

IAN TOYOTA

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EDUCATION

Harvard University

S.B. Candidate in Electrical Engineering

Cambridge, MA

Expected May 2027

Relevant Coursework: Power & Energy Systems, Modern Power Systems, Circuits and Devices, Signal Processing, Electromagnetism, VLSI Design, Computing Hardware (FPGA + Verilog), Linear Algebra, Differential Equations, Digital Fabrication.

TECHNICAL SKILLS

Power & Energy Systems: MATPOWER, PandaPower, PyPSA, PowerWorld, PSCAD, Simulink

Hardware & Embedded Systems: PCB Design (EasyEDA), Schematic Capture, Soldering, ESP32, FPGA, Oscilloscope, Multimeter, Logic Analyzer, Signal Generator

Programming & Data: Python (optimization, data analysis), C/C++, Verilog, MATLAB

Design & Prototyping: Fusion 360, 3D Printing, Rapid Prototyping, Troubleshooting

Tools: Git, Microsoft Suite, Revit

ENGINEERING EXPERIENCE

Kenya Electricity Transmission Company (KETRACO)

Intern, Design & Construction Division

Nairobi, Kenya

May 2025 – Aug 2025

- Supported commissioning and testing of high-voltage substations through field testing, relay diagnostics, and protection verification (CMC test equipment).
- Analyzed SCADA and protection relay data for fault investigation and performance validation in collaboration with senior engineers.
- Modeled transmission-line behavior and system stability in Simulink to support equipment sizing and design review for a national grid expansion project.

Bonmassar Lab, Martinos Center, Harvard Medical School

Research Assistant

Boston, MA

Feb 2025 – May 2025

- Designed and fabricated MRI-compatible microelectrode assemblies for neural stimulation research, integrating mechanical design with electrical validation.
- Assembled and debugged prototypes using oscilloscopes and signal generators to verify continuity, signal integrity, and noise performance.
- Designed 3D-printed fixtures in Fusion 360 to improve repeatability and reduce fabrication time by 50%.

PROJECTS

Impacts of Renewable Penetration on Grid Costs & Optimal Battery Deployment

- Built an optimization model on the ERCOT 2000-bus synthetic grid (MATPOWER) to study increasing renewable penetration and operational constraints.
- Evaluated battery siting and co-location strategies to mitigate congestion, reduce curtailment, and improve renewable integration.

Bike Lighting and Speed-Sensing System

- Designed an ESP32-based sensing and lighting system in C/C++; built a compact PCB in EasyEDA and a 3D-printed enclosure in Fusion 360.
- Integrated sensors and LEDs; debugged hardware and firmware with multimeter and oscilloscope to improve reliability in outdoor operation.

32-bit MIPS Processor (I- and R-type Instructions)

- Designed a single-cycle MIPS processor in Verilog (ALU, control unit, and memory interface); validated via simulation and FPGA testing.

LEADERSHIP & ACADEMIC MENTORSHIP

Engineers Without Borders (EWB) – Harvard Chapter

Project Lead

Cambridge, MA

Nov 2025 – Present

- Co-lead a multidisciplinary team of 20 students designing a sustainable community water system under real-world constraints.
- Coordinate implementation planning and field execution, aligning technical work with on-site logistics and safety.
- Maintain detailed technical and operational documentation to support long-term project continuity and knowledge transfer.

Harvard SEAS, Academic Resource Center & Harvard APO

Peer Tutor & Peer Concentration Advisor

Cambridge, MA

Jun 2025 – Present

- Support problem-solving in circuit analysis, filters, and measurement techniques. Advise first-year students on academic planning, and research pathways, and opportunities in engineering.