

Kunal Chandan

University of Waterloo

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B.A.Sc Honours Electrical & Computer Engineering
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Software

- KiCAD
- LTSpice/PySpice
- Cadence
- LayoutEditor
- Quartus Prime
- Linux

Languages

- Python
 - Numpy
 - Pandas
 - Scipy
 - Sympy
 - TensorFlow
 - Pytorch
- C++
- SQL
- Rust
 - nalgebra
 - Rayon
- MATLAB
- Go
- Verilog
- RISC-V
- Shell
- LaTeX

Lab Skills

- PCB Design
- Oscilloscope
- Network Analyzer
- Probe Station
- Wirebonder
- Diebonder
- Plasma Cleaner & Asher
- Dicing saw
- HMDS Oven
- Spincoater
- SEM
- X-Ray Spectroscopy

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Summary of Qualifications

- Multidisciplinary generalist electrical engineering skills specialist in software development at scale in data engineering with **Python** and performance critical development in **C++**
- Experienced electrical engineering skills with clean-room and hands-on electrical lab-work
- Strong electrical engineering foundation through coursework in semiconductor device physics, RF devices, computer architecture, control systems, and IC design

Experience

RESEARCH ELECTRICAL ENGINEER | University of Waterloo 

Sept 2022 - Apr 2023 | Waterloo, ON

- Developed research plan for packaging of μ LEDs onto TFT packplanes using indium electroplating
- Characterized results using **SEM** and **X-Ray Spectroscopy**,
- Simulation

Projects

BEAMFORMING HEARING AID PCB 

- Designed 4 channel microphone array PCB in **KiCAD**, PCB does active analog bandpass filtering, differential amplification, and multichannel **ADC** over **SPI** to Raspberry Pi
- R-Pi does compression and sends audio over **Flask** server for further digital filtering and beamforming
- **Pytorch** to create quantized voice isolation model and minimize latency and maintain performance
- Used **multiprocessing**, **asyncio**, and **websockets** to maximize throughput and performance

PIPELINED RISC-V CORE

- Designed 5-stage pipelined **RISC-V** 32-bit core in **Verilog** using only synthesizable constructs
- Core synthesized on FPGA and successfully ran programs. Testbenches used to ensure cycle accuracy

RAY TRACING ENGINE 

- Implemented 3D recursive path-tracing for arbitrary materials on basic geometric shapes
- Used **nalgebra** for arbitrary rotations & positions of camera & objects
- Parallel processing of ray-tracing using **rayon** yielding **~10X** performance speed-up

Education

UNIVERSITY OF WATERLOO

B.A.SC ELECTRICAL & COMPUTER ENGINEERING 23'

- Electronic devices, Semiconductor physics, Analog/Digital integrated circuits
- Analog/Digital/Multivariable control systems
- Radio frequency and microwave circuits

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