

HARMINDER SAINI

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Data science enthusiast with expertise in Python, PyTorch, and financial analysis, looking to apply analytical skills to solve complex financial challenges and deliver actionable insights

EDUCATION

Bachelor of Applied Science: Computer Engineering

Queen's University, Smith Engineering, Kingston, Ontario

Bachelor of Arts and Science: Economics

Queen's University, Kingston, Ontario

SKILLS

Python | C Programming | PyTorch | Neural Networks | Java (Object Oriented) | JavaScript | SQL | Assembly Language (Nios II) | Verilog | Data Structures | SolidWorks | Android Studio | Econometrics | Financial Analysis | Statistical Analysis | Data Analysis | Economic Theory

WORK EXPERIENCE/ PROJECTS

Capstone Project: Machine Learning System for Emotion Recognition and Adaptive Tracking

Kingston, Ontario

Team Member

September 2024 – April 2025

- Developed a real-time detection algorithm using **Python**, **PyTorch**, and **OpenCV**, integrating a **YOLOv11**-based emotion recognition system with adaptive camera tracking.
- Engineered a servo-controlled camera mount with a **1-meter vertical range**, ensuring **precise facial alignment** and improved **detection accuracy**.
- Developed and trained a model** on a diverse **15,000-image dataset** with augmented preprocessing, achieving **over 90% classification accuracy**.
- Achieved sub-1-second response times** for emotion detection and camera adjustments, improving system responsiveness and user experience.
- Developed an adaptive feedback system to improve camera alignment using facial orientation and tracking data.

Financial Analysis of The Coca-Cola Company

Kingston, Ontario

Project

June 2024 – August 2024

- Conducted a **three-year financial analysis** of **Coca-Cola**, examining **profitability**, **liquidity**, and **solvency** using key financial ratios (ROE, ROA, current ratio, debt-to-equity).
- Identified a **12.3% increase** in **net income** and improved **debt-to-equity** from **1.41 to 1.29**, reflecting **stronger capital management**.
- Analyzed **segment performance** across **North America**, recommending **strategic adjustments** to improve **market positioning**.
- Delivered a detailed report summarizing **financial trends** and **strategic insights**, demonstrating **analytical** and **communication skills**.

Machine Learning System for Automated Detection of Surgical Instruments

Kingston, Ontario

Team Leader

September 2024 – December 2024

- Developed an **object detection system** to identify and classify **surgical instruments** in real-time using **Python**, **PyTorch**, and the **YOLO framework**.
- Achieved mean average precision (mAP) scores of **0.991 (validation)** and **0.988 (testing)** by training on a dataset of over **3,000 images**.
- Enhanced the dataset with **data augmentations** to address class imbalance and improve detection in challenging conditions, reducing overfitting.
- Improved detection precision by **2%** and computational efficiency by **15%** through advanced attention and feature extraction modules.
- Optimized detection under **occlusion**, achieving a **94% true positive rate** for distinguishing visually similar tools.

Design and Implementation of a Reduced Instruction Set Computer (RISC)

Kingston, Ontario

Team Leader

January 2024 – April 2024

- Led a team project** focused on **designing**, **simulating**, **implementing**, and verifying a **RISC Computer** (Mini SRC).
- Developed a **32-bit machine** with a **32-bit datapath**, **16 registers**, and dedicated registers for multiplication and division.
- Defined instruction formats and categorized instructions into **load/store**, **arithmetic/logical**, **branch/jump**, and **input/output**.
- Designed and implemented a RISC computer with **95% simulation accuracy** and **100% hardware functionality** on the Cyclone V chip.
- Reduced development time by **20%** through efficient use of Quartus Prime and ModelSim

EXTRA-CURRICULAR EXPERIENCE

Queens's Space Engineering Team

Kingston, Ontario

Onboard Computer Systems Team Member

September 2023 – December 2023

- Implemented **microprocessors**, **memory banks**, and **interfacing chips** to establish connections between components in a mini satellite.
- Coordinated tasks among satellite components, achieving a **95% efficiency in system integration**.

Queens's Robotics Team

Kingston, Ontario

3D Modeling Lead

January 2021 – April 2022

- Designed, modeled, and created a robot for the VEX U Robotics Competition using SolidWorks.
- Built and **programmed a robot** with precise **object manipulation**, **autonomous motion**, human driver support.