Derek Low

Senior Project Summary – Biology Poster

In the fields of computer science and computational biology, the topic of machine learning, or the capabilities of a computational system to learn without being explicitly tuned by a human, has long been considered a topic with great potential. Can we program computers to learn as humans typically learn, by performing some action and self-correcting based on whether or not the action produced the results we aimed for? Will computers be able to help researchers understand the complexity of the human brain, and how *exactly* neurons in the brain map to each other?

While we understand particular aspects of the brain, what remains a mystery is the general network structure of neurons, in both small and large populations. My senior project will heavily involve machine learning; I will be working on writing a machine-learning-inspired program to fit and replicate a network structure by training the program on simulated data of spiking neurons in a network. This project hopes to provide further insight into network structures of neurons under certain spiking patterns. Ultimately, the hope is to answer the question of how accurately I can drive a computational system to recreate neural networks by comparing the resulting spiking patterns of those networks.