IKJYOT SINGH

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EDUCATION

University of Alberta - Bachelor of Science in Computing Science with Specialization - GPA 3.7
August 2022 – April 2026
Relevant Coursework: OOP, Algorithms, Data Structures, Search & Planning in AI, Reinforcement Learning, Computer Vision, Cybersecurity Principles

RELEVANT EXPERIENCE

AI Developer – So Shall We Inc.
December 2024 – Present

- Built a recommendation engine for Providoor, a Shopify-based online retailer, optimizing suggestions for ~250 Shopify products using TF-IDF, cosine similarity, and co-occurrence matrices.
- Deployed a RAG pipeline on AWS with Lambda, DynamoDB, and Shopify API for real-time product suggestions.
- Automated monthly data updates to improve recommendations and support future user-rating integration.

Software Developer – Dr. Dash's Lab, Faculty of Rehabilitation Medicine, University of Alberta
May 2024 – Present

- Assisted in NLP analysis of verbal fluency data from 127 patients, using cosine similarity to measure semantic distance and identify differences in semantic mapping between Alzheimer's patients and healthy controls.
- Developed a Python program to parse 242 .cha files and clean ~8,000 datapoints using Pandas.
- Researching word embedding, semantic granularity, and the extraction of lexicosemantic features from patients' words.

Computer Vision Research Assistant – Dr. Cummine's Lab, Faculty of Rehabilitation Medicine, University of Alberta
May 2024 – December 2024

- Developed a CNN model to classify patients with learning impairments using TensorFlow using Multi-Instance Learning.
- Automated the pre-processing (parsing and cropping) of 8,000+ 3-dimensional MRI images.
- Implemented methods to counteract overfitting including data augmentation, k-fold cross validation, LOO-CV, and L2 regularization. Implemented feature analysis methods such as SHAP, Grad-CAM, Saliency maps, and LIME.

PROJECTS

Marvel Movie Bot: Context-Rich Chatbot Using Retrieval-Augmented Generation
June 2025

- Built a RAG-powered chatbot using a local LLaMA model and Pinecone vector store of 19 Marvel movie scripts.
- Developed a React frontend, fastAPI backend, and exposed endpoints with ngrok; deployed frontend on Vercel.
- Tuned chunking and retrieval to outperform standard LLaMA responses in detail and contextual accuracy.
- Enabled character-based responses by simulating Jarvis, Captain America, Hulk, and Black Panther.

Soccer Analysis System: Tracking Game and Calculating Relevant Statistics
August 2024

- Trained YOLO model with open-source data to track players and ball and various possession statistics in a soccer game.
- Used OpenCV feature analysis to keep track of camera movement.
- Estimated speed and distance statistics incorporating Hash Tables and Linked Lists.
- Created custom bounding boxes and interface outputted as AVI video.

PUBLICATIONS

Pfeiffer, S., **Singh, I.**, Kim, E., & Dash, T. (2025). Semantic mapping in Alzheimer's disease: Measuring semantic distance using Natural Language Processing. *In Review.*

SKILLS

- **Languages:** Python, Java, JavaScript, C, C#, R, SQL, HTML, CSS
- **Tools/Frameworks:** Git, JUnit, Google Cloud Platform (Firestore), React.js, Node.js, TensorFlow, PyTorch, REST APIs, RAG Pipelines, AWS Lambda & DynamoDB
- **Libraries:** Pandas, NumPy, Matplotlib, PyDicom, OpenCV, Ultralytics (YOLO)
- **Soft Skills:** Communication (Lab Work), Collaboration (Projects), Critical Thinking (Lab Work)