Darren Dong

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EDUCATION

University of Michigan, Ann Arbor, MI
M.S.E in Computer Science and Engineering   **Expected: May 2027**
B.S.E in Computer Science with Minor in Electrical Engineering, GPA: 3.848/4.0   **Expected: May 2026**
Relevant Courses: Data Structure and Algorithms, Computer Vision, Artificial Intelligence, Machine Learning, Web Systems, Practical Data Science, Advanced Operating System, Natural Language Processing, Computer Security, Embedded Systems

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EXPERIENCES

University of Michigan, Ann Arbor, MI | *EECS 442 Computer Vision Instructional Assistant*   **January 2025 - Present**
- Developed homework assignments on neural networks and contrastive learning for a computer vision course (100+ students), enhancing both conceptual and practical skills.
- Held weekly office hours and provided prompt support on Piazza to reinforce lecture content and address student questions.
- Maintained the course website by updating links and resources, ensuring reliable access to current information.

Keurig Dr Pepper, Frisco, TX | *IT Automation Prompt Engineering Intern*   **June 2025 - August 2025**
- Piloting automated shelf image analysis with GenAI and computer vision to identify product voids and potential revenue loss; current testing focuses on optimizing image resolution and model accuracy.
- Designing and building an operator-support chatbot for the Allentown plant; early pilot aims for a 20% reduction in troubleshooting downtime and $300K in annual revenue growth based on projected OEE improvements.
- Collaborating with Google, Microsoft, and internal teams to evaluate open-source and multimodal AI tools, adapting strategies based on early user feedback and technical constraints.
- Delivering interim findings and technical demos to business leaders to inform future direction of AI adoption in manufacturing and retail operations.

University of Michigan, Ann Arbor, MI | *Research Assistant*   **May 2023 - August 2023**
- Assembled mechanical, electrical, and software components to create a professional, real-time greenhouse ventilation system.
- Achieved sub-2-second responsiveness to temperature changes and push-button interactions, with full shutter motion completed within 10 seconds of receiving a signal.
- Designed and built an affordable, sustainable greenhouse ventilation system (under $100) using durable, weather-resistant components; ensured easy assembly and public accessibility.
- Maintained regular communication with the supervising professor, collaborated effectively, and planned future phases, including wireless networking integration with ESP32.

PROJECTS

Soft Robotic Sensor with Embedded Light Control   **April 2024**
- Designed and built a lightweight, cost-effective soft robotic light sensor (~$30) using materials with high light transmission and an electrical system (LED, tubing, photodiode, low-pass filter) for accurate signal detection.
- Programmed a Raspberry Pi Pico to control motor speed based on detected light, implementing PID control for responsive, sensor-activated operation.

Virtual Memory Pager   **March 2025**
- Designed and implemented a C++ virtual memory pager supporting address space management, including swap/file-backed pages, copy-on-write, and dynamic swap sharing for parent and child processes.
- Managed page state and permissions with read/write, dirty, and referenced bits; optimized memory eviction using the clock replacement algorithm.
- Enabled core operations such as mapping, context switching, and forking, demonstrating a deep understanding of process isolation and OS-level resource management.

SLAM and Navigation of a Two-Wheeled Robot   **January 2024 - April 2024**
- Programmed a two-wheeled robot to autonomously explore unknown mazes using particle filter-based SLAM and LIDAR localization, achieving pose accuracy within 10 cm and 30°.
- Deployed A* path planning and real-time obstacle avoidance, enabling efficient and safe traversal of dynamic environments.
- Enhanced odometry precision by tuning motor controls with PID algorithms, minimizing movement error.
- Built real-time map and localization visualizations in RViz to monitor robot performance and identify unexplored regions.

Hovercraft Prototype   **February 2023 - April 2023**
- Developed and presented hovercraft design concepts to ensure successful flight and 50g payload capacity, selecting optimal materials and addressing constraints of two running motors.
- Built, simulated, and tested the prototype using cardboard and CATIA to analyze airflow; achieved a 797g mass (within 800g budget), 15W power output, and 8N lift.
- Enabled hovercraft to complete navigation challenges, achieving a straight line in 50 seconds and a figure-eight in 6 seconds during time trials.

SKILLS

Programming Languages: C++, Java, Python, JavaScript, SQL, C, HTML, CSS, Dart, Shell Scripting
Frameworks & Libraries: Git, GitHub, PyTorch, NumPy, Matplotlib, OpenCV, Pandas, Flask (REST API), React (SPA Development), Flutter, Jinja2