Yilun Du

500 Memorial Drive, Cambridge, MA 02139 • yilundu.github.io • (307) 399-6339 • yilundu@mit.edu • Birthdate 01/29/1997

Education

Massachusetts Institute of Technology, Cambridge, MA *August 2015 – Present*

Double Major in Computer Science and Engineering and Mathematics **GPA: 4.92/5.00**

Relevant Coursework (**current**): **6.824** (Graduate Distributed Computing Systems), **6.857** (Graduate Computer Network Security), **6.033** (Computer System Engineering), **18.650** (Statistics)

Relevant Coursework (**past**): **6.867** (Graduate Machine Learning), **6.854** (Advanced Algorithms) **6.148** (Web Development Competition), **18.600** (Probability and Random Variable), **18.701** (Intro to Abstract Algebra), **6.005** (Introduction to Software Architecture), **6.047** (Computational Biology), **6.004** (Computational Structures), **6.046** (Algorithm Design and Analysis)

Work Experience

Thomas Reuters Data and Innovation Lab, *Intern* *Jan 2017- Feburary 2017*

- Worked on FEIII challenge to predict relevance of extracted textual information from financial contracts of firms
- Constructed a Word2Vec embedding of text. Added financial context features and trained random forest model.

Tenenbaum Lab, *Research Intern* *Jan 2016 – Present*

- Built a generative probabilistic physics engine based model to estimate parameters of objects from dynamical scenes.
- Extracted positional information from videos using KLT tracker/GMM.
- Created OpenGL visualization of simulation of scenario and MCMC sampling to compute posterior distribution.
- Resulting estimated labeled parameters used to train CNN to transfer learning to static scenes.
- Constructed a CNN to estimate keypoint/depth maps/surface normal of objects from pictures for internal representation. Used resulting internal representation to estimate voxels of object

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

- Constructed a Node.js website to log tutor and student lessons and automate finances using Paypal API.
- Created, designed and ran a blog, resource center, and tutoring service for students wanting help in biology classes or interested in participating in biology competitions such as the *USA Biology Olympiad* at www.studyoflife.org

Tiling Harmonic Functions, MIT PRIMES-USA, *Research Intern* *June 2014 – August 2015*

- Proved an analog of Louiville's Theorem for tiling harmonic functions. Constructed a gradient descent algorithm to efficiently calculate tiling harmonic functions in C++.

Projects

Deep Reinforcement Learning on Atari Space Invades

- Implemented Double Deep Q Networks(DDQN) and Dueling Q Network(DQN) on Atari Space Invaders through Keras/Tensorflow and OpenAI Gym. DQN achieved approximate scores of 300 points. Blog post at yilundu.github.io

Kaggle Samtender Recommendation System

- Constructed time based recommender system using models including user based collaborative filtering, gradient boosted trees, neural networks and HMM. Best submission(gradient boosted trees) in top 30% of submissions.

Overlaps

- Meteor application allowing users to register and create fun classes to others through Google Maps and Venmo APIs.
- 3rd Place at the MIT IAP Web Development competition with over 60 different teams

SplitPlay

- Constructed web app using Flask and Meteor which scans receipts and parses receipts through OCR
- App won the Rough Draft Ventures Award at HackMIT

Skills

- **Machine Learning:** Matlab, Numpy, Matplotlib, Scikit Learn, Caffe, Torch, TensorFlow, Keras, XGboost, CVXopt,, Seaborn, Pandas, IPython, Lua, Gensim, NLTK
- **Web Development Skills:** MEAN stack, Handlebars, Jquery, Bootstrap, CSS, Meteor, Flask/other web frameworks
- **General:** Familiarity with Linux, bash scripting, SLURM, GNU tools/Make, Familiarity with C++, Java, Python, Javscript

Publications

- **Yilun Du**, Ilker Ylidirim, Jiajun Wu, 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
- United States Physics Olympiad Gold Medal