Sachin Gill

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Education

University of Waterloo **September 2022– April 2027**

Mechatronics Engineering, with AI Option

Relevant Courses: Data Structures (C++), Real-Time OS (C, STM32), Numerical Methods

Work Experience

Systems Engineer - Computer Vision **May 2025– August 2025**

Toyota Motor Corporation *Cambridge, Ontario*

- Built an image augmentation pipeline using Python's albumentations library that eliminated manual data preparation bottlenecks, reducing CV model deployment time by 40 hours, and enabling system installation in 3 new shops
- Designed an image annotation interface in a .NET application with default dimensions that streamlined image labeling to a single-click operation, reducing annotation time by 40 minutes per batch
- Led YOLO to DETR model migration, achieving 60% reduction in false positives on production sample data
- Maintained OAK-D cameras by configuring and repairing multiple production devices to ensure zero downtime

Undergraduate Research Assistant **January 2025– April 2025**

Social and Intelligent Robotics Research Lab (SIRRL) *Waterloo, Ontario*

- Conducted research on conversational turn-taking algorithms and natural language processing (NLP) for social robots under Dr. Kerstin Dautenhahn, improving naturalness and flow of human-robot interaction in healthcare contexts.
- Integrated TurnGPT and VAP audio models on Furhat robots, reducing conversational interruption rate by 10%

Systems Engineer - Robotics **September 2024– December 2024**

Toyota Motor Corporation *Kitchener, Ontario*

- Redesigned deep learning predictive maintenance algorithm with a LSTM architecture using Python's tensorflow library for production robots, creating a dynamic threshold that cut daily false alerts by 500
- Deployed automated AGV notifications with C++ for unresponsive robots, reducing downtime by 30 minutes per shift
- Built a full-stack .NET + SQLite application to manage 200+ innovation showcase votes

Software/Applications Developer **January 2024– April 2024**

MCAN Financial *Toronto, Ontario*

- Modernized 4 legacy ASP.NET mortgage processing pages to align with 2024 standards, reducing broker application time from 90 to 60 minutes
- Optimized lending location algorithm by including only optimal lending locations, enhancing the efficiency of the business team's application processing time by 1 hour

Robotic Process Automation Analyst **May 2023– September 2023**

Day5 Analytics *Mississauga, Ontario*

- Developed end-to-end energy data analytics solution in a fast-paced startup environment automating consumption analysis and pricing optimization recommendations, delivering average $150 annual savings per client

Projects & Design Team

RL Robot Stand Up Policy | Python, MuJoCo, StableBaseline, CUDA, PyTorch

- Designed and implemented a RL algorithm that trains a 30 DOF humanoid robot for autonomous fall recovery
- Created a robust training environment with a fallen pose generation system with 6 realistic positions (back, front, side, sitting, twisted falls) for diverse training scenarios
- Leveraged CUDA programming and PyTorch GPU acceleration to achieve 10x speedup in neural network training

AI Golf Caddie | Python, Pandas, NumPy, OpenCV, MediaPipe, JavaScript

- Built an end-to-end machine learning golf caddie that recommends optimal clubs based on distance and conditions
- Developed a regression algorithm to predict swing distance based on personal statistics, wind, and ball positioning

Software/Firmware Team Member — University of Waterloo Mars Rover Team | C++, ROS2

- Developed firmware training for new team members, including servo motor control using PWM on STM32
- Optimized competition drivetrain performance through ROS2/C++ prototype testing with CAN and I2C protocols

Skills

Languages: Python, C++, JavaScript, Typescript SQL, C, C#, Bash

AI/ML: OpenCV, Keras, MatPlotLib,Tensorflow, PyTorch, Scikit-Learn, Pandas, NumPy, ONNX, YOLO, DETR

Tools & Systems: Git, Docker, Linux, ROS2, PostgreSQL, MS SQL Server, CUDA, .NET, Angular, Node.js