Kunal Chandan

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LANGUAGES

- C++
- Rust
  - Piston
  - nalgebra
  - rayon
- Python
  - Pandas
  - Numpy
  - Scipy
  - sklearn
  - TensorFlow
  - OpenCV
  - Selenium
- Go
- Shell
- Java
- MATLAB
- SQL
- 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

- Biology
- Working-out
- Juggling
- Cycling

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
- Understanding of **VHDL** and **RISC-V** from coursework involving state machines, testbenches, 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

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

RESEARCH INTERN | Elder Lab, York University

June 2017 - June 2018 | Toronto, ON

- Analyzed human response to visual stimulus with **MATLAB** & **PsychToolbox** with 2 novel experiments; research conducted under guidance of Post-Doc
- Designed data collection methods using **Amazon M. Turk** guided by PhD candidate
- Conducted data augmentation, visualization, interpretation using **Python**, **OpenCV**, and **MatPlotLib** for experimental data pertaining to object recognition

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**