



Jack Daniel Reilly

Data scientist, data engineer, researcher, entrepreneur with a passion for mapping, geographical data, and machine learning at scale.

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Education

2009-2014 **PhD, Civil Systems Engineering;** UC Berkeley

- **Thesis: Security of Freeway Traffic Systems: A Distributed Optimal Control Approach**
- **academic page** • 12 h-index
- **2014 Milton Pikarsky Memorial Award for Top US Transportation Ph.D.**

2005-2009 **BSc, Civil Engineering;** UCLA

Experience

Google Maps Machine Learning

Senior Software Engineer Tech Lead - 2014-2018 - Google - Mountain View, CA, USA

- Designed and deployed deep learning models at “Google scale” to extract mapping data from the world’s satellite imagery fused with geographical data, improving routing and travel time estimates for billions of users.
- Led, designed, and implemented Google’s first high-definition, self-updating road altitude dataset, instrumental in securing data deals with carmakers. This required data fusion, deep learning, model-driven optimization, visualization, and automated quality metrics to go from conception to launch.
- Miscellaneous:
 - LSTM-based model to automatically detect fraudulent businesses on Google Maps
 - Deep segmentation model to extract water body polygons from satellite and infrared imagery.

Taste Social

Cofounder and CTO - 2019-2020 - Paris, France

- Cofounded Taste to make a social-first food **discovery platform**.
- Designed, built and launched **iOS, Android, Web** MVP in 3 months
- Fully serverless architecture, modern, reactive front-end

Bluecanvas

Source control SaaS consultant - 2019

- Designed Kubernetes stack to scale infrastructure with increased userbase

- Migrated ad-hoc scheduling to tenant-isolated pods, with autoscaling
- Graphene+Prometheus monitoring solution
- Load balancing and networking across internal and external tools
- Designed and launched full-stack SaaS features, including DB, server, integration, front-end, testing, batch-processing

Google Maps Traffic Estimation

Software Engineering Intern - 2013 - Zurich, Switzerland

- I improved travel time estimations for directions on Google Maps by employing unsupervised Machine Learning clustering
- The discontinuity of travel times due traffic's complexity makes naive approaches to travel time imputation inaccurate. I used unsupervised clustering techniques to identify discrete jams, and inferred per-jam travel times, leading to significant improvement in estimations, and enabling the tracking of jams as distinct semantic elements in Google's backend.

PhD in Traffic Modeling and Optimization

At UC Berkeley, I developed model-based optimization and machine-learning methods for large-scale freeway networks. Based on distributed optimization ADMM techniques and discretized PDE networks, I developed a novel, decentralized model-based online controller for freeways, which enables the optimization of arbitrary objective functions. This allows city planners to devise complex goals for freeways which balance fairness and efficiency, or allow them to whimsically **draw the CAL logo with car congestion**.

Skills

by proficiency, over 11 total years, 6 years professional

Python • ML/Deep Learning • Java • Optimization • Mapping • Computer Vision • Big Data/Spark • C++ • Dart/Flutter • Git • Bash • Linux/OS-X • Java-/Typescript • Firebase/Firestore • Serverless • Protobufs • SQL • GCP • Docker • Tensorflow • Routing/Networks • Pandas • sklearn • Golang • Unit Testing • CI/CD • Prometheus • Kubernetes • AWS • GraphQL • Postgres/PostGIS • Reactive UI (React/Flutter) • Latex

Personal Interests

Traveled the world and volunteered for a year • Guitarist, Pianist • Acro Yoga • Runner • Jazz/Funk • Biking • Tennis • NBA • Swing Dancing

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