Jon Karakus

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EDUCATION

Queen's University **Sept 2019 – May 2024**
Hons. B.ASc. Electrical & Computer Engineering *Kingston, ON*

EXPERIENCE

World Star Tech. **Jan 2025 – Present**
Software Engineer (Robotics + Camera) *Toronto, ON*

- Engineered computer vision system (**C++**) using OpenCV, PyTorch, ONNX and SAM ViT-L for a laser marker product, which performs object segmentation and precisely aligns text and images to its orientation.
- Programmed a laser manufacturing system (**C#**) integrating a Meca500 6-axis robotic arm with dual camera machine vision for precise alignment. Improved manufacturing speed **by 1400%.**
- Developed 3D view for beam camera product (C#/.NET) using DirectX/WPF APIs for real-time mapping and interfacing.

Contextual AI **July 2024 – Jan 2025**
Hardware Specialist *San Francisco, CA*

- Generated large language model (LLM) evaluation reports, analyzing performance with parameter changes for semiconductor clients, including Qualcomm.
- Developed a text-based **schematic extraction** method using DETR for integration in post-training. This expands the model's ability to answer hardware-based prompts by further understanding schematic diagrams.
- Architected hardware component datasets to optimize Retrieval-Augmented Generation (RAG 2.0) model accuracy.

Queen's University | AMSP Laboratory **March 2024 – Present**
Machine Learning Researcher (Supervisor: Prof. Saeed Gazor) *Kingston, ON*

- Trained and optimized classifier models for emotion detection using Scikit, achieving ~85% F-score across 4 emotions.
- Developed a convolutional neural network (**CNN**) using TensorFlow (Python) and achieved an **~87%** F-score.
- Constructed a speech emotion dataset consisting of 1,200 samples under the supervision of the ethics board.
- Developed LMS noise cancellation algorithm for live recordings fed through the model pipeline.
- **Awarded 2nd** place and a scholarship prize among 60 undergraduate projects.

Thermo Fisher Scientific **May 2023 – Sept 2023**
Engineering Specialist Intern (Equipment Engineering Team) *Toronto, ON*

- Designed and executed test protocols for pharmaceutical manufacturing robots valued at **~$2 million**.
- Automated machine data collection with **SQL** saving **~10 hours**/week of technician time and eliminating human error.
- Assisted in managing **350+** engineering tasks and team capacity metrics using Power BI and Excel.

World Star Tech. **2021 – 2022**
Embedded Systems Engineer Intern *Toronto, ON*

- Developed a spectrometer instrument (C++) for manufacturing and quality assurance.
- Interfaced LCD, spectrometer head, encoders, and functional buttons with an ESP32 using **I2C** communication.
- Designed and produced a printed circuit board (**PCB**) using **KiCad** to connect all the spectrometer components.

Software Engineer Intern (Robotics)

- Programmed a Meca500 robotic arm (C#) to mount and UV-cure optical lenses and motors.
- Automated manufacturing process, driving a **$47,000** monthly revenue increase through increased part production.
- Designed a 3D-printed gripper and UV holder, improving the arm's versatility and assembly efficiency.

PROJECTS

Engineering Blog | Click "Engineering Blog" to see my additional projects!

SKILLS

Languages:	C++, Python, C#, C, SQL, MATLAB, Java
Technologies:	PyTorch, Scikit, OpenCV, TensorFlow, Pandas, Git, ONNX, JIRA
CAD Tools:	KiCad, SolidWorks, AutoCAD, Electric, LTspice, PSIM, Quartus
Lab Equipment:	Oscilloscope, Function Generator, 3D printer, Soldering
Architecture:	ARM Cortex-A76, ATMega328P, Tensilica Xtensa LX6, ARM Cortex-M4