





# Muhammad Abdullah

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## Education

**Massachusetts Institute of Technology**

*Candidate for B.S. Computer Science and Engineering*

Class of 2024

- Relevant Coursework: Performance Engineering, Distributed Computing, Operating Systems, Security

*Candidate for B.S. Mathematics*

Class of 2024

- Relevant Coursework: Advanced Algorithms, Theory of Computation, Linear Algebra, Probability

## Work Experience and Research

- **MIT Computer Architecture and Security Lab** Jan. 2022 - present  
*Morais and Rosenblum Undergraduate Research Scholar*  
Implemented a modified KVM module in the Linux kernel to support Trusted Execution Environments (TEEs).  
Developed implementation using C, RISC-V, and hardware primitives for sub-OS layer support.  
Examined the provision of OS/hardware level cryptographic security assurance for VMs on cloud servers.
- **Rescale, Inc.** Jun. 2022 - Aug. 2022  
*SW Intern*  
Implemented a High-Performance Data Analysis pipeline to showcase cloud management systems.  
Developed a dynamic process management solution using Message Passing Interface for distributed systems.  
Conducted platform reviews and offered optimization recommendations to company teams.
- **MIT Kavli Institute** Jun. 2021 - Jan. 2022  
*Undergraduate Researcher*  
Developed a Machine Learning classification system in Python for analyzing TESS space telescope's data.  
Built an AI-driven ensemble of three ML models incorporating techniques such as HDBSCAN clustering, Isolation Forest anomaly detection, and t-SNE dimensionality reduction.  
Achieved efficient data management with an x8 size reduction, preserving accuracy at 95%.

## Projects

**OneChan**: An FPGA-based Chess Engine supplemented with a custom TPU. [link](#)

**U2F**: An open source, homemade 2-factor authentication security key based on the FIDO alliance's U2F specification [link](#)

**Profemon**: A dynamic, pvp, in-person, turn-based fighting game similar to Pokemon Go. Implemented on an ESP32 [link](#)

**Depolarizer**: React app that suggests news articles and sources to promote exposure to opposing viewpoints. [link](#)

**MIT 6.854 Final Project**: Reviewed and simplified several recent keystone papers in Data structures and Algorithms. [link](#)

## Skills Summary

**Languages**: Extensive experience in C, C++, Python, Typescript, Assembly, System Verilog

**Tools**: Git, Linux, React, Angular, sk-learn, Pytorch

**Interests**: Performance Engineering, Security and Computer Architecture

## Awards

International Mathematical Olympiad 2020 (IMO) - Honorable Mention  
6.172 (Performance Engineering) Leiserchess Tournament 2022 - Final Winner