

Corollary Discharge in Individuals With Epilepsy

Summer student project for May-August 2020, co-supervised by Dr. Taufik A. Valiante, Dr. Jose Zariffa and mentored by Chaim Katz

Target Student Population(s)

Undergraduate student in Engineering, Neuroscience, Life Science in years 1-4. Preference will be given to students with prior experience with signal processing and programming experience.

Brief Project Description

A corollary discharge (CD) or efference copy is a brain signal that is considered a copy of a motor command. Such a CD is sent discriminate between internal and externally generated movements in the environment. We have suggested in our lab that eye movements may create a CD in memory related structures such as the hippocampus. There is some recent literature that suggests Alzheimer's Disease patients may have an impaired CD as indicated with reduced capability in a perception of direction of movement in a computer-based task. We would like to investigate if such an impaired CD exists in individuals with Medial Temporal Lobe Epilepsy who also have memory deficits. This type of information can lead to better understanding of different mechanisms within these structures that might lead to memory deficits. This project will involve significant interaction with people, designing and running behavioural experiments, exposure to data analysis through Matlab/Python.

Expected Learning Outcomes

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

1. Become comfortable with interacting with individuals with Epilepsy
2. Create and learn the basics of experimental design for behavioural tasks.
3. Learn the basics of neural data analysis.
4. Framing a research question.
5. Effectively reading scientific literature to identify the current state of the art.
6. Writing scientific reports to report your developments and your findings.
7. Presenting your work to audiences from a diverse set of backgrounds.

Expected Research Outcomes

Through this project, you will be contributing to an active research project in our laboratory and will be performing experiments, collecting and analyzing data that will be essential for future data collection for this project. Successful completion of the project will result in the student receiving an authorship in a journal publication and possibly in other conference publications as well.

Required technical Skills

- Prior experience working with running behavioural tasks.
- Programming experience in Matlab or Python other coding environment to create task
- Experience with reading and critiquing scientific literature (optional)

Funding

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

Application Details

To apply for this project, you must first complete the [IBBME USRA application](#) (Note: only need to do this once). Once you've done that, please email your updated CV and a statement of intent Dr. Taufik A. Valiante (taufik.valiante@uhn.ca) , Dr. Jose Zariffa (Jose.zariffa@utoronto.ca), and to Chaim Katz (chaim.katz@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: Corollary Discharge and Epilepsy"* .