My Engineering Journey

Portfolio & Experience Overview

Jinwei (David) Li

University of Toronto
BASc Candidate, Electrical Engineering

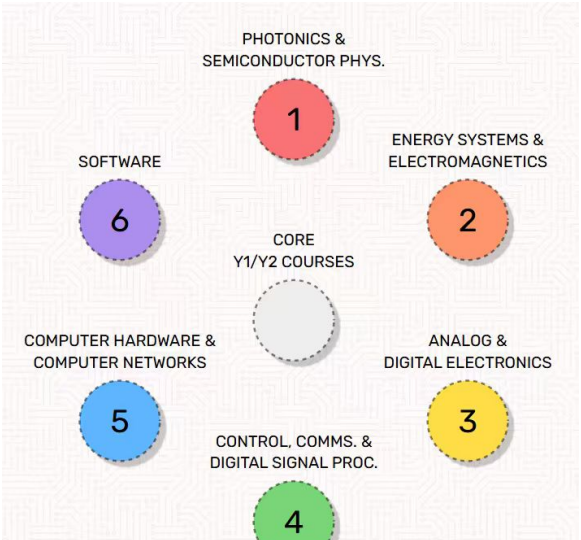
December 25, 2025

Overview

1. Background
2. Personal Undergraduate Curriculum
3. Technical Skills
4. SDR Receiver Project
5. GaN Solar Converter Capstone
6. Device Modeling & Fabrication
7. Leadership & Collaboration

Background

- Jinwei (David) Li, 4th-Year Electrical Engineering undergraduate.
- University of Toronto, BASc candidate (2020–present).
- Deans Honour List twice.
- Emphasis: Digital, Analog, power electronics, micro/nano-fabrication.
- Interested in AI, robotics, and circuit design

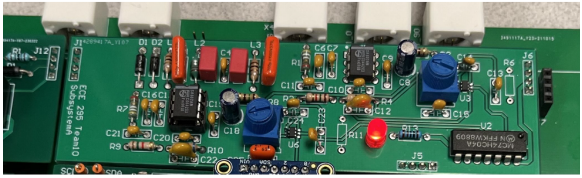


Personal Undergraduate Curriculum

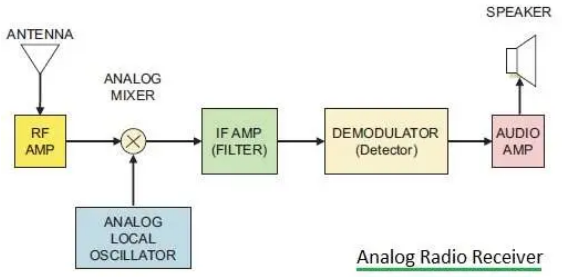
Fundamentals	APS110 Chemistry and Materials Science	APS111 Engineering Strategies	CIV100 Mechanics	MAT186 Calculus I	MAT188 Linear Algebra
	APS105 Computer Fundamental	APS112 Engineering Strategies II	MIE100 Dynamics	MAT187 Calculus II	MAT290 Advanced Engineering Mathematics
	ECE244 Programming Fundamental	ECE243 Computer Organization	ECE302 Probability and Applications	MAT291 Calculus III	ECE221 Electric and Magnetic Fields
Control, Signal Processing	ECE311 Introduction to Control Systems	ECE216 Signals and Systems	ECE241 Digital Systems	BME331 Physiological Control Systems	ECE316 Communication Systems (extra course)
Electronics	ECE110 Electrical Fundamental	ECE212 Circuit Analysis	ECE231 Introductory Electronics	ECE295 Hardware Design & Communication	ECE331 Analog Electronics
	ECE334 Digital Electronics	ECE430 Analog Integrated Circuits	ECE412 Analog Signal Processing Circuits	ECE314 Electrical Energy Systems	ECE313 Energy Sys. & Distributed Generation
Nanofabrication, Semiconductor Physics	ECE330 Quantum and Semiconductor Physics	ECE335 Electronic Devices	ECE318 Fundamentals of Optics	ECE437 VLSI Technology	ECE442 Micro & Nano Fabrication Technologies

Technical Skills

- Python, MATLAB/Simulink, basic C/C++.
- Multisim, LTspice, Sentaurus TCAD simulations.
- Altium Designer PCB design and layout.
- Cadence Virtuoso schematic and layout workflows.
- Skilled with oscilloscope and spectrum analyzer.
- Confident in soldering, rework, and prototyping.



SDR Receiver Project

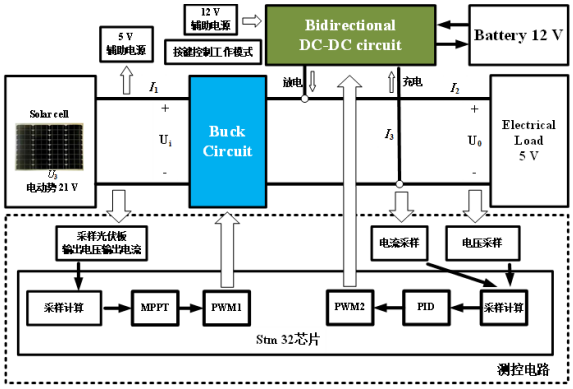


Analog Radio Receiver

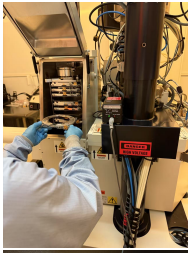
- Designed SDR receiver chain subsystems.
- Built filters, limiter, mixer, amplifier stages.
- Validated design through calculations and simulations.
- Created PCB and documentation using Altium.
- Developed Python tests for bench measurements.
- Achieved better performance than the reference solution.

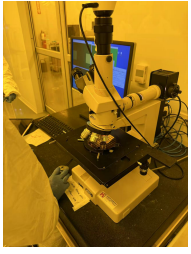
GaN Solar Converter Capstone

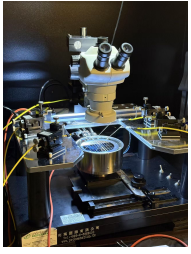
- Designed GaN DC-DC converter for solar charging.
- Added MPPT for changing solar conditions.
- Improved efficiency using high-speed GaN switches.
- Built system architecture and test plan.
- Prepared final report, demo, and presentation.
- Targeted stable output and miniaturized converter size.



Device Modeling & Fabrication







- Simulated devices using Sentaurus TCAD tools.
- Studied semiconductor physics and device behavior.
- Learned micro/nano-fabrication: lithography and etching.
- Understood SEM and TEM characterization principles.
- Built IC blocks and layouts in Cadence.
- Connected device results to circuit performance predictions.

Leadership & Collaboration

- Served as ECE Ambassador at outreach events.
- Peer mentor and tutor for engineering courses.
- Led engineering teams and tracked milestones.
- Coordinated tasks, reviews, and technical progress.
- Presented clearly in meetings and deliverables.
- Strengthened team motivation and accountability.