Yuvraj Singh Sandhu

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Summary

Quick learner known for a logical approach to problem-solving and the ability to break down complex issues into manageable components. Enthusiastic about applying critical thinking and analytical reasoning to tackle real-world challenges.

Education

McMaster University, *BASc in Computer Science* *Sept 2021 – May 2025*

- GPA: 3.66/4.0
- Minor in Mathematics

Experience

Teaching Assistant, *McMaster University – Hamilton, ON* *Jan 2024 – Apr 2025*

- Supported live lab sessions by explaining **Python** concepts and addressing student queries.
- Worked with TAs to assess student comprehension and address learning challenges for **1000+** students.
- Graded assignments and provided detailed feedback to students for improvement.

Projects

AI Powered Chest X-ray diagnostic Tool ↗ *Github*

- Designed and deployed a web-based second-opinion platform that analyzes chest X-rays using deep learning to detect and localize 14 different chest conditions.
- Achieved **92% AUROC** by training a fine-tuned DenseNet201 CNN model on **224,000+** chest X-rays from the Stanford CheXpert dataset; evaluated on 33,000+ test images.
- Implemented real-time inference (<**10s**) with Grad-CAM heatmaps to highlight key regions of interest, along with likelihood-based predictions for each chest condition.

Fire Detection using Machine Learning *Github*

- Developed and compared **CNN**, **SVM**, and **KNN** models to classify fire and non-fire images, demonstrating the potential for real-time fire detection in CCTV footage.
- Achieved **97%** test accuracy with CNN, outperforming SVM (92.06%) and KNN (87.14%) in precision, recall, and F1-score. Preprocessed data with resizing, normalization, and **PCA** for dimensionality reduction; implemented techniques to address overfitting in CNN.
- Tools: PyTorch, scikit-learn, NumPy, Pandas.

Personal portfolio ↗ *Github*

- Designed and developed a visually engaging, fully responsive personal portfolio website to showcase my resume, projects, and contact detail.
- Tools: Astro, JavaScript, HTML, CSS, SVG, GitHub Pages

Technologies

Languages: Python, Java, JavaScript, HTML, CSS, SQL, C, Haskell

Developer Tools: Cursor, GitHub, PyTorch, Pandas, MongoDB, Svelte, Astro, Figma, DBeaver, Vim