Shilo Jeyaraj

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Education

University of Waterloo — **Waterloo, ON**
- *Bachelor of Applied Science in Mechatronics Engineering* — Expected April 2029
- **Relevant Courses:** Data Structures and Algorithms, Algorithm Design and AnalysisDigital Computation, Circuits, SolidWorks/CAD

Skills

- **Programming Languages:** Java, Python, C/C++, HTML, JavaScript, TypeScript, SQL, Bash, Swift, JSON, LaTeX, MATLAB
- **Software & Frameworks:** Git, Docker, Flask, FastAPI, React, Next.js, Node.js, Supabase, PostgreSQL, LangChain, OpenAI API, TensorFlow, PyTorch, OpenCV, Pandas, NumPy, MediaPipe, ROS 2, REST APIs, NLP, AWS, Linux/Ubuntu, VMWare, Claude, Vercel
- **Mechanical:** AutoCAD, SolidWorks, Ansys, Autodesk, VEX Robotics, PCB Design, Soldering, Machine Shop Familiarity

Experience

Friedmann AI — **Sept 2025 – Present**
Software Engineering Intern
- Improved backend efficiency by refactoring critical services, reducing system latency by **15%** and supporting scalable architecture
- Built and maintained automated testing pipelines with integrated **security features**, decreasing regression issues by **30%** and strengthening system reliability
- Developed real-time **backend and frontend tools**, streamlining internal workflows and enabling faster feature delivery
- Prototyped and benchmarked **Retrieval-Augmented Generation (RAG) models**, enhancing product accuracy and informing future AI-driven capabilities
- Authored internal documentation and workflow guides, boosting cross-team onboarding speed and knowledge retention

Normative — **Jan 2025 – April 2025**
Full-Stack Engineering Intern
- Built and enhanced Normative's internal site using Retool software and JavaScript programming, resulting in improved usability and accessibility for 30+ team members
- Created an OCR-based document processing system with **OpenAI APIs** to extract financial information from documents using Python backend programming and displayed the program using an **HTML CSS** frontend, boosting text recognition accuracy for scanned PDFs by **75%** for Normative's collaborative products
- Developed Normative's business proposal by training AI models using reinforcement learning through Python backend to optimize business proposals based on user prompts entered by company employees

Waterloo Aerial Robotics Group (WARG) — **Aug 2025 – Present**
Autonomy Team Member
- Increased drone navigation accuracy by developing **computer vision pipelines** with Python and machine learning models
- Improved landing precision and flight stability by optimizing autonomy algorithms for **object detection** and control
- Accelerated UAV system integration by collaborating with a multidisciplinary team to merge autonomy modules into larger drone platforms

Projects

Gym Posture Corrector (Real-Time Form Feedback System)
Tools: Python, OpenCV, MediaPipe, TensorFlow, Flask, HTML/CSS, JavaScript
- Building a real-time posture analysis tool using **OpenCV** and **MediaPipe** to extract skeletal data from live workout videos, enabling automated detection of exercise form
- Training a **TensorFlow** classification model on a custom-labeled dataset to distinguish good vs. bad form, with preliminary results showing over **92% accuracy**
- Developing a web interface with **Flask**, **HTML/CSS**, and **JavaScript** to deliver instant, actionable feedback to users, aiming to reduce form errors by **60%** based on user testing

Semantic Search & RAG Elective Planning Platform
Tools: Next.js, TypeScript, PostgreSQL (pgvector), Supabase, LangChain, OpenAI GPT-4o-mini, Python
- Developed a Retrieval-Augmented Generation (RAG) system with **550+ courses** ingested into a pgvector database, enabling sub-second semantic search and context-aware recommendations
- Built and deployed a full-stack platform with **Next.js + Supabase**, integrating JSONB filtering and multi-stage retrieval pipelines to improve discovery efficiency by **40%**
- Enhanced student course selection through a natural language chat interface powered by **GPT-4o-mini** and LangChain memory

Value Proposition Design Prompt Optimization
Tools: Python, OpenAI API, HTML/CSS, JavaScript, Flask, Claude, Gemini, Node.Js
- Designed a Python framework to evaluate and optimize prompts used for generating AI-driven value proposition designs, integrated input with OpenAI's GPT model via API and developed an HTML interface for company use
- Increased proposal generation accuracy by **40%** and reduced manual editing time by **65%** by benchmarking over **250 prompt-input combinations** and implemented a scoring system to identify high-performing patterns

Nutrition/Fitness Plan Builder
Tools: Python, Flask, Gemini API, HTML/CSS, JavaScript
- Developed a program that allows users to input physical health data, fitness goals, and dietary restrictions and generates a personalized workout and nutrition plan with a **90%** satisfaction rate from users
- Integrated Gemini AI **REST APIs** along with a **Python Flask** backend to generate accurate prompts based on user info
- Grants users with a structured diet, budget, and fitness schedule to further aid them in accomplishing health goals