Gurnoor Bal

Software Engineer (Backend / Data / Platform)
APIs • Data Pipelines • Cloud Infrastructure • Platform Systems
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PROFESSIONAL EXPERIENCE

Korotu Technology Inc. Toronto, ON
Full Stack Software Engineer (Co-op) May 2023 – Apr 2024

- **Developed and deployed** a **cloud-hosted data analytics platform** using Python and Django to process multi-satellite datasets (Sentinel-1/2, GEDI, ICESat), enabling faster environmental analytics for internal users.
- **Built and optimized data ingestion and preprocessing pipelines** in Python, reducing end-to-end processing time by **35%** and improving data consistency across satellite sources.
- **Implemented and integrated** an **ML-based modelling pipeline** (Random Forest, scikit-learn) to generate canopy height and carbon-mass estimates from satellite features, supporting downstream analytics and reporting.
- **Owned cloud infrastructure** on **Azure-based Linux servers**, configuring NGINX, SSL certificates, resource scaling, and monitoring to maintain stable production uptime.
- **Designed and built REST APIs** to serve cleaned and aggregated datasets, enabling downstream analytics and automated reporting workflows.
- **Improved system reliability** by **implementing logging, debugging, and error-handling workflows**, reducing recurring failures and stabilizing scheduled processing jobs.
- **Introduced structured Git branching and code review workflows**, reducing merge conflicts by **30%** and improving the reliability of regular releases.

PROJECTS

ChestScan AI—Medical Imaging Analysis Platform (Python, PyTorch, Data Pipelines, Flask API, Web Interface)

- **Designed and implemented** a **medical imaging analysis pipeline** using PyTorch to process large-scale chest X-ray datasets (CheXpert, MIMIC), supporting multi-class image classification.
- **Integrated a CNN-based inference component** into the pipeline and **exposed predictions via a Flask-based API**, enabling real-time image analysis and structured output for downstream consumption.
- **Developed a web-based interface** to visualize model outputs and **support interpretability** through heatmap-style explanations, improving usability for non-technical users.
- **Coordinated development across a four-person team** using structured sprints and documentation, ensuring timely delivery of a user-facing technical product.

TripTogether - Carpooling App (Dart, Firebase, Google Maps API)

- **Built a mobile application** supporting real-time trip creation and rider matching using Firebase authentication and live data updates.
- **Integrated Google Maps APIs** for routing, geolocation, and dynamic map rendering, enabling interactive trip visualization.
- **Designed user onboarding and fare calculation logic**, improving usability and supporting dynamic rider changes.

Self-Driving Highway Simulation (Python, Algorithms, Traffic Optimization)

- **Developed a traffic simulation** modelling multi-lane autonomous vehicle behaviour, including acceleration, braking, and lane-change logic.
- **Implemented traffic optimization algorithms** that improved overall flow efficiency by **26% and** documented system assumptions and results in a formal engineering report.

TECHNICAL SKILLS

Languages: Python, SQL, JavaScript, Bash, C++
Backend & APIs: Django, Flask, REST APIs
Frontend: React, HTML, CSS
Cloud & Infrastructure: Microsoft Azure, Linux, Docker, NGINX
Data & Pipelines: Pandas, Data Pipelines, scikit-learn
Tools & Practices: Git/GitHub, CI/CD, Debugging, Agile/Scrum

EDUCATION

McMaster University Hamilton, ON
Bachelor of Engineering **(B.Eng.)**, Software Engineering April 2025

- **Summa Cum Laude** | Dean's List | Golden Key International Honour Society
- **Relevant Coursework**: Data Structures & Algorithms, Operating Systems, Databases, Web Programming.