Zach Siegel

Mathematics, Education

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Education

University of California, Los Angeles

Decisions, Operations, and Technology Management *Ph.D. at the Anderson School of Management. Fall 2019-Current.*

Pomona College

BA in Mathematics, 2014. Computer Science minor. GPA 3.63.

Indian Institute of Technology, Kanpur

Mathematics Department, spring 2013.

Research

Fairness, Efficiency, and Feature-Awareness in the Allocation of Public Goods

UCLA - Decisions Operations and Technology Management *2020*

Extends strategies for algorithmic fairness from the machine learning community in order to achieve fair outcomes in a resource-allocation optimization setting.

Predictive Policing in Los Angeles

2017

Stop LAPD Spying Coalition, LA Community Action Network

Implemented LAPD's "hotspot"-generation algorithm. Compared hotspots to historical arrest, citation, and crime report data from the City of Los Angeles. Collaborated with GIS specialist to visualize time-varying hotspots in an interactive map using ArcGIS. Contributed results the community-generated report entitled "Predictive Policing in Los Angeles".

Generative Models and Sparse Coding

2014

Department of Mathematics, Pomona College

Formalized connections between the Boltzmann Machine Distribution and state-of-the-art unsupervised learning techniques based on sparse coding.

Anomaly Detection Using Dictionary Learning

2013

University of Minnesota, Minneapolis

Unsupervised anomaly detection in video data using dictionary learning and sparse coding. An NSF-funded REU.

Aquatic Insect Populations' Response To Time-Varying Reproductive Rates

2012

Oregon State University

Modeled insect populations in MATLAB using partial differential equations. Developed field data collection methodology to study model accuracy. An NSF-funded REU.

Zero-Sum Flows of the Linear Lattice

2012

Department of Mathematics, Pomona College

Proved conditions for bounds on network flows in a generalization of the boolean lattice

Career

Mathematics Tutor at Tutor Me LA

June 2016 - September 2019

Private tutoring for undergraduate UCLA students as part of the UCLA Guardian Scholars scholarship.

Computer Science Instructor at PlanetBravo

June - August 2018

Teaching introductory and intermediate computer science courses for young children.

Optimizing B'nai Mitzvah Scheduling

2018,2019 - recurring

Automated scheduling of B'nai Mitzvot of ~130 students of Sinai Temple via mixed-integer linear programming.

Founder at GroupThere

May 2017 - present

Launched a carpool optimization tool at grouptherenow.com. Minimizes drive-time across groups of 2-100. Configured for activist organizations. "Bee Swarm for Cars".

Developer at FactoryOfEverything

August 2016 - March 2017

Developed a model for purchasing, production, shipping, and holding over a factory-warehouse-retail system. Forecasting using classical signal processing, regression, and machine learning. Implemented MVP in MATLAB. Planned use-case: optimizing a SoCal cosmetics factory group.

Tutor for Incarcerated Youth at M&I Education Consulting

March 2015 - October 2017

Math and CS tutoring for incarcerated and foster youth through M & I Education Consulting in Long Beach, CA.

Honors

Outstanding Presentation Award

2014

Joint Mathematics Meeting, Baltimore, MD

Awarded to 15% of undergraduate research groups presenting work at JMM (the most-attended national Mathematics conference) for summer 2013 research.

Llewellyn Bixby Mathematics Prize

2012

Department of Mathematics, Pomona College

Awarded annually to the student with highest achievement within the Department.

Skills

Code: Python, Node, Java, C++
Frontend: JS, Angular, HTML
Backend: Flask, Django, ExpressJS

Container: Docker, Kubernetes, Helm
Cloud: GCP, AWS, Heroku
Database: SQL, PSQL, SQLAlchemy, Spark

Optimization: Pyomo, COIN-OR, GUROBI
Computation: R, MATLAB, Mathematica
Presentation: LaTeX, Markdown, Jupyter