Department of Mathematics and Statistics Colloquium

Investigating How Neurons Communicate Through the Power Series Method

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Abstract: Based on the physical conceptions and processes underlying the electrical activity of neurons, Hodgkin and Huxley created the first biophysical model for the giant squid axon. Their Nobel Prize winning work and ideology has helped shape our current understanding of single-neuron models and how they are approximated. The canonical numerical methods used to solve these models are Runge-Kutta and variants of it. Stemming from our mathematical curiosity in regards to dynamical systems and how we think, we have developed an algorithm using the Power Series Method (PSM) to improve the numerical solutions to the differential equations that describe these models. This talk will focus on the comparative studies of the PSM and Runge-Kutta methods, starting with a brief history of the neuron.

Monday, March 27 at 3:45 in Roop 103

Refreshments at 3:30