

# Kunal Chandan

kchandan@uwaterloo.ca | [linkedin.com/in/kunal-chandan](https://www.linkedin.com/in/kunal-chandan) | [github.com/kunalchandan](https://github.com/kunalchandan)

## LANGUAGES

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

## SKILLS

- Data Processing
- Data Pipelining
- Linux
- Git
- Altium

## CLUBS

Eng. Ambassador Dept. Lead  
Engineering Society Rep.  
Former Waterloo Embedded  
Member

## EDUCATION

**UNIVERSITY OF  
WATERLOO**  
B.ASC COMPUTER  
ENGINEERING CANDIDATE

## INTERESTS

- 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
- Good ML architecting experience; reduced inference and training costs at MappedIn
- Memory constrained algorithm experience from ray tracer and fluid dynamics solver
- Understanding of **VHDL** and **RISC-V** from coursework involving state machines, testbenches, entities, and GPIO

## EXPERIENCE

### MACHINE LEARNING DEVELOPER | MAPPEDIN

Sept 2019 - Dec 2019 | Waterloo, ON

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

### BIOINFORMATICIAN | ONTARIO INSTITUTE FOR CANCER RESEARCH

Jan 2019 - April 2019 | Toronto, ON

- Designed genomics pipelines for visualization, cleaning, and analysis; interfacing with existing **R, Perl**, and **Shell** pipelines
- Project lead of new statistical analysis tool for all future studies at OICR
- Wrote future-proof and extensible code to process big datasets (**Pandas + Shell**)
- Project open-sourced 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 and shapes in **Rust**
- Used traits and modular programming to create extensible scene-object interface
- Used **nalgebra** for arbitrary camera and object rotations and positions
- Parallel processing of ray-tracing using **rayon** yielding **2X** performance speed-up

### 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**

### OTHERS

- 2D Lattice-Boltzmann fluid dynamics solver written in **Rust** using **Piston**
- WaterlooWorks and OscarPlus (McMaster) job crawler written with **Selenium**
- Webcrawler for scraping comics from KissComics, circumvented Google Captcha