Mohammed Ajabnoor

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Education

University of Michigan Ann Arbor, MI

Bachelor of Science in Computer Engineering and Computer Science, GPA: 3.92/4.00 *Aug. 2021 – May 2025*

Coursework: Data Structures and Algorithms, Machine Learning, Computer Vision, Computer Security, Computer Architecture, Computer Organization

Future Courses: Natural Language Processing, Web Systems, Operating Systems

Honors: KAUST Gifted Student Program Scholarship, James B. Angell Scholar, University Honors

Experience

University of Maryland REU-CAAR College Park, MD

Research Intern, Optimizing K-Means for high-dimensional datasets *June 2023 – August 2023*

- Optimized K-means clustering algorithm by integrating state-of-the-art techniques from academic research, notably using the triangle inequality and ball clustering to establish bounds, reducing distance calculations by 45%
- Achieved a 960% speedup in our codebase through implementing parallel algorithms, witnessing a linear performance boost proportional to core count, realizing a 96 times acceleration with 96 cores
- Regularly conducted progress presentation with mentors to review our current algorithm, discuss different techniques, and identify code segments for parallelization, optimizing our code and refining the final presentation

University of California at Irvine Irvine, CA

Lab Intern, Engineering a Wearable Fitness Tracker Device *July 2022 – August 2023*

- Led a team in an industry-adjacent project using Arduino, soldering, and 3D printing to create a detailed wearable fitness tracker for steps and flight of stairs
- Achieved 95% accuracy in step tracking and developed a user-friendly mobile app interface

Projects

Discord Bot Developer (Personal Project) | *Python, REST API, Web scraping* *August 2023 – Present*

- Developed a Discord bot that enables users to vote for their favorite video based on a compilation generated from the top three videos, based on message reactions, sent to the channel in the past week
- Integrated YouTube's API and employed web scraping techniques to extend support to websites without direct APIs, enabling the fetching and downloading of video clips from a broader range of sources
- Designed an automated workflow to combine videos, overlay text, and adjust video formats using Python and associated libraries such as OpenCV and MoviePy

Dog Breed Image Classification | *Python, Scikit-learn, PyTorch, TensorFlow* *March 2023*

- Engineered a convolutional neural network model to distinguish among 11 distinct dog breeds, optimizing hyperparameters to achieve an AUROC score of 86.3%
- Utilized GRAD-CAM to visualize areas in images that most influenced the CNN's predictions, revealing vital distinguishing features crucial for model interpretability
- Combined transfer learning from auxiliary datasets with data augmentation techniques, fortifying model robustness and guaranteeing stable performance across a wide range of inputs

Digital Computer Forensics | *Cryptography, Injection attacks, GDB, Ghidra* *April 2023*

- Tasked with forensic analysis of a hard drive using Autopsy to ascertain an individual's potential criminal activity
- Demonstrated proficiency in steganography, ciphers, Diffie–Hellman key exchange, buffer-overflow, cross-site scripting, brute force password cracking, SQL injection, length-extension attack, and Ghidra tools

Cache simulator | *LC2K, C* *December 2022*

- Implemented a cache simulator in C that interprets assembly instructions, efficiently converting and processing them within the program to simulate cache behavior and count hits and misses

Machine-Learning Piazza Classifier | *C++* *April 2022*

- Developed a program with natural language processing and machine learning to auto-categorize course forum posts
- Enhanced data accessibility post-training using binary search trees and maps

Technical Skills

Languages: C/C++, Python, Java, MATLAB, Verilog, VHDL, LC2K, x86

Technologies/Libraries: PyTorch, TensorFlow, Scikit-learn, Arduino, Matplotlib, Git, Docker, CAD, Unix, Nano