Kyle Levy

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Technical Skills

- **Programming:** Python, C, Golang, TypeScript, Assembly, MATLAB, ROS, ROS2
- **Embedded Systems:** Arduino, ESP32, FPGA Programming, Embedded Linux
- **DevOps & Cloud:** Git, Kubernetes, Jenkins, Docker, NGINX, S3, OAuth2, OIDC
- **Hardware Design:** Solidworks, Fusion360, KiCAD, LTSpice, EasyEDA
- **Testing & Tools:** Oscilloscope, Soldering, 3D Printing, Simulink

Education

- **Queen's University** — Kingston, ON
  Mechatronics and Robotics Engineering, BASc.; GPA: 3.710/4.30 — *Sept 2021 — May 2025*
  - **Description:** A new discipline of engineering at Queen's University that combines electrical, mechanical, and computer engineering with a focus on robotics and autonomous systems.
  - **Relevant Courses:** Mechatronics and Robotics Design, Control Systems, Signals and Systems, Sensors and Actuators, Industrial Automation, Robotics, Electronics, Computer Networks, Numerical Methods & Optimization, Embedded Systems & Microprocessors, Computer Architecture.
  - **Awards:** Queen's University Excellence Scholarship, Dean's Scholar Award (1st, 2nd, & 3rd year)

Experience

- **MDA Space** — Brampton, ON
  Student Engineering Intern - Guidance, Navigation and Controls - AI Research — *August 2024 — August 2025*
  - **AI/Machine Learning & Computer Vision**: Spearheaded research, development, and presentation of cutting-edge AI methods for space industry applications, including anomaly detection, visual inspection, black-box optimization, and generative AI. Conducted extensive literature reviews on emerging AI technologies and translated research into practical implementations and potential corporate policy changes regarding the appropriate use of AI autonomy in a high-reliability sector with sensitive data concerns in space applications.
  - **Software Engineering & Backend Development**: Designed, implemented, and documented robust software projects for on-premise cloud infrastructure supporting Large Language Models (LLMs). Architected and integrated secure authentication protocols (oAuth2 & OIDC) and high-redundancy databases to ensure data integrity and accessibility at scale. Delivered a fully featured LLM front-end and infrastructure, incorporating key features for user interaction and data management. Developed and maintained APIs utilizing SQL databases for authentication and access control.
  - **DevOps & Infrastructure**: Established and maintained infrastructure tooling and DevOps processes on-premise. Designed and deployed a multi-node compute cluster that improved AI training speeds by up to 64x, reducing model training time from multiple days to under one hour. Automated CI/CD pipelines using Docker, Jenkins, and Kubernetes to facilitate rapid and reliable deployments. Implemented robust security measures including certificate management, proxy configuration, and authentication protocols.
  - **Robotics & Simulation**: Prototyped and implemented realistic simulations of real-world robotic hardware and interactions, leveraging simulation results to improve physical system performance and inform decision-making. Utilized results to guide the design and optimization of robotic systems. Ran scripts and piloted space grade robots in the lab to run experiments and collect data for AI projects.
  - **Technical Communication & Visualization**: Delivered clear and comprehensive technical documentation for various projects using modern tools (Confluence). Created impactful data visualizations (3d rendering, plotting, PCA analysis) to analyze experimental results and identify correlations between parameters, supporting data-driven decision-making.
  - **Data Parsing**: Engineered custom data pipelines and scripts to parse and process more than 100GB of data from diverse sources, creating a sustainable foundation for AI model training. Explored the implementation of safe agentic workflows for sensitive data with LLM tool calling and forked an open source project to extend its functionality.

- **QMIND (Disruptive Technology Organization)** Kingston, ON
  Project Manager *June 2023 — Apr 2024*
  Innovation Design Team Member *Sept 2022 — Apr 2023*
  - **Leadership**: Led a team of 4 members to build a custom chatbot alternative to be showcased at the CUCAI conference.
  - **Planning & Organization**: Developed multiple statements of work, a timeline for the project, contingency plans, and a method of execution to ensure project success.
  - **Communication and Teamwork**: Coordinated tasks with group members to work effectively and distribute the workload in a way that played to the strengths of each member.
  - **Technical Contributions**: Using Python, assisted with curating data, parsing data, model creation, and model training.
  - **Machine Learning**: Used SKLearn to tokenize the files, build, train, and implement Naive Bayes and Transformer models.
  - **Data Parsing**: Built programs in Python which parsed a dataset of over 250,000 code files that were used to train the model.

Technical Projects

- **Search and Rescue Rover**: Worked in a pair to develop a semi-autonomous mobile robot which would be used to navigate an environment autonomously and then be manually piloted to manipulate objects remotely. I specialized in the mechanical design of manipulators, electrical systems, wireless communication systems, control systems, and navigation algorithms.
- **Autonomous CO_2 Monitoring System**: Worked with a team to develop an autonomous mobile robot which detected the CO_2 levels in a room for air quality safety purposes. I specialized in using ROS to connect the Raspberry Pi with the Arduino and sensors and the navigation algorithm based on the LiDAR data.
- **Code Vulnerability Detection**: Worked with a team to develop a language model AI which could read PHP code and detect outdated algorithms that could cause security issues upon implementation. I specialized in data processing and parsed the SARD dataset using Python to pull the necessary information and restructure them into a Pandas dataframe. I also assisted in designing the model, which used transformers to detect code that follows the structure of the example 'bad' code.
- **Worksheet Generator**: Automated the process of making worksheets using a Python script and LaTeX to generate word problems with variable parameters and a solution sheet. I used this software when I worked as a teacher to generate worksheets and reduced the time it took to make worksheets from an hour to a minute.

Extracurricular

- **Photography**: Passionate about street, nature, and landscape photography, occasionally sharing curated work online.
- **Travelling**: I am always looking for new experiences! So far, I have travelled to Canada, the United States, South Africa, Costa Rica, and Peru. In future, I hope to continue travelling and documenting my experiences.
- **Volunteering**: Over the years, I have enjoyed volunteering some of my time in various ways. When I was younger, my parents encouraged us to help out at soup kitchens near the holidays. As a camp counsellor, I volunteered to work with special needs children to help them have a fun summer at camp and overcome some personal limitations.
- **Home lab**: I love to sit at home and experiment with different technologies. I have recently spent lots of time developing my home lab for various things such as ambient LEDs around my TV, robotic arms to do some small tasks, little mobile robots for fun, and a Linux server running media, home automation, games, and much more!
- **Self Learning**: I have recently completed an Introduction to Machine Learning Fundamentals course by the University of Washington. I also have completed many online courses for programming at various levels, PCB design, ROS fundamentals, and artificial intelligence.