Qian Luo

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EDUCATION

Georgia Institute of Technology, Atlanta, GA **08/2019-Present**
M.S. in Electrical and Computer Engineering (in progress) Advisor: Sehoon Ha
Huazhong University of Science and Technology (HUST). Wuhan, China **09/2015-06/2019**
B.S. in Electrical Engineering and Automation GPA: 3.8/4.0

PUBLICATIONS

Qian Luo, Maks Sorokin, Sehoon Ha, **A Few Shot Adaptation of Visual Navigation Skills to New Observations using Meta-Learning**, submitted to IEEE International Conference on Robotics and Automation (ICRA), 2021
Qian Luo*, Jing Wu*, Matthew Gombolay, **A Generalized Robotic Handwriting Learning System based on Dynamic Movement Primitives (DMPs)**, under submission (*: co-first author)

RESEARCH EXPERIENCE

Research Assistant at Graphics Lab, Georgia Tech **01/2020-Present**

- Built up robotic navigation baseline using Deep Reinforcement Learning based on Facebook Habitat platform, enabling the robot to navigate to a given target in indoor scenes
- Applied Model-Agnostic Meta-Learning (MAML) to learn the latent features between perception and inference networks, enabling the robot to navigate to new targets with new sensor configurations based on a few shots

Research Assistant at Bio-Interfaced Translational Nanoengineering Group, Georgia Tech **10/2020-Present**

- Classified different diseases based on electrocardiogram(ECG) and electroencephalogram(EEG) data collected by wearable devices using Convolutional Neural Networks (CNNs)
- (Ongoing) Train an adaptive neural network to classify unseen diseases with limited amount of ECG/EEG data, based on Meta Learning

INDUSTRIAL EXPERIENCE

Internship at MicroMultiCopter Aero Technology Co.,Ltd. **06/2018-09/2018**

- Used Mask R-CNN neural network to achieve real-time detection of 'the Blue Roof of Buildings' in the bird's eye view of quadrotor
- Studied the code (C++) of APM and PIXHAWK(open source flight control) framework, and built up the Hardware In The Loop (HITL) simulation environment for the quadrotor
- Improved the stability of the flight control system, by fusing dual antenna measurement into the state matrix of Extended Kalman Filter Algorithm

SELECTED PROJECTS

Multi-robot Formation Control and Collision Avoidance using Deep Reinforcement Learning

- Applied Deep Deterministic Policy Gradient (DDPG) algorithm in the Gatech Robotarium multi-robot simulation environment to enable the robots to achieve fixed locations while avoiding collision with other robots
- Applied Multi-Agent Deep Deterministic Policy Gradient (MADDPG) in the OpenAI Multi-agent environment to perform formation control(making the robots form a given shape)

Transient Prediction of Voltage Fluctuation in Power System based on Deep Learning

- Added neural network to DMD (Dynamic Mode Decomposition) algorithm to linearize the nonlinear system more efficiently
- Applied the method to power systems, analyzed the transient process to predict and control the voltage of certain nodes in a power grid with higher efficiency

TECHNICAL SKILLS

Programming Languages: C/C++, Python, Java, MATLAB
Machine Learning framework: TensorFlow, PyTorch, Scikit-Learn
Simulation Environment: OpenAI Gym, Mujoco, Facebook Habitat, Gatech Robotarium