

Development of a Graphical User Interface for an Exercise Based Application

Summer student project for May-August 2018, supervised by **Dr. Kei Masani** and mentored by Pirashanth Theventhiran

Target Student Population(s)

Undergraduate student in computer science or computer engineering in years 3-4.

Brief Project Description

Functional Electrical Stimulation Rowing (FES-rowing) is a clinical rehabilitation exercise that has shown cardiovascular and musculoskeletal benefits in individuals with spinal cord injury. Our project involves developing an understanding for the coordination between upper and lower limbs during FES-rowing. After collecting the data from able-bodied individuals, we will develop an application to optimize coordination during rowing and test it during FES-rowing. **The proposed project requires the student to develop a graphical user interface for a rowing optimization application.** This application will respond to real time information on the seat and handle position and provide an output on when to administer the FES during FES-rowing to maximize the cardiovascular and musculoskeletal benefits.

Expected Learning Outcomes

Through this project, we expect you to learn the following-

1. Framing a research question
2. Effectively reading scientific literature to identify relevant and important features of current exercise related applications.
3. **Brainstorm ideas on what information to display, extra features and improvements to functionality.**
4. **Create a graphical user interface for the application.**
5. Writing scientific reports to report your developments and your findings.
6. Presenting your work to audiences from a diverse set of backgrounds.

Expected Research Outcomes

The summer student will be able to contribute to a current research project in the Rehabilitation Engineering Laboratory. We will be developing a graphical user interface for an application optimizing the coordination during rowing exercise. Every effort will be made to recognize the student's contributions to the research project and the journal and/or conference publications that come out of it.

Required technical Skills

- Mandatory skills: Previous coding experience in designing graphical user interface (GUI) for applications
- Optional skills: Previous experience developing exercise related applications or previous knowledge in biomechanics

Funding

Funding for this project may be obtained through competitive scholarship: [NSERC USRA and IBBME Director's Awards](#). It is the student's responsibility to apply in a timely manner, with the approval and assistance of their supervisor.

Application Details

To apply for this project, you must first complete the [IBBME USRP application](#) (Note: only need to do this once). Once you've don't that, please email your updated CV and a statement of intent to **Dr. Kei Masani (k.masani@utoronto.ca)** and to **Pirashanth Theventhiran (pirashanth.theventhiran@mail.utoronto.ca)**. Explain briefly why you are interested by the project and its outcomes, and why you would be a good fit for this project. Please also provide your latest transcript (can be unofficial) to help us assess your chances to obtain funding. The subject of your email should be *"Summer Student Application: Design of a Graphical User Interface for an Exercise Based Application."*