Amr Hussein

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Education

University of Michigan **Ann Arbor**

Bachelors In Computer Science and engineering, Minor in Mathematics *Expected Winter 2026*

- **GPA:** 3.88/4.00
- **Selected Coursework:** Data Structures and Algorithms, Intro to Computer Organization, Fundamentals of Computer Science, Linear algebra, Calculus 1-3, Calculus-based statistics, Computer Security, Programming Languages, Operating Systems, Parallel Programming

Personal Projects

Pri-Render **6/2024**

- Implemented advanced rendering techniques including ray tracing, ray-triangle intersection, reflections, and materials
- Leveraged CUDA for more efficient parallel computation, achieving better render times and utilization
- Included support for texture mapping, anti-aliasing, imported models, Depth of field, and differing resolutions

Fractal Visualizer **8/2023**

- Created a Cuda-accelerated program that visualizes fractals such as the Mandelbrot and Julia set
- Produced Multiple Cuda-Compatible frameworks that increased user options for quality and speed
- Improved speed and memory usage with Nvidia Nsight while determining bottlenecks in the system

UC Compiler **3/2024**

- Designed and built a 6-phase semantic analyzing to build a source-source compiler for the uC24 language
- Leveraged Python's Inheritance and polymorphism to parse the Abstract Syntax Tree and generate corresponding code
- Utilized Object Oriented Programming techniques and template meta-programming to minimize bugs and created test cases to ensure that generated code complied with the UC Spec

Boid simulator **3/2024**

- Developed a swarm simulator in C++ known as as Boids to replicate the behavior of flocks of birds
- Created features like Predator-Prey interactions to more accurately simulate real life behavior
- Employed Cuda and parallelization to increase the iterations of the simulation within the same time

SQL simulator **4/2023**

- Engineered an enumeration of a relational database for data storage and retrieval that allows for efficient operations and filtering based on user supplied requests
- Utilized Hash Tables, BST's, Functors, and Comparators for efficient indexing and data management in C++

Team Projects

Auto-Mate **Ann Arbor, MI**

Software Development Lead *January 2024 - April 2024*

- Developed a cross-platform mobile application using React Native and Tailwind that assists users with car maintenance scheduling, reminders, and tracking
- Integrated Firebase Authentication and Firestore to manage user accounts, securely store maintenance records, and sync data across devices
- Collaborated with a cross-functional team including designers and backend developers to deliver an engaging Interface

3D-organizational-chart **Ann Arbor, MI**

Software Team Member *November 2023 - March 2024*

- Developed a JavaScript application for rendering interactive 3D objects, resulting in a dynamic and visually engaging UI
- Designed and integrated a real-time data visualization system to dynamically update the scene based on user inputs
- Implemented custom algorithms to sort and organize 3D objects into a hierarchical tree structure

Technical Skills

Languages: C++, C, Dafny, Python, ArmV8, Javascript, HTML
Developer Tools: Github, Git, VScode, Docker, Linux, Makefiles
Technologies/Frameworks: Cuda, Vulkan, Visual Studio, OpenCV, Numpy, Pandas, Slack, Latex, React, Tailwind, Agile
Awards: Engineering Deans list(2023),University honors(2023)