MANNY MIFSUD CASSAR

Curious learner and determined problem-solver building intriguing AI software and embedded systems

Email | 647-546-4442 | My Website | LinkedIn

TECHNICAL SKILLS

- **Languages:** Python, C/C++, LLM Prompt Engineering, Bash, Makefiles, SQL, LaTeX
- **Software:** Linux, GitHub, Docker, PostgreSQL, Grafana, Azure, Microsoft DevOps, Atlassian Suite, CAD, VPN
- **Packages:** pyTorch/Tensorflow, CUDA, Pandas, Numpy, LangChain/Chainlit, ffmpeg, Scipy, Dash/pyQT5, Azure

PROFESSIONAL EXPERIENCE

Software Engineering Intern, Evertz Microsystems, Burlington, ON **2023 – 2024**

- Integrated SharePoint, Jira, Confluence, and SMB data into a unified Python ingest engine, powering a vector database that enabled seamless retrieval for the company's internal RAG LLM to AI-augment the workforce of 2000.
- Developed a GPU-accelerated DDR controller API that boosted hardware efficiency and cut stream bandwidth requirement by 50%, enabling customers to deliver more complex broadcasts and unlock new revenue opportunities.
- Developed an analytics dashboard in Dash with Postgres, surfacing customer queries for leadership insight.
- Implemented product reference tags, conversational memory and continuity, vastly enhancing retrieval relevance.
- Automated unit testing with Playwright in dev-test-deploy pipeline, validating code and reducing deployment risk.
- Built model evaluation and feedback loop (Chainlit), optimizing retrieval relevance and improving LLM accuracy.
- Delivered inline retrieved document viewer and custom file upload context injection, enhancing user workflow.
- Deployed Grafana to dashboard measure hardware utilization during ingest, optimizing vector DB updates.
- Secured the platform with OAuth2 authentication and Azure VPN, protecting design documents and sensitive data.
- Tuned system prompts to filter disallowed responses, aligning outputs with corporate compliance requirements.
- Conceived and executed a new string conversion library that patched over 200 buffer overflow vulnerabilities.

EDUCATION

Bachelor of Computing Honours, Queen's University, Kingston, ON **2025**

- **Specialization:** Artificial Intelligence
- **Relevant Courses:** Artificial Intelligence, Algorithms, Data Structures, Reinforcement Learning, Neural and Genetic Evolutionary Computing, Software + Computer Architecture, Operating Systems, System Level Programming.
- **GPA:** 3.67/4.0, awarded Dean's Scholar with Distinction (*Summa Cum Laude*) (Top 3% of Faculty)

OSSD Ontario Scholar, De La Salle College "Oaklands", Toronto, ON **2020**

SELECTED PROJECTS

Formula SAE Team: Integrated in a team of engineers developing an electric Formula SAE racecar.

- Architected C++ library to initialize communication of our car's ECU, BMS, inverter, dash, and sensor suite.
- Built a real-time PyQt5 telemetry dashboard to visualize battery cell temperatures, SOC, wheel speeds, and throttle/brake inputs from CAN Bus data, laying the foundation for iteration on the car's settings and design in testing.
- Contributed to the design, fabrication, calibration, and testing of our car's electrical harness to ensure race reliability.

Reinforcement Learning Agent: Coded a Proximal Policy Optimization agent for a competitive tournament.

- Engineered observation/action features with reward shaping, leveraging PyTorch in OpenAI Gym, and GPU acceleration to optimize training and improve agent performance in a dynamic enemy-avoidance competition setting.

My Java Web Server: Created and managed an online multiplayer Minecraft Java server.

- Built, ran, and scaled a Java server to meet demand of up to 80 players at a time.
- Developed a marketing campaign to generate $1000+ of revenue through a custom e-commerce plugin.
- Hired and trained a 5-person team to address increased customer service requirements, enabling scalable growth.

Python Web Development: Used Python to automate home tasks and learn!

- Implemented a SQL backend, processing core, and web interface for a neural network running face and license plate detection to classify and store my live security camera feed, automating security notifications.

LEADERSHIP AND ACTIVITIES

- **Teaching Assistant:** Elements of Data Analytics for Machine Learning (Dr. Hazem Abbas, Winter 2025)
- **Clubs:** Canadian Undergraduate AI conference delegate, Queen's Formula SAE Team, and Rock-Climbing Club
- **Volunteering:** Chef and waiter at St. Francis Table, Housekeeper at Good Shepherd Ministries
- **Interests:** Podcasts, Formula 1, Small Engine Repair, Fishing, Aquariums, Bouldering, NFL, CAD / 3D Printing