Steven E. Kraine

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Education:

University of Cincinnati, Cincinnati, Ohio **May 2024**

- Bachelor of Science – Computer Engineering – GPA: 3.92/4.00
- Master of Engineering – Artificial Intelligence – GPA: 4.00/4.00
- University Honors Program

Experience:

R&D Engineer - Robotics and Automation, Ford Motor Company – Dearborn, MI **May 2024 – Present**

- Represented Ford in 5GAA working groups to negotiate alignment of international standards, successfully agreeing on a glide path to harmonize ETSI and SAE protocols.
- Architected and deployed an ETL pipeline for autonomous system data, migrating processes to cloud ecosystems to enable automated analysis and broader project accessibility.
- Managed supplier relationships for cellular installations to maintain OTA latency; collaborated with systems engineering to integrate permanent fixes for latency spikes into the core codebase.
- Developed KPI collection and reporting frameworks, providing upper management with actionable insights into system performance and communication reliability.
- Refactored embedded cellular software, reducing codebase size by over 60% while simultaneously clearing the high-priority bug backlog.
- Performed root-cause analysis on 100+ unique events, identifying unintended behaviors during live testing and directing corrective actions to workstream leads.
- Cultivated a cross-functional stakeholder network across the company to streamline and support future project proposals.

Computer Vision Co-op, Etegent Technologies – Dayton, OH **May 2023 – August 2023**

- Developed internal tools to streamline ML development workflows, enhancing efficiency in computer vision model creation and evaluation; optimizing some tasks to 5% of the original cost
- Trained models for object detection using overhead imagery, showcasing proficiency in computer vision tasks.
- Explored innovative data management solutions tailored for diverse and large-scale datasets commonly encountered in computer vision projects.
- Provided critical support to team members by assisting in the setup and management of slurm clusters for scheduled training jobs on remote resources, ensuring seamless model training processes.
- Delivered presentations on transformer models to the entire company and their practical applications in computer vision, demonstrating in-depth knowledge of cutting-edge techniques.
- Applied state-of-the-art techniques like Segment Anything and DINO, gaining hands-on experience with advanced computer vision methods.

Embedded Software Developer, ThorDrive inc. – Cincinnati, Ohio **Jan 2022 – May 2023**

- Led effort to evaluate INS sensors for reliability and accuracy by creating software interfaces for multiple sensors
- Implemented changes to localization software that reduced CPU consumption to 33% of original compute resources
- Developed Kalman filtering solution to improve localization reliability and speed
- Integrated ultrasonic sensors into ROS environment for near-field detection
- Investigated new computer system architectures that improved system reliability and safety
- Understood new sensors and integrated them into the current code base utilizing CAN communication
- Utilized Elastic Stack to build upon data collection pipeline

R+D Computer Vision Co-op, MHS Global – Louisville, Kentucky **August 2020 – August 2021**

- Developed a video annotation pipeline to gather valuable statistics on on-site robot performance
- Utilized Artificial intelligence for image annotation with the help of third-party APIs
- Designed and developed C++ application on Nvidia Jetson for object detection
- Performed tests and curated data into concise reports for testing software improvements

Skills:

- Working Proficiency – C/C++, Python, GitHub, Microsoft Office, ROS, Ubuntu
- Experienced – Linux shell scripting, Nvidia Jetson, Arduino/Raspberry Pi, PyTorch, INS, Kalman filters, Code Profiling, Code Optimization, Lidar, RGB cameras, CUDA
- Intermediate – Google Cloud Platform (Data management), CMake, Google Test, Soldering / Breadboarding

Involvement, Certifications, and Awards:

- **HKN Tau Chapter – President – Cincinnati, OH** **August 2022 – Present**
- **SRIDE Fellowship** **2023**
- **Bedford Express F.I.R.S.T. team – Programming Mentor – Temperance, MI** **May 2023 – Present**
- **Professional SCRUM Master I** **August 2023**
- **Dean's List** **2019, 2020, 2021, 2022, 2023**
- **Ford Blue Oval Scholar** **2019, 2020, 2021, 2022, 2023**

Research:

Undergraduate Researcher **April 2023 – Present**

- Simulated UWB sensors within ROS ecosystem to develop and test estimation and localization algorithms
- Engineered and manufactured sensor mounts for sensor network within the lab setting
- Studied estimation techniques and implemented a kalman filter with least-squares estimation for robot localization within a time-of-flight-based sensor network

Projects:

NSBE Innovatathon – 1st place **October 2023**

- Developed a new design overnight to solve a real world problem in the food service industry
- Presented our innovation to a panel of company employees
- Trained YOLO v8 in low-shot scenario with 30 images for identifying a single object from security camera footage

Self-Designed Automatic Storage Solution **September 2019 – Present**

- Competing with prototype in innovation challenges
- Utilizing skills acquired from classes and extracurriculars to develop a new idea for the self–storage industry

Super Capacitor Powered Go-kart **September 2019 – Present**

- Designed a super-capacitor bank by combining many capacitors in series and parallel to get desired voltage and capacitance.
- Successfully built 4 prototypes with BLDC motors and washing machine parts.
- Created a vehicle that could run for 20 minutes on a charge.

Algorithm Trading Bot **July 2019 – Present**

- Designed an algorithm to trade live commodities on the Stock Market for a profit
- Explored DQN RL algorithm for automated trading

Trojan Horse Key-logger **2023**

- Worked alongside a small team to catch keyboard input from the Linux kernel
- Utilized HTTPS requests for sending data to a back-end server

Literacy Assistant Tool – Hackathon Project 2nd place **2022**

- Quickly iterated over different technologies within 24 hours to develop a small prototype app
- Leveraged open-source and closed-source packages to perform speech-to-text and text-to-speech.

CNC machine **2019 – Present**

- Developed prototypes of machines that increased repeatability
- Utilized CNC machine for other prototypes and quick iteration of designs

Vending Machine Owner and Operator **2018 – 2019**

- Recognized a potential market for a vending machine
- Managed stocking, ordering, and maintenance of the machine

Compressed Air Small Engine Conversion **2020**

- Took advantage of micro-controller and hall-effect sensor to control compressed air engine
- Converted gasoline-powered engine into pneumatic-powered engine controlled by an Arduino

Honda Project Car **2019 – 2020**

- Learned valuable engineering skills in car design and repair
- Replaced many parts including the gas tank, radiator, brakes, timing belt, and suspension components

Solar Reflector **2020**

- Calculated the optimal parabola for a specific height of the mirror
- Achieved temperatures over 200 degrees Fahrenheit with just the sun.