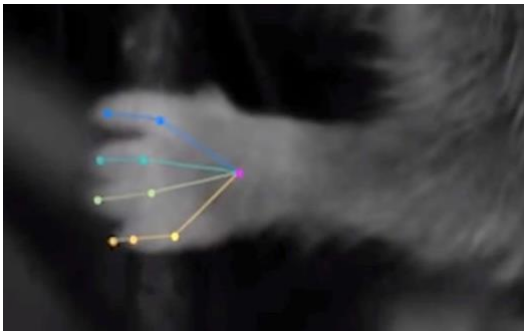
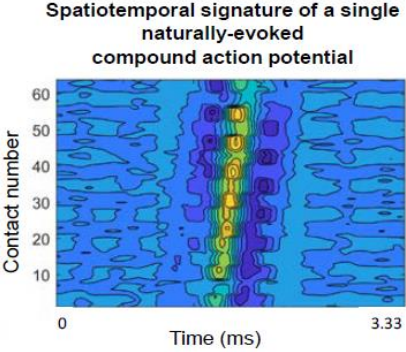


Project Proposed By:	Intelligent Sensory Microsystems Laboratory, Electrical and Computer Engineering, University of Toronto
Supervisor:	Professor Roman Genov
Project Title:	Estimating Rodent Pose using Computer Vision and Neural Signal Recordings (2 Positions)
Project Description:	<p>Our research group has been exploring ways to improve the correlation between peripheral nerve stimulation and the pose obtained by the animal as a result of that stimulation. This has an important application in bioelectronic medicine, neural prosthetics, and sensory restoration. One example of the most challenging and impactful applications for this is spinal cord injury.</p> <p>In this project we are looking to use Computer Vision, along with neural signal recordings from the animal to train a Machine Learning model for pose classification. This can facilitate the development of novel applications in bioelectronic medicine and neural prosthetics. By using the machine learning model to predict the pose of the animal based on the neural signal recordings, the system could provide artificial feedback or stimulation to the animal to restore or enhance its function or sensation.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Figure: Left: Example from DeepLabCut [1] for animal pose estimation. Right: Spatiotemporal signature of recorded neural signals</p> <p>We are seeking highly motivated students with strong expertise or interest in Machine Learning and Computer Vision to join our team. Students from background in EngSci, ECE or CS, with knowledge of the following tools and/or techniques are encouraged to apply.</p> <ul style="list-style-type: none"> • Familiarity with Computer Vision - DeepLabCut[1] toolbox. • Expertise with training & testing CNN and DNN algorithms in Software (knowledge of deploying algorithms on Hardware (on FPGA) is a plus, but not required). • Some expertise with correlating timeseries data and video data to generate training labels. • Proficiency with Python, and knowledge of basic signal processing concepts • The Candidate(s) must have a self-driven attitude, ability to debug and solve problems, and ability to work independently.
Contact Person:	Kindly reach out to Mustafa Kanchwala (mustafaa.kanchwala@mail.utoronto.ca) and Sudip Nag (sudip.nag@mail.utoronto.ca), copy to Prof. Roman Genov (roman@eecg.utoronto.ca). Please include your cover letter, resume and transcript (unofficial is ok)

[1] <https://www.mackenziemathislab.org/deeplabcut> - software package for animal pose estimation