Yilun Du

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Education

Massachusetts Institute of Technology, Cambridge, MA *August 2015 – Present*
Double Major in Computer Science and Engineering and Mathematics **GPA: 5.0/5.0**
Relevant Coursework (**past**): **6.172** (Performance Engineering), **9.520** (Statistical Learning Theory), **6.869** (Computer Vision), **9.660** (Computational Cognitive Science) **6.867** (Machine Learning), **6.854 (**Advanced Algorithms), **6.824** (Distributed Systems), **6.857** (Graduate Computer Network Security), **18.175** (Probability Theory), **18.701** (Intro to Abstract Algebra), **6.047** (Computational Biology), **6.437 (**Inference and Information Theory)

Work Experience

OpenAI, *Research Fellow* *July 2018 – Present*

- Research Fellow on the multiagent reinforcement learning team.
- Research on using deep energy based models for feature learning and image / trajectory generation.
- Research on emergent complexity in massive multiagent populations in persistent worlds.
- Research on using model based reinforcement learning and transferable models across environments.

Tenenbaum/Freeman Lab, *Research Assistant* *Jan 2016 – Present*

- Research on using stability to improve data efficiency and accuracy of 3D scene reconstruction
- Research on integrating a physics engine to infer density of objects from videos of objects falling in water

Facebook, *Software Engineering Intern* *June – Aug 2017*

- Constructed convolutional, recurrent and transformer architectures for text ranking and classification
- Integrated CTR, utility and relevance features predicted for post ranking and relevant snippet extraction

Teaching Assistant, *6.036 Machine Learning* *Aug 2017 – May 2018*

- Teaching assistant for undergraduate machine learning class.

Thomas Reuters Data and Innovation Lab, *Data Science Intern* *Jan 2017*

- Competed on FEIII challenge to predict relevance of extracted textual information from financial contracts of firms
- Tested various models of textual analysis (FastText, word embedding, GBDT), 2nd or 3rd place team in multiple categories

Study of Life (studyoflife.org), *Co-founder* *August 2014 – Present*

- Created online resource and tutoring center for students interested in *USA Biology Olympiad* at www.studyoflife.org

Projects

Deep Reinforcement Learning on Generals.io and Atari Space Invaders

- Trained a convolutional recurrent policy to play generals.io using supervised training data and through self play.
- Implemented Double Deep Q Networks (DDQN) and Dueling Q Network (DQN) on Atari Space Invaders

Homomorphic Encryption on K-means and Linear Regression

- Constructed privacy preserving K-means and linear regressions algorithms using homomorphic SEAL library at https://courses.csail.mit.edu/6.857/2017/project/9.pdf

Skills

- **Languages:** C++, C, Java, Python, Go, MATLAB, Lua, PHP, Javascript
- **Technologies:** PyTorch, Torch, Caffe2, Keras, Tensorflow, Caffe,

Publications

- **Yilun Du**, Karthik Narasimhan, *Learning Physics Priors for Deep Reinforcement Learning*,
- Joseph Suarez, **Yilun Du**, Philip Isola, Igor Mordatch, *Neural MMO: A massively multiplayer game environment for intelligent agents*
- **Yilun Du**, Igor Mordatch, *Generative Energy Optimization*, Bayesian Deep Learning Workshop at NIPS 2018
- **Yilun Du**, Jiajun Wu, Zhijian Liu, Hector Basevi, Ales Leonardis, Bill Freeman, Joshua B. Tenenbaum, *Learning to Exploit Stability for 3D Scene Parsing*, NIPS 2018
- Elizabeth Roman, Brian Ulicny, **Yilun Du**, Srijith Poduval, Allan Ko, Thomson Reuters' Solution for Triple Ranking in the FEIII 2017 Challenge, DSMM Workshop at SIGMOD, 2017
- Ilker Ylidirim, Jiajun Wu, **Yilun Du**, Joshua B. Tenenbaum, *Interpreting Dynamic Scenes by a Physics Engine and Bottom-Up Visual Cues*, AAVL Workshop at ECCV, 2016
- **Yilun Du**, Sergiy Merenkov, *Tiling Harmonic Functions*, JMM Undergraduate Research Conference, 2015

Awards

- International Biology Olympiad Two Time Gold Medalist