

ANISH DOSHI

MACHINE LEARNING ENGINEER

anishpdoshi@gmail.com

linkedin.com/in/anish-doshi-45a81271

github.com/anishpdoshi

Education

MEng, ELECTRICAL ENGINEERING AND COMPUTER SCIENCE | UC BERKELEY

AUG 2021 - MAY 2022

PROGRAM SYNTHESIS | NLP | FORMAL METHODS | CONVEX OPTIMIZATION | VIDEO ML | HUMAN-CENTERED PROGRAMMING

B.Sc., ELECTRICAL ENGINEERING AND COMPUTER SCIENCE | UC BERKELEY

AUG 2013 - MAY 2017

MACHINE LEARNING | ALGORITHMS | COMPILERS | DEEP LEARNING | OPERATING SYSTEMS | PROBABILITY

Experience

SENIOR MACHINE LEARNING ENGINEER | ∞ Meta | October 2022 - Current

- Tech lead on music ranking in ads. Designed + tested variations of multi-arm bandit algorithms, embedding based song retrieval, and user-level targeting. Broader roadmap alignment, stakeholder requirements, mentorship, and surfacing direction for next steps.
- Launched a controllable image layout positioning algorithm with OpenCV/torch/C++ and tested automatic text placement optimization in ads.

FUNG FELLOWSHIP GRADUATE STUDENT RESEARCHER | UC Berkeley | July 2020 - July 2021

Advised by Professor Dawn Song. Masters focus in machine learning, program synthesis, and HCI.

- Capstone Project: Interactive neural SQL synthesis from Diverse Specifications. Deployment of NL2SQL models and finetuning of OpenAI Codex on SQL datasets, automatic prompt tuning from user interactions, formal verification and fixing of output SQL, neural ranking of generated variants with user-code interaction features, webapp development, [user testing](#), and [demo](#). Project earned a top 10% grade (A+) in graduating class.
- Course project: designed and implemented [novel symbolic regression approach](#) and implemented to solve formal synthesis problems in the presence of black box optimizers over arbitrary grammars.

MACHINE LEARNING ENGINEER | 🍏 Apple | July 2020 - July 2021

- Designed and developed a credit card transaction tagging system for Apple Wallet which shipped to 3+ million users.
- Developed modeling approach to multi-label transformer model in Tensorflow to predict sets of semantic tags to be added to credit card transactions. Wrote pipeline to quantize and compile models to CoreML, and automatically re-train them on-device with Swift.
- Reduced memory footprint for Wallet's intelligence framework by 50% (12MB -> 6 MB) over several releases through SQLite optimization.

SENIOR MACHINE LEARNING ENGINEER | 🌈 Trifacta | October 2019 - March 2022

- Tech lead for ML powered data wrangling at Trifacta. Worked closely with product and design to define the ML roadmap over 2 years of releases; helped validate feature success with user studies and analytics. Mentored 4 interns in developing machine learning features.
- Led 4-person team in developing Trifacta's *Transform By Example* feature, using regexes, graph algorithms, and logistic regression [[blog post](#)] [[conference talk](#)].


cont.

- Designed and developed a collaborative recommendation system for data transformation programs: feature mining from datasets, neural autoencoders for representation, indexing via Postgres similarity search, and integration of a completed model and architecture into a Javascript frontend with the ONNX.js library. [[blog post](#)]

MACHINE LEARNING ENGINEER II |  Trifacta | July 2018 - October 2019

- Lead engineer on RapidTarget, an interactive tool to align table schemas. Designed and implemented dynamic programming algorithms to generate the minimum number of sequential move statements needed to move columns of data to match a target schema. [[blog post](#)]

SOFTWARE ENGINEER I

 Trifacta | July 2017 - July 2018

- Built a pipeline to log user interactions, import them into a Python backend, and featurize them with Pandas. Evaluated regression models in sklearn and feedforward neural networks in Tensorflow for accuracy and feature explainability.

Research

[[biorxiv](#)] Doshi, Anjali, Marian Shaw, Ruxandra Tonea, Soonhee Moon, Rosalía Minyety, **Anish Doshi**, Andrew F. Laine, Jia Guo and Tal Danino. "Engineered bacterial swarm patterns as spatial records of environmental inputs." *Nature Chemical Biology* (2023): 1-9.

Fine tuned image models (ResNet, Inception v3) in TensorFlow to classify bacterial colonies and used integrated gradients for interpretable petri dish segmentation using integrated gradients and Captum.

[[arxiv](#)] Cai, Wilson, **Anish Doshi** and Rafael Valle. "Attacking Speaker Recognition With Deep Generative Models." *ArXiv abs/1801.02384* (2018): n. pag.

Generated fake audio using Wasserstein GANs applied to mel-spectrograms of human speech using a novel triplet loss function, and validated that GAN generated audio could fool state of the art CNN based speaker recognition models.

[[arxiv](#)] Valle, Rafael, Wilson Cai and **Anish Doshi**. "TequilaGAN: How to easily identify GAN samples." *ArXiv abs/1807.04919* (2018): n. pag.

Empirically showed that samples generated from several GAN architectures smoothly approximate modes of the true distribution; provided strategies to statistically and visually differentiate true samples from synthetic.

[[workshop](#)] **12th International Conference on New Directions in the Humanities** | June 2014

Statistical NLP techniques to analyze the co-occurrence of gendered terms in the Bible.

Patents Pending:

20230095944: [TRANSACTION TAGS FOR ENHANCED SEARCHING](#)

20230101449: [TRANSACTION TAGS FOR ENHANCED SUGGESTIONS](#)

20230093873: [GENERATION OF TRANSACTION TAGS FOR ENHANCED SEARCHING](#)

Talks

BUILDING A PROGRAMMING BY EXAMPLE FRAMEWORK IN TRIFACTA | [DataCouncil.ai](#) | March 2019

Conference talk on challenges, interpretability considerations, and current research on programming by example.

Primary Skills

Skills	Languages	Environments/Tools	Libraries
Machine Learning	Python, C++	Unix, Git, Docker,	PyTorch, Tensorflow, JAX, sklearn,
Full Stack Engineering	Java, Scala	AWS, CUDA, Bash	NumPy, pandas, matplotlib,
Language Modeling	JS, Swift		PostgreSQL, SQLite3, Spark

Volunteer Experience

CRISIS COUNSELOR | [Crisis Text Line](#) | May 2020 - Present

- Crisis Text Line is a nonprofit which provides free, 24/7, text-based mental health support for people in need.
- Trained to listen to texters in their most difficult moments, provide them with a measure of calm, and work with them on a plan to stay safe and healthy.

DIRECTOR OF INFORMATION TECHNOLOGY | [Young Jains of America](#) | September 2017 - September 2018

- Director of Technology for an organization with over 2,000 members. Launched the website, registration flow for a 800+ attendee convention, and the official mobile app, with over 700 downloads at release (React Native, PHP, MySQL). Evangelized creative ways to use technology to grow membership and interact with members.

Other Projects

PART-OF-SPEECH WEIGHTED LANGUAGE MODELING | [\[github\]](#)

Analysis of using POS tagging as pseudo labels for language models language models. **PyTorch, nltk, spacy**

DEEP Q LEARNING TO SOLVE CIRCLE THE CAT | [\[github\]](#)

Deep Q-Learning to solve a discrete flash game called circle the cat. Reimplemented the game in React, used REINFORCE.js to encode state, action, and network, and implemented an interface to analyze and store various runs of the model.

REINFORCE.js, React.js