

## Education

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ETH Zurich	Graduation expected Spring 2018
Master's of Science, Robotics	
University of California, Berkeley	Graduated 2016 with Dean's Honors
Bachelor of Science, Electrical Engineering & Computer Science	<u>GPA</u> : 3.74

## Undergraduate Research Experience

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- International Computer Science Institute** (Jan – Oct 2016)
- ❖ Experimented effectiveness of complex-valued neural networks on fMRI reconstruction and SAR identification
  - ❖ Devised a visual question-answering algorithm for quantifying symmetry in images
- Self-Motivated Research** (Aug 2015 – present)
- ❖ Exploring use of Deep Q-Learning for autonomous vehicle control using visually-rich driving simulation
  - ❖ Authored a paper on the speedup of distributed neural nets via IPC compression
  - ❖ Implemented the Graph Neural Network (Scarselli '09) in Torch for use in traffic prediction
- Berkeley Institute for Data Science** (Jan 2015 – Jan 2016)
- ❖ Performed web scraping, storage, analysis, and learning of textual and image data from specific commodities
- National University of Singapore** (Aug – Dec 2014)
- ❖ Research approximate computing using floating-point precision tuning and its effects on FPGA performance

## Work Experience

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- Google / Nest** – Palo Alto, CA *Software Engineering Intern* (May – Aug 2015)
- Created backend for an internal tool for automating mobile app UI alteration and exploration
  - Helped develop a page-object framework for self-navigating Android, iOS, and web applications
- NVIDIA** – Santa Clara, CA *Software Engineering Intern* (May – Aug 2014)
- Worked on Android Platform Team to customize, debug, and add features to AOSP framework for Nvidia devices
  - Implemented dynamic region-based package management and customized filesystem for external storage
  - Assembled a custom Android file manager, generalized for future personalization
- Intertrust Technologies** – Sunnyvale, CA *Software Engineering Intern* (Jun – Aug 2013)
- Developed an NFC security library and application on Android platform for internal company projects
  - Implemented front-end procedure for cloud storage data transfer used by the Kabuto collaboration platform

## Skills & Knowledge

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- *Languages*: C, Python, Java, C++, CUDA, OpenCL, Ruby, Scala, JavaScript, R, SQL
- *Frameworks*: Caffe, Torch, H2O, Scikit, SciPy, Spark, Hadoop, OpenMP, Node
- *Software*: MATLAB, Git, SVN, Autodesk Inventor, Multisim, LaTeX
- *Mathematics*: Multivariable Calculus, Linear Algebra, Differential Equations, Discrete Math, Combinatorics
- *Electrical Engineering*: Microelectronic Circuits, Signals & Systems, Convex Optimization
- *Physics*: Astrophysics, Quantum Mechanics, Relativity, Kinematics, E&M, Optics
- *Other*: Fluent in Farsi with basic knowledge of French; BSA Eagle Scout 2011

## Courses and Projects

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### *Computer Vision (2016)*

- Performed 3D rotation, homographies, segmentation, histogram equalization, & Multi-view reconstruction
- Learned about various CNNs, including R-CNN, Recurrent nets, LSTMs, and Siamese Networks
- Devised scheme to morph images based on classification networks as custom project

### *Computer Graphics (2016)*

- Implemented rasterization, texture mapping, Bezier surfaces, meshes, shaders, lenses, and ray-tracing
- Created a General-Relativistic raytracing program as custom project

### *Parallel Computing and Software (2015)*

- Learned parallel design patterns and architectural paradigms for multi-core, GPU, and distributed computing
- Initiated a custom project to speed up large-scale distributed neural-nets via IPC reduction (and succeeded)

### *Image Manipulation and Computational Photography (2015)*

- Assembled a pipeline for processing and identifying new supernovae using the KAIT telescope (Custom project)
- Wrote programs that automatically align, contrast, hybridize, blend, resize, carve, morph, and stitch images

### *Machine Learning (2015)*

- Implemented Linear/Logistic Regression, kernel methods, PCA, Neural Nets, unsupervised and scalable learning

### *Artificial Intelligence (2015)*

- Implemented CSPs, MDPs, RL, Bayes Nets, GMM, HMMs, Decision Trees, and SVMs in projects

### *Computer Security (2015)*

- Learned cryptography, block ciphers, RSA, DoS, TLS, TCP-IP, UDP, hashing theory, and Bitcoin blockchain
- Performed buffer-overflow, DNS spoofing, SQL Injections, and XSS Injections on mock targets

### *Efficient Algorithms and Intractable Problems (2014)*

- Learned optimization, FFT, recurrence relations, graph theory, greedy algorithms, DP, complexity theory

### *Operating Systems and Systems Programming (2014)*

- Implemented multiprogramming in an OS via threads, schedulers, shared file system, and VM mapping
- Created both a local and network-distributed key-value store system with atomicity and concurrency

### *Database Systems (2014)*

- Learned and implemented DBMS, entity-relationship models, and relational databases
- Engineered a database server with web-client interface and backend, from scratch, for an event-booking system

### *Computer Architecture (2013)*

- Implemented keyword-proximity search to run remotely on Amazon EC2 servers via Hadoop
- Utilized OpenMP, SSE SIMD, and various optimizations to speed up image convolution by a thousand times
- Constructed a functioning, pipelined MIPS CPU using Logisim
- Built a MIPS assembly instruction simulator in C

### *Data Structures and Algorithms (2013)*

- Created a graph-based computer board game and AI player that plays based via self-pruning Minimax
- Learned streams, disjoint-sets, splay trees, 2-4 trees, heaps, amortized analysis, and run-length encoding

### *Structure and Interpretation of Programs (2012)*

- Made an interpreter for Scheme Lisp
- Wrote a program to parse, search, and geographically map scraped Twitter data

### *iD Introduction to C++ [Stanford University] (2011)*

- Designed and created five games from scratch as personal projects