Abstract: This dissertation proposal involves work on improving machine learning techniques on a physical, mobile robot. Developing a labeled training corpus for a skill based learning task can be difficult, given the need to run a large number of physical trials specifically for that task. Methods to address this problem which include semi-supervised learning and simulation, all have nontrivial drawbacks. I propose augmenting a small labeled dataset composed of physical trials with trials generated from a generative adversarial network (GAN) which has been trained on that dataset, then exploring how to build a robust machine learning architecture based on that premise. Preliminary work on a basic task, in particular, learning how to strike a ball towards a target, shows that the additional data generated by the GAN improves the performance of the robot.

Committee:

- Professor Simon Parsons, mentor, The Graduate Center
- Professor Jizhong Xiao, The City College of New York
- Professor Noson Yanofsky, Brooklyn College

Outside Member:

- Professor Oya Celiktutan, King's College London