Kunal Chandan

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LANGUAGES

- C++
- Rust
  - Piston
  - nalgebra
  - rayon
- Python
  - Pandas
  - Numpy
  - Scipy
  - TensorFlow
  - OpenCV
  - Selenium
- Shell
- MATLAB
- SQL
- Verilog
- RISC-V
- LaTeX & XeLaTeX

SKILLS

- Linux
- Git
- ADS
- Altium
- Proteus
- LTSpice
- Quartus Prime

EDUCATION

UNIVERSITY OF WATERLOO
4A - B.ASc Electrical Engineering Candidate
Class of 2023

INTERESTS

- Cycling
- Biology
- Juggling

CLUBS

EngPlay Actor
Eng. Ambassador
Eng. Society Rep.
Eng. Orientation Leader

SUMMARY OF QUALIFICATIONS

- Strong data engineering experience from leading projects at Robarts, MappedIn, & OICR
- Excellent data pipeline experience in **Python**, **SQL**, & **Shell** at Robarts, MappedIn, & OICR
- Understanding of **Verilog** & **RISC-V** from coursework involving computer architecture & hardware design

EXPERIENCE

SOFTWARE DEVELOPER | Groq Inc.

Jan 2022 - April 2022 | Mountain View, CA, USA

- Defined resource allocation over memory & processing units of tensors on Groq's TPU
- Developed **Python** & **C++** API to improve streaming of instructions & data
- Used **PyBind11** for interoperability of C++ & Python API for compilation performance
- Used timing analysis to prevent stream conflicts & allowed for interleaving of streams

DIGITAL COMPRESSION RESEARCH ANALYST | Huawei Technologies

May 2020 - Aug 2020 | Waterloo, ON

- Designed collision free non-cryptographic hash function (NCHF) in Galois Field 2
- Analyzed NCHF with SAT solver, self-designed GF(2) matrix solver, & linear algebra to verify target properties
- Benchmarked the optimized SIMD hashing function against existing NCHFs (**Rust**, **C++**)
- Implemented novel border detection algorithm in **Go** using **probabilistic data structures** to maximize performance with go-threads

MACHINE LEARNING DEVELOPER | MappedIn

Sept 2019 - Dec 2019 | Waterloo, ON

- Designed data pipelines for cleaning & analysis; integrated new SQL data warehouse
- Increased prediction accuracy from **40%** to **80%** on existing **LSTM** models with feature engineering, hyperparameter optimization, & automated data cleaning (Python + **SQL**)
- Created **Embeddings** + **SVM** + **Random Forest** ensemble models to replace existing **LSTM** models, reducing inference costs **2X** while maintaining prediction accuracy

SOFTWARE DEV. - BIOINFORMATICS | Robarts Research Institute

Jan 2021 - April 2021 | London, ON

- Developed software in Python & SQL for existing genetics analysis pipeline
- Resolved bugs in existing lab software (Perl, Python, C#)
- Developed software for migration of genetic analysis database from GRCh37 to GRCh38

PROJECTS

RAY TRACING ENGINE

- Implemented 3D recursive ray tracing engine for arbitrary materials on spheres in **Rust**
- Used traits & modular programming to create extensible scene-object interface
- Used **nalgebra** for arbitrary rotations & positions of camera & objects

PHYSICS ENGINE

- Implemented kinematics & electrodynamics written with **Allegro5** & **C++**
- Implemented quadtrees for increased performance from reduced collision checks & fewer negligible force calculations by **pruning tree**

RELEVANT COURSES

- Computer Architecture, Electronic Devices, Semiconductor Physics, Analog Control Systems, Radio Frequency & Microwave Circuits