Kunal Chandan

kchandan@uwaterloo.ca | linkedin.com/in/kunal-chandan | github.com/kunalchandan

LANGUAGES

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

SKILLS

- Linux
- Git
- Altium
- Quartus Prime

CLUBS

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

EDUCATION

UNIVERSITY OF WATERLOO
B.ASc Electrical Engineering Candidate

INTERESTS

- Cycling
- Biology
- Working-out
- Juggling

SUMMARY OF QUALIFICATIONS

- Strong data engineering experience from **leading** projects at MappedIn and OICR
- Excellent data pipeline experience in **Python**, **SQL**, **Shell** at MappedIn & OICR
- Memory constrained and parallel algorithm experience from ray tracer
- Understanding of **Verilog** and **RISC-V** from coursework involving computer architecture and hardware design

EXPERIENCE

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, and linear algebra
- Benchmarked optimized SIMD hashing function against existing NCHFs (**Rust**, **C++**)
- Implemented novel border detection algorithm in **Go** using **probabilistic datastructures**

MACHINE LEARNING DEVELOPER | MappedIn

Sept 2019 - Dec 2019 | Waterloo, ON

- Designed data pipelines for cleaning and analysis; integrated new SQL data warehouse
- Increased prediction accuracy from **40%** to **80%** on existing **LSTM** models with feature engineering, hyperparameter optimization, and 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 and 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

BIOINFORMATICIAN | Ontario Institute for Cancer Research

Jan 2019 - April 2019 | Toronto, ON

- Project lead of new statistical analysis tool for all future studies at OICR-GSI
- Designed genomics pipelines for visualization, cleaning, and analysis; interfacing with existing **R**, **Perl**, and **Shell** pipelines
- Wrote future-proof and extensible code to process big datasets (**Pandas** + **Shell**)
- Open-sourced project and version controlled with **Git**; created extensive documentation

PROJECTS

RAY TRACING ENGINE

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

PHYSICS ENGINE

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

RELEVANT COURSES

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