



# Zach Siegel

## Math, Code, Education

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### Me

I am passionate about optimization. I like to bring together recent and proven technologies to create solutions that help people. I also strive for freedom and dignity for all people, and actively contribute to several volunteer organizing projects in LA.

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### Education

Pomona College  
*BA in Mathematics, 2014. Computer Science minor. GPA 3.63.*  
Indian Institute of Technology, Kanpur  
*Mathematics Department, Spring 2013.*

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### Career

Computer Science Instructor at PlanetBravo *June 2018 - present*  
Teaching introductory and intermediate computer science courses for children. Led projects using Flask, Dialogflow, and Firebase.

STEM Tutor at Tutor Me LA *June 2016 - present*  
Private tutoring of UCLA students as part of the UCLA Guardian Scholars scholarship.

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. Webapp and Facebook chatbot interfaces. "Bee Swarm for Cars".

Tutor for Incarcerated Youth at M&I Education Consulting *March 2015 - October 2017*  
Math and CS tutoring for incarcerated youth and foster youth through M & I Education Consulting in Long Beach, CA.

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.

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### Research

Optimizing B'nai Mitzvah Scheduling *2018*  
*Sinai Temple, Los Angeles*  
Automated and optimized yearly scheduling for B'nai Mitzvot of 130 students of Sinai Temple.

Predictive Policing in Los Angeles	2017
<i>Stop LAPD Spying Coalition</i>	
Implemented LAPD's "hotspot"-generation algorithm. Compared hotspots to historical arrest, citation, and crime report data from the City of Los Angeles. Community-generated report is entitled "Predictive Policing in Los Angeles".	
Generative Models And Sparse Coding	2014
<i>Department of Mathematics, Pomona College</i>	
Formalized connections between the "Boltzmann Machine Distribution" and state-of-the-art unsupervised learning techniques.	
Anomaly Detection Using Dictionary Learning	2013
<i>University of Minnesota, Minneapolis</i>	
Achieved state-of-the-art unsupervised detection of anomalous image and video data using dictionary learning and sparse coding. Part of an NSF-funded REU.	
Aquatic Insect Populations' Response To Time-Varying Reproductive Rates	2012
<i>Oregon State University</i>	
Modeled insect populations in MATLAB using partial differential equations. Developed field data collection methodology to study model accuracy. Part of an NSF-funded REU.	
Zero-Sum Flows of the Linear Lattice	2012
<i>Department of Mathematics, Pomona College</i>	
Proved conditions for bounds on network flows in a generalization of the boolean lattice	

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## Honors

Outstanding Presentation Award	2014
<i>Joint Mathematics Meeting, Baltimore, MD</i>	
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
<i>Department of Mathematics, Pomona College</i>	
Awarded annually to the student with highest achievement within the Department.	

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## Skills

Python	AWS, Heroku	Firestore, DialogFlow
Java	HTML, CSS	SQL, ORM
C, C++	JS, Angular (JS & 2+)	COIN-OR, GUROBI
R, MATLAB	Flask, Django, Express	LaTeX