

# Kumkum Choudhary

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## WORK EXPERIENCE

### Northbridge Financial

AI Integrations Engineer

Toronto, ON

Aug 2025 - Present

- Lead the design and deployment of **applied AI systems** that replace manual reporting workflows with automated, **production-grade** pipelines, improving speed, consistency, and data reliability.
- Architect **AI-driven extraction** and optimization workflows to transform unstructured inputs into structured, machine-readable outputs used across analytics and business processes.
- Design and implement an internal front-end enabling non-technical teams to upload, validate, and modify datasets while enforcing schema and pipeline integrity.
- Build and evaluate **LLM-powered tools** using Snowflake Cortex Agents to support agent-style workflows, retrieval strategies, and enterprise-safe decision support.

### University of Toronto

Student Researcher

Toronto, ON

Jan 2025 - Dec 2025

- Applied **regression modeling** to investigate how emotional norms influence word usage in long-term memory, designing custom scripts to analyze linguistic corpora.
- Developed a regression equation correlating emotional valence with word frequency and positional data, enabling predictive insights into memory-related decision-making.

### Medium AI

Software Developer

Toronto, ON

Jan 2025 - Apr 2025

- Contributed to the development of a medical scribe platform using **React** and **JavaScript**, implementing a real-time notification **microservice** containerized with **Docker** and integrated with **cloud-based infrastructure** to improve reliability and performance, resulting in a 35% increase in user engagement
- Refactored legacy code and designed reusable **UI components** to enhance scalability and maintainability within a **CI/CD pipeline** for continuous deployment to clinical environments.
- Integrated **GraphQL** and the AssemblyAI API to streamline data queries and automate transcription workflows.

### Northbridge Financial

Data Engineer Intern

Toronto, ON

Jun 2024 - Dec 2024

- Developed an AI-powered chatbot using **Retrieval-Augmented Generation** to translate language into **SQL** queries
- Boosted **performance by 40%** via prompt engineering with open source LLMs and Cortex API.
- Automated data injection workflows using **Snowflake** and **Power BI**, delivering business-impactful dashboards.
- Presented the chatbot's technical architecture and business value to the CTO, CFO, and IT leadership at a company-wide town hall, and collaborated with Snowflake's Cortex team to identify usability issues and enhance the functionality of the Cortex API

## PROJECTS

### Concept Learning Model

Cognitive Simulation | Unsupervised Learning | PyClarion

Toronto, ON

Mar 2025 - Apr 2025

- Engineered a simulation using the **Clarion architecture**, integrating modular components for sensory and linguistic data representation.
- Applied principles of unsupervised learning to model abstract reasoning and data clustering behaviors in artificial agents.

### DRM Sleep Simulator

Cognitive Simulation | Python

Toronto, ON

Nov 2024 - Nov 2024

- Built a **LSTM neural network simulation** to model cognitive effects of sleep on memory accuracy using synthetic datasets, successfully replicating empirical study findings. Designed data pipelines for input processing, sequence modeling, and result visualization, ensuring reproducibility and testability.

### Contacts Tracking App

Swift | SwiftUI | App Development

Toronto, ON

Jul 2024 - Aug 2024

- Designed and developed a contact lens tracking app using **SwiftUI**, optimizing UI rendering

### F1 predictive model

Machine learning | Python

Toronto, ON

Jan 2024 - Apr 2024

- Built a Recurrent Neural Network (RNN) model to predict lap times and driver positions with 80% accuracy.
- Tuned deep learning pipelines and **evaluated architectures** to boost prediction accuracy by 55%.

### IRT modification

Machine learning | Python

Toronto, ON

Sep 2023 - Dec 2023

- Enhanced learning assessment algorithms through parameter tuning in an **IRT-based model**, achieving 90% accuracy.

## SKILLS

**Languages & Tools:** Python, Java, SQL, JavaScript, Swift, C++, React, GraphQL, REST APIs, Azure Data Factory (ADF), Power BI, Snowflake

**Frameworks & Libraries:** PyTorch, TensorFlow, Scikit-learn, NumPy, Pandas

**Machine Learning:** LLMs, RAG, RNNs, IRT, NLP, Unsupervised Learning, Model Optimization

## EDUCATION

### University of Toronto

Bachelor of Science; Computer science, Cognitive science and Mathematics

Toronto, ON

Jun 2025