Mahir Kaya

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EDUCATION

The University of Texas at Austin, Austin, TX   **May 2026**
Bachelor of Science in Computer Science, GPA 3.9075
Relevant Coursework *Data Structures, Computer Organization and Architecture, Discrete Mathematics, Machine Learning from Coursera, Intro to Probability and Statistics, Linear Algebra*

EXPERIENCE

Student Researcher for Spark Research Lab with Dr. Mohit Tiwari   **March 2024 - Present**
- Involved in **Cybersecurity** and **ML** research on the utilization of Reinforcement Learning to generate algorithms to identify eviction sets for different randomized caches such as 4 set, 2 way caches and training existing RL models for **40>** epochs to test the current methods

Research Assistant at UT Austin for Henkelman Group   **August 2023 - October 2023**
- Researched partitioning an **A100 GPU** Node for concurrent VASP calculations.
- Implemented a **VASP** Force Field Machine Learning Algorithm and gathered data of Bayesian and Root Mean Squared Error of Forces for several compound molecules such as **H4_3H2O**, **4H2O**, and **3H20**

Software Engineer at FAIK.AI   **May 2023 - August 2023**
- Developed a HIPAA compliant Android app which diagnoses glaucoma from a USB microscope.
- Implemented a frontend with **Kotlin** and **Firebase** and backend with **Python** and **Docker**.
- Implemented computer vision algorithms and trained object detection models in order to track eye movement and detect user error as well as created datasets and labeled around **500** images for object detection models.

Student Researcher at UT Austin HSRA   **June 2022 - July 2022**
- Developed a modified gradient descent algorithm to discover the optimum catalyst by converging on the combination of atoms that has minimum binding energy with hydrogen with **Python**
- Used binding energies found by chemical calculations to calculate *2 gradient matrices* for **3** binding atoms and **76** atoms

PROJECTS

- **Systems Emulator:** Developed a software emulation of a *5-stage CPU with simple two level memory hierarchy* and integrated cache that can run the charm-v3 instruction subset of ARM Assembly code. Implemented multi-stage pipelines and LRU algorithm for evicting a cache line to increase performance as well as programmed an ALU (Arithmetic Logical Unit) which was integrated into the pipeline using **C**
- **JP Morgan Chase Virtual Engineering Program:** Fixed broken files in the repository to make web application output correctly and used JPMorgan Chase's open source library called Perspective to generate a live graph that displays a data feed in a clear and visually appealing way for traders to monitor.
- **Memory Manager Program:** Built and optimized a dynamic storage allocator for **C** programs that has up to **85%** space utilization and an average throughout over **1400** by partitioning memory blocks gotten from the **OS** and sharing them with the user accordingly. The program semantics matches the standard *malloc* and *free* routines.
- **Huffman Compressor:** Implemented the Huffman Coding Compression Algorithm to compress large files with **40%** compression rate for text files without any data loss using **OOP** techniques
- **Minesweeper AI Agent:** Constructed a knowledge-based AI agent able to take actions and make inferences based on a knowledge base consisting of previous moves to play Minesweeper game using **Python**

TECHNICAL SKILLS

- **Languages and Technologies:** Python, Java, C, Arm Assembly, Octave, Kotlin/Matlab, HTML, Prolog, YOLOv8, Firebase, VASP**,** Docker, Git, Linux, Numpy, Matplotlib, Tensorflow