Harrison Zhao

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EDUCATION

- **Cornell University** — New York, NY
  Masters of Engineering in Operations Research; GPA: 3.9 — *May 2018*
  Relevant Courses**:** Applied Machine Learning, Optimization, Natural Language Processing, Computer Vision
- **University of California, Irvine** — Irvine, CA
  Bachelor's in Mathematics; GPA: 3.8 — *March 2017*

SKILLS

Programming: Python (sklearn, pandas, geopandas, nltk, matplotlib, plotly dash, spark-sklearn), R, SQL
Optimization: CPLEX, Gurobi, CBC, Pulp, Glop
Deep Learning: PyTorch, Tensorflow, Keras, CoreML
Deployment: Domino Data Lab, AWS (Sagemaker, S3, EC2, ECR), Docker

EXPERIENCE

- **Bayer Crop Science** — St. Louis, MO
  Data Scientist — *Jun 2018 – present*
  Built a two-stage (prediction and optimization) model for plant field-testing allocation.
  - Designed a recurrent neural network (Bi-LSTM) to predict allocating preference for each testing materials. Used the predicted preference to guide optimization model and reduced solving time from 30 mins to 5 mins.
  - Built a large-scale (~ 160k decision variables) mixed integer model with CPLEX to optimize allocations according to business rules and field-testing objectives.
  - Delivered allocations of 1.2 million plots across North America. Improved metrics on maturity matching, environmental diversity by 11%. Automated the entire application through Domino and AWS.

  Implemented a prediction model that uses genetic markers to predict plant phenotypes (eg. yield, plant height).
  - Built a 1-D convolutional neural network to handle large number of features in genetic marker data and achieved 0.3 – 0.5 correlations on the major phenotypes.

- **OptiFunder** — St. Louis, MO
  Lead Optimization Scientist — *Dec 2018 – July 2019*
  Designed a smart loan funding model from scratch that provides optimal strategies to warehouse lenders.
  - Worked directly with the founder to understand loan business. Built an optimization model that can save 30% - 40% cost for warehouse lenders. The product has been sold to four warehouse lenders.

- **Cornell Tech** — New York, NY
  Graduate Research Assistant — *Jan 2017 – May 2017*
  Worked with PHD students to enable natural language navigation for simulated drone.
  - Built a recurrent neural network with self-attention mechanism for language embedding. Enabled the system to better capture key words in the natural language queries. (link)

PROJECTS

- **Simulated Self-Driving Car**, Udacity
  Built an autopilot program in a simulator with Tensorflow and trained on AWS EC2.
  - Implemented Nvidia self-driving architecture to train a convolution neural network model with 40,000 driving images to predict steering angle.
  - The trained model is able to drive smoothly in a simulated mountain track. (link)

- **Plant Disease Detection IOS App**
  Developed an IOS app that can predict plant disease by taking pictures of plant leaves.
  - Trained a CNN model with 20k images across three different plants. Integrated the trained model into an IOS app that can predict plant disease in real time. (link)

Other projects: Airline Pricing, Image Search Engine, nonMNIST, House Prices, Sentiment Analysis