Albert Gural

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Education

Stanford University — **Stanford, CA**
Ph.D. Electrical Engineering — *Sept. 2016 - present*

California Institute of Technology — **Pasadena, CA**
B.S. Electrical Engineering with a minor in Computer Science, GPA: 4.0 — *June 2016*

- **Selected Coursework:** Senior Thesis (MICS Lab), Machine Learning and Data Mining, Embedded Systems (FPGA Oscilloscope), Advanced Digital Systems (AVR Processor in VHDL), Mixed-mode Integrated Circuits, Feedback and Control Circuits, Signal-Processing Systems, Combinatorial Analysis, Stochastic Processes, Discrete Differential Geometry, Quantum Computation
- **Activities/Awards:** ACM-ICPC (international collegiate programming contest - **Honorable Mention** at internationals, *2016, Thailand*; **1st place team** at regionals, *2015*; 4th place team, *2014*), The Kiyo and Eiko Tomiyasu SURF Scholar award (Caltech, *2015*), member of Tau Beta Pi honor society

Thomas Jefferson High School for Science and Technology — **Alexandria, VA**
Senior Research in Computer Science, GPA: 4.45 — *Sept. 2008 - June 2012*

Work and Experience

Caltech (Azita Emami MICS Lab), *Named Summer Undergraduate Research Fellow* — *Summer 2015*
- Designed and simulated a novel PLL-based potentiostat for measuring dopamine concentrations *in vivo*.
- Used Cadence Virtuoso with 45nm CMOS predictive models.

Jane Street Capital, *Software Developer Intern* — *Summer 2014*
- Completed two projects - (1) fault-tolerant distributed lock server to replace NFS locks; (2) plugin support for the internal trader tool as well as a plugin ecosystem for trader developers with version control.
- Used OCaml (including the Async monad, RPCs, DynLoader).

Google (Research Division), *Software Engineering Intern* — *Summer 2013*
- Developed image processing techniques to clean a sequence of object photos to QA specifications, allowing for a much larger class of object image sequences to be processed; currently for Google Shopping.
- Used C++, OpenCV, and the Ceres non-linear solver library.

Naval Research Laboratory, *Intern, High Performance Computing* — *Summer 2011, 2012*
- *Summer 2012:* Built a molecular dynamics simulation in C; compared different integration step algorithms including brute force, linked cell, and monotonic Lagrangian grid.
- *Summer 2011:* Created an MPI (Message Passing Interface) library for parallel operations on a grid in C++, tested on a wave propagation simulation, then analyzed its efficiency.

California Institute of Technology, *Teaching Assistant* — *2014, 2015*
- *Algorithms:* Lectured and created course materials for topics including graph algorithms, greedy algorithms, dynamic programming, flow networks, and linear programming.
- *Electronics Laboratory:* Conducted homework and laboratory sessions in topics including discrete analog components, op-amp circuits, and differential amplifier circuits.

Projects

Schematic and layout for implantable Potentiostat, fabricated in TSMC 65nm — *Spring 2016*
Design and construction of reflow oven utilizing a fully-analog PI-controller — *Spring 2016*
Potentiostat utilizing an all-digital phase-locked loop in 45nm CMOS technology — *Summer 2015*
Design and construction of 1kW Solid-state Tesla coil — *Summer 2015*
6-8 GHz all-digital delay-locked loop in 45nm CMOS technology, *group project* — *Spring 2015*
8-bit AVR-compatible processor in VHDL for a Xilinx FPGA, *group project* — *Winter 2015*
5MHz bandwidth FPGA-based oscilloscope, designed and built from scratch — *Spring 2014*
Robotrike firmware (interrupt-based OS written exclusively in x86 assembly) — *Fall 2013*

Tools and Languages

C/C++, Java, Python, OCaml, Haskell, VHDL/Verilog, x86 Assembly, LaTeX, Mathematica, Git, Bash, OpenCV, MPI (parallelization platform), Altium, Altera and Xilinx toolchains, SPCIE, Cadence Virtuoso