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

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.

PROJECTS

Network File System **April 2025**
- Designed and implemented a distributed file system supporting concurrent read, write, create, and delete operations using socket programming, enabling multiple client processes to interact with shared files reliably.
- Employed reader-writer and upgradable locks to maintain data consistency and ensure safe concurrent access under high load, preventing race conditions and deadlocks.
- Developed server initialization and directory structure management routines, including robust error handling, to support persistent file system state and reliable client-server interactions.

C++ Thread Library **February 2025**
- Developed a multithreaded library with preemptive scheduling and thread lifecycle management, enabling fair CPU allocation across multiple cores (SMP) in a simulated OS kernel.
- Implemented advanced synchronization primitives (mutexes with priority inheritance, condition variables) and integrated deadlock detection/prevention, RAII resource management, and interrupt-driven context switching for robust and efficient parallel execution.

Foundational Search Engine **November 2024**
- Built a distributed search engine using a custom MapReduce framework, scaling to process and index large web directories across multiple worker nodes with dynamic task reassignment and failure recovery.
- Implemented TF-IDF and PageRank algorithms to improve relevance and ranking of search results on live, regularly updated datasets.
- Developed an efficient query handling module with support for pagination, caching, and asynchronous API requests, creating a unified and fault-tolerant information retrieval pipeline.

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

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