William Wong

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Education

8.2021 – Present: *Carnegie Mellon University* M.S. in Machine Learning

8.2017 – 5.2021: *University of California, Berkeley* B.A. Computer Science

Relevant courses: Machine Learning, Artificial Intelligence, Deep Learning, Robotics, Algorithms, Data Structures, Security, OS, Architecture

Skills

Languages and Libraries: Python, Java, PyTorch, TensorFlow, JavaScript, C, Golang, Node.js, React, SQL, gym, NumPy, pandas.

Tools: Git, bash, Docker, AWS, MongoDB, Heroku, Flask, Google Cloud, Vim, Postman, Ubuntu, MacOS, Windows.

Publications

- *Simulating Polyculture Farming to Tune Automation Policies for Plant Diversity and Precision Irrigation.* Yahav Avigal, **William Wong**, Mark Presten, Mark Theis, Shrey Aeron, Anna Deza, Satvik Sharma, Rishi Parikh, Sebastian Oeheme, Stefano Carpin, Joshua H. Viers, Stavros Vougioukas, Ken Goldberg. **T-ASE 2022**.
- *Learning Seed Placement and Automation Policies for Polyculture Farming with Companion Plants.* Y. Avigal, A. Deza, **William Wong**, S. Oehme, M. Presten, M. Theis, J. Chui, P. Shao, H. Huang, A. Kotani, S. Sharma, M. Luo, S.C., J.V, S.V, K. Goldberg. **ICRA 2021**.
- *Simulating Polyculture Farming to Tune Automation Policies for Plant Diversity and Precision Irrigation.* Y. Avigal, J. Gao, **William Wong**, K. Li, M. Theis, M. Preston, G. Pierroz, F.S. Deng, K. Goldberg. **CASE 2020**. **Best Student Paper Winner**.

Experience

8.2021 – Present: ***Machine Learning Department**, Carnegie Mellon University*

Graduate Researcher advised by Professor Zack Lipton

- Investigating risk sensitive reinforcement learning, supervised learning, and off-policy evaluation in safety critical applications.

5.2021 – 7.2021: *Amazon Lab126, Sunnyvale, CA*

Software Development Engineer Intern

- Researched and developed human-robot interaction as part of a version one stealth consumer device team.
- Trained neural networks in PyTorch, used kernel density estimation, and Bayesian statistics to create tailored user experiences.
- Implemented ability to acquire real time feedback from customers to actively learn optimal behaviors.
- Sped up computation of device behavior planning components by 600%.

10.2018 – 6.2021: *Berkeley Artificial Intelligence Research Lab, Berkeley, CA*

Undergraduate Researcher advised by Professor Ken Goldberg

- Co-Author ICRA 2021: *Learning Seed Placement and Automation Policies for Polyculture Farming with Companion Plants.*
- Co-Author CASE 2020 Best Student Paper: *Simulating Polyculture Farming to Tune Automation Policies for Plant Diversity and Precision Irrigation*.
- Discovered and applied autonomous agricultural robot policies using imitation learning and deep reinforcement learning.
- Created CNN architectures to train deep neural network policies that ran 1500x faster than previous agriculture policies.
- Decreased water usage by 93% and increased crop yield by 25% with new policies over drip irrigation policies.
- Experimented with GANs and attention-based Mask R-CNN for plant key-point identification for domain adaptation.
- Spearheaded development of first order polyculture garden simulator that runs 25000x faster than real life.
- Partnered with Lawrence Berkeley Hall to train a neural network and SVM classifiers for robotic workbench decluttering.

1.2021 – 4.2021: *Prefix Software Inc., Los Altos, CA*

Consultant

- Built Node.js and Electron based desktop activity monitoring tool for robot process automation (RPA) opportunity discovery.
- Created novel sequence identification algorithms for repeated desktop and browser activities.
- Developed a full-stack application which collects, aggregates and surfaces RPA metrics using a Vue.js, Node.js and PostgreSQL stack.

6.2020 – 8.2020: *Amazon Lab126, Sunnyvale, CA*

Software Development Engineer Intern

- Researched and developed human-robot interaction as part of a version one stealth consumer device team.
- Improved customer interactivity by 12x through new autonomous features that respond to real time user actions and feedback.
- Speed up computation of device motion planning components by 500%.
- Allowed instantaneous software updates for all devices by implementing a remote device configuration on AWS.

5.2019 – 8.2019: *Google, Mountain View, CA*

Software Engineering Intern

- Deployed an end-to-end solution that allows for the collection, storage and surfacing of server test metrics and metadata.

- Created a Flume Java pipeline that queries, sanitizes and aggregates 1 to 3 million rows of server test data daily.
- Designed a Spanner database such that data stored and queried is 100% accurate in lieu of possible daily pipeline failures.
- Built an RPC query service by creating 3 Golang and Java servers to retrieve metrics for individual servers and global server rankings.
- Created 2 Wiz JavaScript controllers in 2 days to call RPC methods and display responses on dynamically generated pages.

6.2018 – 8.2018: *Proteus Digital Health, Redwood City, CA*
Software Engineering Intern
- Reduced Atlassian Confluence and EtQ Reliance workflows by 66% with custom REST APIs in Java and JavaScript.
- Developed Java REST framework to handle secure communication with EtQ Reliance Apache server in less than 1 second.
- Created a Java Confluence web plugin to automate generation of redline Microsoft Word documents, using the docx4j library.
- Developed Python scripts with Requests library to call EtQ Reliance REST APIs.

5.2018 – 7.2019: *Vectorspace AI, San Francisco, CA*
Staff Engineer
- Utilized SVM, LDA, K-Means and t-SNE for machine learning modeling to create cryptocurrency ETFs based on hidden relationships.
- Created REST APIs for large scale data mining, a live NLP build log, and the company website using JavaScript and Node.js.
- Developed Ethereum smart contracts for subscription platform and 50 million cryptocurrency tokens listed as VXV.

7.2017 – 8.2017: *SDxCentral, Santa Clara, CA*
Data Analysis Intern
- Created the company's first user data backend by uploading over 60,000 lines of data from csv files onto a Heroku PostgreSQL database with Python.
- Established a data platform for company to use to tailor site experience to specific users, countries and organizations, resulting in increased profitability.
- Developed data visualization website with full stack Ruby on Rails in 3 weeks to serve as a more versatile alternative to company's Google Analytics backed portal.
- Utilized PostgreSQL to generate multiple queries connecting website with database - all within 2 seconds.
- Self-initiated 7 data analysis projects to maximize consumer experience. Added analysis based on user, report, and region.

6.2017: *Ambisafe, San Francisco, CA*
Software Engineer
- Built a CLI application in 2 weeks with Web3.js and Node.js to automate sending of Ethereum ERC-20 tokens to investors.
- Upgraded ICO token sale mobile apps with React Native and Git by fixing critical bugs and adding new features.
- Became proficient with Web3.js in less than 3 weeks and used it to program a token sender.

7.2016 – 8.2016: *Carleton College, Northfield, MN*
Computer Science Research Intern
- Conducted gap analysis and logistical regression study for endangered Blanding's turtle conservation in Minnesota.
- Used ArcGIS and Python to generate models for geospatial analysis research.

6.2015 – 8.2015: *Cafetalk, San Francisco, CA*
Web Developer Intern
- Revamped all the help pages using HTML and CSS in 2 months.
- Established more than 10 advertising partnerships with internet language bloggers.
- Managed job openings for tutor positions and contacted over 200 applicants.

1.2014 – 11.2014: *Cooliris, Palo Alto, CA*
Software Engineering Intern
- Developed 5 Objective-C iOS apps including a Firebase chat application to research features for Cooliris' production apps.
- Conducted hundreds of quality control tests of company's mobile apps and compiled daily lists of UI and feature suggestions.
- Worked closely with PR team to release 2 blog updates on company's blog and generate 15 social media ad campaigns.

Selected Independent Projects
- **Yelp Rating Prediction 2.2021 – 5.2021**: Created NLP Bert architectures to predict Yelp review ratings with over 70% accuracy.
- **Assembly Line Stopping and Sorting Robot 10.2019 – 12.2019:** Used a Baxter robot, ROS and OpenCV to identify objects on an assembly line to stop and sort objects. Used MoveIt for motion planning and AR tags for localization.
- **DashOwl (AI Dashcam) 11.2018 – 3.2019:** Mentored by Google Cloud and TensorFlow for case study. Crowdsourced dash cam footage for car crash analysis. Determined if footage captured was a crash by training a convolutional neural net running on Compute Engine. Uploaded data to Google Cloud Storage and Firebase. Built a web portal with JavaScript for crash searching.
- **Cal Hacks 2017:** Singlehandedly built a blockchain inventory record keeping app for small businesses to prevent fraud.
- **Tabt 2016-2017:** Published an iOS Swift app to outsource time management to friends. Achieved 2400+ downloads.

- **HS Hacks 2017 Best Beginner Hack:** Created a website platform for crowdsourcing travel guides.
- **Los Altos Hacks 2017:** Created a sign language-to-speech translator using Leap Motion hand gesture recognition. Developed an Amazon Alexa skill deployed to AWS with a Heroku backend, integrated using Node.js.