






Shuhao Liu

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SKILLS

Proficient Languages: Python, C++, SQL, R, Java, Scala, C, JavaScript, Bash

Frameworks: AWS, Spark, MySQL, Redis, Kafka, Google BigQuery, Databricks, Oracle Database, Salesforce

Libraries and Tools: numpy, pandas, PyTorch, TensorFlow, OpenCV, scikit-learn, matplotlib, Tableau, Jupyter, Git

Focus: Machine Learning, Computer Vision, Data Science & Engineering, Database Design, Modelling, Optimization

EDUCATION

University of Waterloo

Sep 2018 - Apr 2023

- Bachelor of **Computational Mathematics** and **Statistics**, Minor in **Computer Science**, **Co-operative Program**
- President's Scholarship of Distinction Recipient

INTERNSHIP EXPERIENCE

Autodesk: Manufacturing Software

Toronto, ON

ML Research Engineer

May 2023 — Present

- Developed a search engine for the fastener library in Fusion 360 with **BM25** (text matching), **BERT** (Word2Vec), and **LambdaMART** (Learn-To-Rank) using **AWS OpenSearch** and **PyTorch**

Lumafield: Industrial CT scanning

San Francisco, CA

Machine Learning Engineer

Sep 2022 — Dec 2022

- Built and implemented primitive extraction feature that automatically identifies and reports primitive shapes in 2D images and 3D volumes with 98% dimensional accuracy using **hough transformation**, **maximum filter** and **KDTree** in **Python**
- Engineered inclusion analysis enabling manufacturers to detect artifacts and to study distribution of high density materials in objects using CT technology with **Otsu thresholding**, **binary labeling**, **morphological opening and closing** using **Dask**
- Researched and developed a machine learning model that reduces noise on CT reconstructions 20% more effectively and 3000% faster than traditional algorithms based on **Noise2Void** scheme with **U-Net** using **TensorFlow**

Software R&D Developer

May 2022 — Aug 2022

- Owned Auto-Scan feature in CT operation that automatically derives quality-optimizing scan settings and moves the objects to the optimal composition with precision surpassing humans, speeding up setup process by 600%
- Architected a **VGG-Net** based machine learning model that identifies objects with precise bounding boxes in radiographs achieving 95% accuracy (IoU) with high data quality and sophisticated data augmentation techniques using **TensorFlow**
- Designed a multi-threaded interactive bounding box labeler application in **Python** to facilitate data gathering process

Flow Asset Management: Quantitative Trading

Beijing, China

Data Scientist

Sep 2021 — Dec 2021

- Developed a versatile ETL pipeline on Linux file system processing millions of quantitative trading records daily using **Python**
- Validated millions of trading records using **edit distance** algorithm with extreme optimization reducing run time by 800%
- Implemented a command-line interface to retrieve large-scale sequential time series data in milliseconds using **C++**

Tongtech: Enterprise Software

Beijing, China

Java Developer

Jan 2021 — Apr 2021

- Integrated **Oracle DB**, **Redis**, **Kafka**, **MongoDB**, and **Elastic Search** to Tongtech's Enterprise ETL software using **Java**

Manulife: Insurance and Financial Service

Waterloo, ON

Software Developer

Sep 2019 — Aug 2020

- Drove development of a site reliability software including a trigger system that monitors and displays real-time statistics of 10000s of daily API callouts with **Salesforce** Big Objects and Lightning Web Components using **Java**, **JavaScript**, and **HTML**
- Refactored customer service agent desktop improving efficiency by 50% and increasing code coverage by 80% using **Apex**

PROJECTS

2022 SOA Case Comp: Assembled a competitive national soccer team while optimizing economic growth using **KNN** in **R**

Manulife Tech Challenge: Won 1st place with an HRMS speeding up hiring process by 50% using **Python** and **React**

Rubik's Cube Simulator: Built an interactive self-solving Rubik's cube simulator with 3D graphics using **Java**