

# MATTHEW SOTOUDEH

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## EDUCATION

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### University of California, Davis

*BS Computer Science, BS Mathematics; Regents Scholar; GPA: 4.0*

Davis, CA

Grad: Jun 2021

### Lynbrook High School

*GPA: 3.9*

San Jose, CA

Grad: Jun 2017

## EXPERIENCE

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### Davis Automated Reasoning Group

*Student Researcher*

Davis, CA

December 2018 — Present

- Working on a variety of research topics related to automated reasoning, verification, and artificial intelligence under Professor Aditya Thakur with the Davis Automated Reasoning Group (DARG).
- “Computing Linear Restrictions of Neural Networks” (<https://arxiv.org/abs/1908.06214>) accepted at the Conference on Neural Information Processing Systems (NeurIPS) 2019.
- “A Symbolic Neural Network Representation and its Application to Understanding, Verifying, and Patching Networks” (<https://arxiv.org/abs/1908.06223>) currently undergoing peer review.

### Intel AIPG, Office of the CTO

*Research Intern*

San Diego, CA

Jun 2018 — Sep 2018

- Developed a novel, fully-automated compiler system for heterogeneous, parallel systems.
- Fully automatic lowering of arbitrary linear algebra computations onto fixed-function accelerator instruction sets using a novel two-operand version of TVM IR, efficient sub-graph isomorphism solver, and feedback-driven transformation-space search.
- Unified interface to compiler heuristics enables rapid, reproducible testing of new heuristics (including ML-driven models).
- Tests on an upcoming deep learning architecture can achieve up to 3-5X faster execution times than hand-optimized kernel libraries.
- Work has already influenced other compiler and software teams across the company.
- “ISA Mapper: A Compute and Hardware Agnostic Deep Learning Compiler” (<https://doi.org/10.1145/3310273.3321559>) presented and published as a full paper at the ACM International Conference on Computing Frontiers, 2019.

### Intel Labs

*Research Intern*

Santa Clara, CA

Jul 2016 — Jan 2018

- Developed state-of-the-art ML parameter compression method. Up to 60% accuracy improvement over existing work after compressing models up to 1000×
- Optimized compressed matrix-multiplication routine achieves 15× faster inference than MKL.
- Wrote a unified library that simplifies implementation of multiple compression methods in TensorFlow by expressing each method as a weight-generating sub-graph.
- “C3-Flow: Compute Compression Co-Design for Deep Neural Networks” (<https://doi.org/10.1145/3316781>) presented and published as a full paper at the Design Automation Conference, 2019.

## Develop Summer Academy

*Co-Founder & Instructor*

San Jose, CA  
Feb 2016 — August 2017

- Taught over 50 local middle school students programming, leadership, and other life skills
- Developed courses, marketed the camp, handled logistics, and taught classes
- Recognized by our school, district, and House Representative Ro Khanna
- Over \$30,000 in revenue over two summers.

## Action

*Co-Founder & Chief Software Engineer*

San Jose, CA  
Nov 2014 — Jan 2016

- Improved the meeting follow-up experience for 1,000s of meetings at Google, Microsoft, UC Berkeley, and others. Featured on Chrome Web Store.

## SKILLS

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Fields:	Machine Learning, Formal Methods, Compilers, Efficient Software
Programming Languages:	C, C++, Python, JavaScript, HTML, CSS
Other:	Education, course development

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## PROJECTS

### **Docs Plus** *JavaScript, jQuery, Chrome and Firefox add-on APIs*

Only add-on library that enables deep integration support with the Google Kix editor

### **SharpSwift** *C#, Swift, Roslyn*

C# - Swift transpiler, one of the first projects to use the Roslyn Compiler and Swift language

More projects can be found at <https://github.com/matthewsot>

## RECOGNITION

### **Rep. Ro Khanna Congressional Award**

Recognized by House Representative Ro Khanna for my role in founding the innovative Develop Summer Academy.

### **1st Place FBLA State & National Competitions**

Jun 2014, Apr 2015

Won first place against hundreds of teams across the country for two e-business websites I built and presented.

### **1st Place Application at CodeDay SV**

Oct 2014

An early version of our meeting efficiency add-on Action beat dozens of other teams at the CodeDay SV hackathon