Introduction to Computational Neuroscience

Winter Term 2022
Course Syllabus

Place and time: DeGrandpre Auditorium, MNI, Wednesdays 13:00-16:00
Coordinator: Christopher Pack
Neurology & Neurosurgery
Email: christopher.pack@mcgill.ca
Office hours: by appointment

Instructors: Curtis Baker, Maurice Chacron, Paul Cisek, Erik Cook, Daniel Guitton, Suresh Krishna, Bratislav Misic, Christopher Pack, Adrien Peyrache, Jesper Sjöström

Teaching Assistant: Yavar Korkian

OBJECTIVES: This course will present an introduction to computational neuroscience. Levels of analysis will span the range from dendrites and synapses to networks of neurons, with a particular focus on single-neuron models of sensory processing and motor control. Students will learn how to model the relationship between sensory stimuli and neuron activity, and between neuronal activity and behavior. These models will be introduced by the instructor in each lecture, and students will simulate the models during in-class programming labs. Basic mathematical concepts will be presented during tutorial sessions, and more advanced concepts will be covered during lectures.

ORGANIZATION: Each class will last three hours. The first part will be a formal lecture introducing an experimental observation along with a modeling framework. During the second part of the class, students will develop and/or modify Matlab code to perform simulations of the model under discussion. The last class will be devoted to presentation of students’ final projects.


GRADING: 50% weekly homework assignments, 50% final project.

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<tr>
<td>5 Jan</td>
<td>Dr. Erik Cook:</td>
<td>Reading: Chapter 5 of D &amp; A</td>
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<td>2022</td>
<td>Model Neurons:</td>
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McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/integrity/ for more information).

In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded.