YINGFU (BEN) MA

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EDUCATION

The Cooper Union for the Advancement of Science and Art New York, NY
Masters of Engineering in Mechanical Engineering, GPA: N/A *May 2020*
Relevant Courses:
Computational Graphs for Machine Learning Modern Control Theory Autonomous Mobile Robots
Industrial Robotics Artificial Intelligence Natural Language Processing Statistics Linear Algebra

The Cooper Union for the Advancement of Science and Art New York, NY
Bachelors of Engineering in Mechanical Engineering, GPA: 3.78/4.0 *May 2018*
Hillary and Eric Hirschhorn Cooper Fund Scholar, Bioengineering Research Scholars Program

PROJECTS & EXPERIENCE

Project - Occupational Therapy Salary Analysis *Summer 2020*

- Cleaned and analyzed OT survey data from OTSalary.com
- Applied statistical and permutation tests to confirm a gender wage gap within a subset of OTs
- Implemented and tuned an XGBoost model to predict salaries with gridsearch
- Deployed model onto Heroku as a Python Flask application

Project - Classifying Toxic Comments in Gaming Communities *Summer 2020*

- Gathered over 300,000 reddit comments from three major gaming subreddits with the Reddit Pushshift API
- Solved Jigsaw Toxic Comments Classification problem and applied transfer learning to the Reddit comments
- Chose optimal classification threshold based on ROC/AUC and ranked subreddits based on the results

Project - Path of Exile Currency Market Prediction *Summer 2020*

- Analyzed daily time-series data from the PoE in-game currency market starting from 2016
- Implemented a naive, moving average, and RNN-based prediction model and compared MAE
- Used the RNN-based model during the 3.12 Heist league (Fall 2020) to earn in-game currency

Deep Learning & Controls Research - Learning Model Dynamics for Controls Applications *Spring 2019*

- Optimized a neural network to learn input-output plant dynamics of QUBE Servo 2 rotary pendulum
- Implemented finite difference method to propagate gradients through ODE solvers with differentiable programming
- Showed comparable results between neural network performance to state-space LQR controllers

Deep Learning & Controls Research - Reinforcement Learning for Stabilizing Drone Controller *Fall 2018*

- Developed an end-to-end neural controller for aerodynamic quadcopter control
- Framed quadcopter stability task as a reinforcement learning problem
- Implemented Proximal Policy Optimization and designed task reward to optimize stability
- Combined learned policy with a PI controller as a boosted learner to control the quadcopter during a flip

Engineering Intern - Amber Agriculture Inc. - Shenzhen, China *Summer 2017*

- Designed housing for individual nodes of a sensor network for DFM (plastic injection molding) and DFA
- Wrote Python script to parse node data to record and plot packet data in real time
- Sourced components and materials for manufacture including electronic passives and MEMS sensors
- Conducted mechanical and electrical testing on components to pass UL and FCC certifications
- Communicated with manufacturer's engineers to optimize manufacturing process

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Presentations - TEDx Cooper Union Speaker (2017), iGEM (2015), MIT Eurekafest (2013)
Programming Languages - Python (*Jupyter/Google Colab, Tensorflow, Numpy, Pandas, Scikit, XGBoost, PyGAD, Matplotlib/Seaborn/Plotly, Flask*), SQL (*MySQL*), MATLAB/Octave, C/C++, HTML/CSS/JS
Skills - Git, Data Analysis, Visualization and Reduction (*PCA, t-SNE, K-means*), Machine Learning (*Deep Learning, Reinforcement Learning, Decision-trees, RF, GBM, & XGBoost, SVM, KNN, Linear & Logistic Regression*), A/B testing

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Tau Beta Pi - Engineering Honor Society *Spring 2018 - Present*
American Society of Mechanical Engineers *Fall 2014 - Present*
The Cooper Union Orchestra, *Co-President and Conductor* *Fall 2015 - Spring 2018*