

## **Noise in Neurons: A Key to Better Understand the Brain**

Grégoire Richard, Université de Moncton

Supervisor(s): Melanson, Alexandre

The brain is a complex organ made up of networks of interconnected neurons. These cells establish and maintain an electric potential difference, called the resting potential, between their exterior and interior environment. Because neurons are intrinsically noisy, the resting potential is in fact a highly fluctuating variable. When these fluctuations exceed a certain threshold, the neuron emits an action potential-electrical impulses that constitute the main communication signals within the brain. Inspired by experimental data, we use the formalism of stochastic differential equation to construct a toy model for this random generation of action potential. We further investigate this phenomena in the context of stochastic facilitation for information transmission.