Navdeep Singh

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EDUCATION

University of Alberta   **Edmonton, Alberta**
B.S. in Computer Science and Bioinformatics   *Expected Graduation, Dec 2024*

- **Concentrations:** Artificial Intelligence/Machine Learning, Generative AI, Computer Vision
- **GPA:** 4.0/4.0, *Dean's Honour List, The Canadian Information Processing Society Scholarship, The Microquest Leadership Award in Computing Science, A Louise McKinney Post-Secondary Scholarship, etc.*
- **Related Coursework:** Data Structures & Algorithms, Software Engineering, Machine Learning, Artificial Intelligence, Object-Oriented Programming, Computer Vision, Reinforcement Learning, Game Development, Statistics & Applications

TECHNICAL SKILLS

Programming: Python, Java, JavaScript, HTML/CSS, SQL, C#, C++, C, R
Tools: Android Studio, Jupyter Notebooks, Git, MongoDB, Firebase, Figma, Unix, Unity, Unreal Engine, .NET, REST, API, Documentation, PyTorch, TensorFlow, Hugging Face, JSON, Junit, Augmented Reality, Deep Learning, Jira, CUDA, MS Office

WORK EXPERIENCE

My Viva Inc.   **Edmonton, Alberta**
Software Developer Engineer   *May 2024 – Present*

- Deploying a mobile application using **.NET, REST, Unreal Engine, and C#** that enables users to chat with an **AI** bot for daily wellness advice

Huawei Technologies Canada Co. Ltd   **Edmonton, Alberta**
Artificial Intelligence Engineer   *May 2023 – Dec 2023*

- Optimized Stable Diffusion 1.5 and 2.1 **(Generative AI)** using techniques such as pruning, knowledge distillation, and step-distillation to achieve **89%** latency improvements
- Authored **Python** scripts to prepare fine-tuning datasets with over **13 million** images that results in **FID** and **CLIP scores** of **32** and **30** respectively
- Used **scikit-learn** and **PyTorch** to visualize and inject **attention maps** to build a diffusion-based image-editing model for cellular deployment

University of Alberta – Dr. Guohui's Lab   **Edmonton, Alberta**
Research Assistant   *May 2022 – Aug 2022*

- Developed a Convolutional Neural Network to predict antigenicity based on amino acid sequence of Influenza A virus that is being used to create a system to determine the best vaccine for upcoming flu seasons using **Python**
- Scraped NCBI for **285** sequences and trained model to achieve an Accuracy and F1-score of **94** and **97** respectively
- Prepared analytic data for visualization using **Excel** and **R** to be used in research paper drafts

Rehabilitation Robotics Laboratory   **Edmonton, Alberta**
Augmented Reality Developer   *May 2022 – Aug 2022*

- Developed the application GlenxRose using **Unity, Photon Engine 2**, and **C#** - Improving Patient Adherence to Therapies for Patients with Acquired Brain Injury Using **Augmented Reality**

PROJECT EXPERIENCE

Chemical Text-Mining System   **Edmonton, Alberta**
Team Lead   *Jan 2024 – Present*

- Used **Langchain** and **Chainlit** to develop a **ChatBot** that uses **retrieval-augmented generation** from a **Neo4J database** to answer questions related to chemical or metabolic biomarkers
- Performed fine-tuning atop prompt-engineered **HuggingFace LLM**, Mixtral-8x7B-Instruct, alongside entity-tagging and data-generation **(SQL),** to create an relation extraction **LLM** with F1-score of **87**, surpassing GPT-3.5-Turbo

Overgrown   **Edmonton, Alberta**
Team Lead and Programmer   *Jan 2023 – April 2023*

- Used **Java** and **RPG Game Maker** to create a mystery, thriller game that won Excellence in Audio Design Award
- Designed, prototyped, and implemented mini-games and custom plugins to enhance gameplay

QR-Game   **Edmonton, Alberta**
Team Lead   *Jan 2022 – April 2022*

- Built an **Android Studio** QR code scanning application following **Object-Oriented Programming** alongside **Agile** approach — generating **UML** diagrams, **CRC** cards, prototyping with **Figma**, and developing **7 Junit tests**
- Implemented scanner, user and owner actions, interacting with **Firebase** database, writing scoring and ranking algorithms