

Mankaran Rooprai

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Education

McMaster University

B.ENG IN SOFTWARE ENGINEERING

Expected Graduation: Apr. 2026

GPA: 3.87

- **Relevant Coursework:** Operating Systems, Computer Architecture, Data Structures & Algorithms, Concurrency
- **Leadership & Activities:** GDSC Backend Team Lead, Captain of Basketball Intramural Team, EcoCar Team Member

Skills

Programming Languages: Python, C++, Java, JavaScript, C#, C, SQL, HTML, CSS

Tools: OpenCV, PyTorch, pandas, scikit-learn, LangChain, React.js, Node.js, PostgreSQL, Flask, Docker, Kubernetes, AWS

Certifications: AWS Certified Cloud Practitioner, Coursera Deeplearning.ai

Experience

IBM Consulting

Toronto, ON

MACHINE LEARNING ENGINEERING INTERN

Sep. 2024 - Dec. 2024

- Shipped a generative AI application, delivering **\$250K** in value and aiding **100+ developers** in gathering business summaries from **12MM+ lines** of legacy COBOL code, using **Python, LangChain, Streamlit, and WatsonX**.
- Reduced summary generation time by **75%** and boosted accuracy through optimized tree traversal, while resolving Mixtral LLM token limit issue with **retrieval-augmented generation (RAG)** using a **FAISS vector database**.
- Developed a PDF table extraction pipeline with **92% accuracy** for bordered tables using LLM validation and **human-in-the-loop** techniques, and **95% accuracy** for borderless columns using **DocumentAI**.
- **Liaised with teams of developers and consultants** to refine technical specifications for a **PostgreSQL full-text search**, improving accuracy for users navigating summaries and ultimately meeting client expectations.

Questrade

Toronto, ON

DEVOPS ENGINEERING INTERN

May 2024 - Aug. 2024

- Launched a Slack bot using **Python Flask**, to automate critical team processes including Artifactory package deletions directly from Slack, significantly streamlining workflows and reducing manual intervention by **40%**.
- Implemented role-based authentication and logging to prevent unauthorized package deletions, integrating **GitLab API** for user management and **Google Sheets API** for maintaining an auditable record of **500+ activities**.
- **Delivered weekly tech talks** to promote learning and knowledge sharing, contributing to **5-star ratings** from my manager and recognition as a top-performing intern.

Telus

Toronto, ON

SOFTWARE ENGINEERING INTERN

Jan. 2024 - Apr. 2024

- Developed a **Python** application to monitor 5G node alarm changes, sending email notifications to teams when alarms changed, eliminating manual checks and human error, and improving efficiency by **96% (20min to 5s)**.
- **Led the migration** of Key Performance Indicator (KPI) dashboards from on-prem Splunk to **GCP Looker**, using Pulumi and BigQuery for data storage and creation, and Looker Modelling Language for dashboard development.
- **Presented** the first proof-of-concept Looker dashboards to directors, effectively showcasing Looker's advanced capabilities and **securing team licenses** to kickstart the official transition from Splunk to Looker.

McMaster University

Hamilton, ON

MACHINE LEARNING RESEARCH ASSISTANT - DEPARTMENT OF COMPUTING AND SOFTWARE

Sep. 2023 - Apr. 2024

- Published a review article in SPIE on **Python-based blockchain solutions for IoT**, conducting extensive research on real-time sensor data storage and proposing advancements in secure data management.
- Simulated IoT node behavior in a blockchain network by building a **Python** application, visualizing metrics like CPU, RAM, and power usage with Matplotlib, and applied **scikit-learn** to detect and address anomalies in 40% of the dataset.

RBC Capital Markets

Montreal, QC

SOFTWARE ENGINEERING INTERN

May 2023 - Aug. 2023

- Transitioned a financial reports generation service **from on-prem to the cloud**, improving scalability and ensuring delivery of daily reports to **100+ RBC traders**, using **Kubernetes, Docker, Helm, and Jenkins**.
- Created a Web API using **C# .NET Framework** to bridge the cloud-based financial reports generation service with on-prem C++ dependencies, ensuring the end-to-end reporting process operates as intended.
- **Presented the cloud migration proof of concept** to a large audience, showcasing the use of cloud technologies to transition on-prem applications to the cloud and manage cloud resources.

Projects

Digit Recognizer KNN 🔄 | C++

- Developed a **K-Nearest Neighbors (KNN) classifier in C++** to classify handwritten digits from the MNIST dataset, achieving **97.05% accuracy** through efficient data loading, model training, and evaluation.

Real-time Hand Gesture Recognition 🔄 | Python, PyTorch, OpenCV

- Developed and trained a **convolutional neural network (CNN) model in PyTorch** to recognize American Sign Language alphabet gestures in real-time, using **OpenCV** for video capture and preprocessing, optimized for GPU performance.

AI-Powered Research Assistant 🔄 | Python, NumPy, FAISS, Hugging Face

- Designed an AI-powered Research Assistant using **RAG, LLMs, and FAISS-based retrieval** to generate research papers from user queries, enhancing document retrieval with **dense embeddings** and a FAISS index for efficient similarity searches.