

LURA/USRA Posting Information	
Position Type:	<input checked="" type="checkbox"/> Lassonde Undergraduate Research Award- summer research <input checked="" type="checkbox"/> NSERC USRA <input type="checkbox"/> Other (please specify)
Position Title:	Research Assistant/summer researcher
Location:	BCEE 328
Professor:	Hossein Kassiri
Department:	Electrical Engineering and Computer Science
Contact for Professor (Email, phone):	Email: Hossein@eecs.yorku.ca
# of positions available:	1
Project Description (200-500 words maximum)	<p>Over the past decade, brain electrical stimulation has been shown as an alternative solution for patients with neurological disorders who are refractory to drugs or brain surgery. However, electrical stimulation methods strongly suffers from lack of spatial resolution and specificity. Moreover, electrical stimulation is often five-to-six orders of magnitude larger than the field potential signals that could be used for detecting brain activity. This feed-forward cross-contamination pathway makes closing the electrical feedback loop challenging for both research and therapy systems.</p> <p>Optogenetic stimulation is a relatively new technological advance that may overcome the aforesaid limitations of electrical stimulation. The major benefit of optogenetic stimulation is the unprecedented specificity it provides, allowing spatial, temporal, and cell-type selective modulation of neuronal circuits. Equipped with such tools, it is now possible to begin to address some of the fundamental unanswered questions in neurological disorders such as epilepsy, to dissect epileptic neuronal circuits, and to develop new intervention strategies. Such specificity of intervention also has the potential for direct therapeutic benefits, allowing healthy tissue and network functions to continue unaffected.</p> <p>In Integrated Circuits and Systems Lab, we are developing a fully-implantable wireless neuro-stimulator IC (integrated circuit) to be used with micro-scale LEDs for optogenetic stimulation. While the IC is designed by a graduate student, a board-level prototype must be developed in parallel to characterize the envisioned solution using in-vitro experiments.</p>
Duties and Responsibilities of the student:	The successful candidate will be responsible of developing a board-level ontogenetic device using off-the-shelf electronic component and conducting its electrical and in-vitro characterization.

Summer 2018: LURA/USRA Projects

Skills and Qualifications:	<p>The student should have the following qualifications:</p> <ul style="list-style-type: none"> - Familiarity with electronic circuits and systems. - PCB design experience is a plus. - Self-driven and interested in the field of biomedical electronics
Degrees, courses and Disciplines prerequisite*:	<ul style="list-style-type: none"> - Minimum requirement: EECS 2200, 2210 or equivalent - Preferred: EECS 3611 and EECS3201 or equivalent
Stipend	TBD
Are you willing to host external students? (There is an additional cost.)	Yes
Duration:	16 weeks minimum
Start Date:	05/01/2018 (estimated)
End Date:	08/31/2018 (estimated)
Materials required for application:	TBC

**The projects will be available for viewing to students outside of Lassonde School of Engineering; please be clear what type of programs/pre-requisites are required for the projects.*