tumours, which are complex systems with heterogeneous features. The student will also work with a current Ph.D. student who is focusing on the mathematical modeling of signal propagation through tumours.

Selection Criteria

You must have or be close to completing an undergraduate degree in Engineering (Electrical, Computer, Biomedical, or Mechanical), Science (Physics, Biochemistry, Biology, or Computer Science), or closely-related discipline. Exceptional other backgrounds will be considered.

You must meet the admission requirements set forward by the School of Graduate Studies (mun.ca/become/graduate/).

We are particularly interested in candidates with a strong background in programming and mathematical modeling. Familiarity with random processes, fluid transport, and/or cell biology is an asset.

Only candidates selected for an interview will be contacted.

About the BioPhysComm Lab

The Biophysical Communication Engineering (BioPhysComm) Lab works on biophysical signal propagation, cellular signal processing, and molecular communication engineering.

We're interested in the signalling cues that drive the behaviour of living cells and other microscale processes. We're promoting new ways of understanding how cells use molecules to communicate. Our long-term objective is to use communications and signal processing tools to improve the understanding of biophysical processes and how to interact with them at a microscopic level. More information can be found at enr.mun.ca/~adamnoel/research.html.

About the Department of Electrical and Computer Engineering

Housed in Memorial University's new Core Science Facility, the Department of Electrical and Computer Engineering offers degrees in both electrical engineering and computer engineering at the bachelor's, master's, and doctorate levels. No matter what degree you pursue, we want you to feel inspired. We'll challenge you to do your best. We'll connect you with engineering leaders. And we'll mentor you so you'll understand what's possible and what you need to do to get there. More information can be found at mun.ca/engineering/ece/.

About Memorial

As Newfoundland and Labrador's only university, Memorial has a special obligation to the people of this province. Established as a memorial to the Newfoundlanders who lost their lives on active service during the First World War and subsequent conflicts, Memorial University draws inspiration from these sacrifices of the past as we help to build a better future for our province, our country and our world. More information can be found at mun.ca/main/about/.

Equality, Diversity, and Inclusion Statement

Memorial University is committed to employment equity, diversity, inclusion, and anti-racism, and encourages applications from all qualified candidates, including: women; people of any sexual orientation, gender identity, or gender expression; Indigenous Peoples; visible minorities and racialized people; and people with disabilities. Memorial is committed to providing an inclusive learning and work environment. If there is anything we can do to ensure your full participation during the application process please contact equity@mun.ca directly and we will work with you to make appropriate arrangements. In assessing applications, Memorial recognizes the legitimate impact that leaves (e.g., parental leaves, leave due to illness) can have on a candidate's record of achievement.

Land Acknowledgement

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.