Mobile: +1 908 670 8612
Email: ypatel5400@gmail.edu

YASH PATEL

GitHub: yashpatel5400
Website: ypatel.io

EDUCATION

Princeton University – A.B. Mathematics — Sep 2014 – June 2018
Certificates in Applications of Computing (1), Statistics and Machine Learning (2)
Highlighted Coursework

- Theoretical ML (Graduate)
- Fairness in ML (Graduate)
- Machine Learning/Pattern Recognition (Graduate)
- Neural Networks: Theory & Applications
- Theory of Algorithms
- Analysis of Big Data
- Computer Vision
- Computer Graphics
- Probability/Stochastic Systems
- Topology
- Real Analysis
- Complex Analysis

Departmental GPA (MAT) - 3.725/4.0 / Overall GPA - 3.642/4.0

WORK EXPERIENCE

Facebook Inc — Summer 2018 – Present
Computer Vision/Graphics Engineer
Ongoing (2020-)

- Implemented real-time TSDFs scene reconstruction using KinectFusion in C++/OpenGL

Portal (2019)

- Implemented, optimized, and trained deep learning model for deployment on Portal platforms. Model was implemented in PyTorch and optimized via SNPE, quantization with QAT, and layer fusion to run at 30 FPS on Qualcomm SoC.
- Added support to PyTorch library for translation from JIT compiled PyTorch graphs with quantized nodes to Caffe2.

Manifold (2018-19): https://research.fb.com/wp-content/uploads/2019/09/An-Integrated-6DoF-Video-Camera-and-System-Design.pdf

- Added ability to render on arbitrary computer farm (local or AWS cloud) through Docker, RabbitMQ, and Kubernetes.
- Created test suite for open source release, extending coverage from ~0% to 100% of binaries. Deployed with Travis CI.

Amazon.com — Summer 2017
Software Engineer

- Developed debugging service for Kiva Picking Optimization (Amazon team) developers. Deployed globally to all Amazon Robotics-enabled fulfilment centers. Implemented in Java with Spring MVC. Deployed on AWS (EC2, S3, SNS/SQS, DDB)

SELECTED RESEARCH

Deanonymizing Bitcoin Transactions: An Investigative Study on Large-Scale Graph Clustering
Senior Thesis 2018 (under *Professor Matt Weinberg*): https://yashpatel5400.github.io/files/deanonymization.pdf

- Investigated the prospects of partially deanonymizing Bitcoin transactions using graph clustering algorithms on a heuristics graph constructed atop the standard BTC transactions graph. Discovered hierarchical spectral clustering and METIS to have the best performance as measured by F-score, NMI, and purity, after which several BTC wallets were identified.

An Analysis of Selfish Mining Attacker Incentives in Bitcoin and Ethereum
Junior Independent Work 2017 (under *Professor Matt Weinberg*): https://yashpatel5400.github.io/files/selfish.pdf

- Studied the viability of selfish mining attacks in mining pools as an extension to "Majority is Not Enough: Bitcoin Mining is vulnerable" (Eyal) by taking price adjustments into account. Discovered selfish mining was viable for BTC/ETH through 2017.

Investigating the Efficacy of Coach Programs for Sexual Minorities
Summer Research Project 2015 (at Mailman School of Public Health, Columbia University under *Professor Abdulrahmen El-Sayed*)

- Developed agent-based mathematical models for understanding the dynamics of self-efficacy for sexual minority populations from enrollment in exercise coach programs. Simulated dynamics in Python using Matplotlib, Numpy, and NetworkX

SELECTED PROJECTS

FairTear, (Fairness in Machine Learning: COS 597E): http://fairtear-demo.herokuapp.com/ — Fall 2017
Report: https://yashpatel5400.github.io/files/fairtear.pdf

- Probabilistic fairness checker on hidden variables in machine learning models. Interfaces with decision trees, SVMs, and basic MLPs from scikit-learn. This work was an extension of Fairsquare (https://dl.acm.org/doi/pdf/10.1145/3133904).

Synalyze, (Best Use of Machine Learning: HackPrinceton 2017): https://github.com/yashpatel5400/synalyze — Spring 2017

- Business meeting-centric application for analyzing pain points and how to improve upon them. Produces analytics on voice audio recordings of business meetings using Watson NLP API. Implemented in Python/Ruby on server-side.

NeuroPath, (Great Moments in Computing: COS 583): https://github.com/yashpatel5400/neuropath — Spring 2017

- Implemented two neural branch predictors (single neuron and path-incorporating network) in x86 Gem5 emulator environment. Compared with performance with standard BPs, such as Tournament and LTAGE, finding increased latency. This work was an extension of "Fast Path-Based Neural Branch Prediction" (Jimenez) to the Gem5 x86 setting.