Gursimar Singh

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Education

University of Toronto — Toronto, ON
B.Sc. Computer Science with a focus in AI, Minor in Mathematics — *Sept. 2022 – May 2026*

- **Relevant Coursework** - Introduction to Machine Learning, Foundations of Computer Science I & II, Data Structures and Analysis, Multivariable Calculus with Proofs, Probability Statistics and Data Analysis I
- 4.0 cGPA, Dean's List Scholar

Experience

Machine Learning Research Assistant — Sept. 2023 – Present
Cognitive Neuroscience & Sensorimotor Integration Laboratory (CoNSens Lab) — *Toronto, ON*

- Using state-of-the-art **convolutional architectures** to model the ventral and dorsal streams in the human brain for **object classification** and **robotic grasping** tasks using **PyTorch**
- Working on novel, **task-agnostic architectures** and **data visualization and analysis** methods to compare the emergence of separate neural pathways to EEG data from the human brain.

Director of Education — June 2023 – Present
UofT Undergraduate AI Group — *Toronto, ON*

- Leading a team of 7 associates to develop and deliver course content to **over 150 students** on topics like **Neural Networks**, **Computer Vision**, **Natural Language Processing (NLP)** and **Generative AI**.

Machine Learning Engineer — May 2023 – July 2023
PhotograFirst — *Toronto, ON*

- Applied **Vision and Swin Transformers** to **Computer Vision** tasks like duplicate detection, semantic segmentation, and ensembling using **PyTorch, Tensorflow, Scikit-Learn** and **Pandas**

Project Director — Sept. 2022 – May 2023
University of Toronto Machine Intelligence Student Team (UTMIST) × PhotograFirst — *Toronto, ON*

- Led a team of 9 developers to make image culling software with complex **Computer Vision** models like **depth detection**, **semantic segmentation** and **neural style extraction** in **PyTorch**, **Tensorflow** and **OpenCV**.

Projects

Research Paper Implementations | *Python, PyTorch, OpenCV, Hugging Face, NLTK* — GitHub Link

- Implemented **Computer Vision** papers on topics like **Neural Style Transfer**, **Generative Adversarial Networks (GANs)** and **Vision Transformers (ViT)**.
- Implemented **Natural Language Processing (NLP)** papers like **LSTMs**, **GRUs**, **Attention**, **Transformers**, **ELMo**, **GPT**, **BERT**, **Neural Machine Translation** and **Language Modelling**.

Studeasy | *Python, Scikit-Learn, Flask* — GitHub Link

- Built a study tool for students using the OpenAI GPT API with features like study notes generation, **Retrieval Augmented Generation (RAG)** for question answering grounded on textbooks, course syllabus summarization, and automatic question generation and answer grading with feedback.
- Won **Second Place** at **Hack the Mist 2023** amongst **over 30 teams** and **120 participants**.

Virtual Whiteboard | *Python, Scikit-Learn, OpenCV, Keras* — GitHub Link

- Built a tool that uses **pose estimation** to extract hand pose landmarks from a video feed and classifies them using a **deep neural network** in **Keras** to allow users to draw on screen through hand gestures.
- Open sourced at **Hacktoberfest 2021** and gathered **31 stars** on GitHub

Technical Skills

Languages: Python, SQL, C, Java, R, Rust
Libraries: PyTorch, Tensorflow, Keras, Scikit-Learn, Pandas, OpenCV, NLTK, Hugging Face, Matplotlib, Flask
Developer Tools: Git, GitHub, Jira, Docker, Google Colaboratory, VS Code