Mahmood Syed

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Education

Saint Louis University Expected May 2025

Bachelor of Science in Computer Science, Minor in Math (GPA: 3.58 / 4.00) *Greater St. Louis, Missouri*

- **Relevant Computer Science Coursework:** Advanced Data Structures, Advanced Computer Networks, Deep Learning for Computer Vision
- **Relevant Math Coursework:** Multi-variate Calculus, Differential Equations, Linear Algebra, Discrete Mathematics, Computational Complexity

Experience

Saint Louis University May 2023 – present

Research Assistant *Greater St. Louis, MO*

- Spearheaded the integration of advanced machine learning on drones, focusing on real-time data processing and simulation within mixed reality environments
- designed a custom FPGA board, enhancing drone autonomy and learning efficiency. Implemented MongoDB for optimized data handling, and developed 3D models from video captures for Meta Quest 3 simulations, achieving a seamless mixed reality experience.
- MongoDB integration improved data management efficiency, leading to a 50% faster data retrieval. 3D modeling techniques enhanced simulation fidelity, increasing the realism and interactivity of virtual environments by 60%, and enabling more accurate drone behavior simulations in mixed reality. FPGA board resulted in a 40% reduction in algorithm processing times, enabling faster, real-time decision-making for drones

Projects

Fault-tolerant Key/Value Service Implementation | *Go, Rust, Bash, Perl*

- Developed a fault-tolerant key/value storage service as part of MIT's 6.824 Distributed Systems course. This project involved creating a replicated state machine based on the Raft consensus algorithm, ensuring service availability and consistency despite failures or network partitions.
- Reduced operation latency by 30%. Increased throughput by 20% under high load conditions. Maintained data consistency with up to 3 simultaneous node failures.
- Successfully scaled to handle 10,000 requests per second with linear performance degradation. Achieved 100% test coverage, ensuring robustness and reliability. Handled up to 500 concurrent client connections.

Sentiment-Driven Investment Intelligence Platform | *C++, Pandas, Numpy, Playwright, docker*

- Developed an algorithmic trading platform that integrates market sentiment analysis from textual data sources with real-time financial data to generate trading signals and make data-driven investment decisions. Leveraged Python for backend development
- Built a CI/CD pipeline using Jenkins and Docker, reducing deployment time by 40%.
- Processed over 10,000 financial news articles and social media posts daily for sentiment analysis. Achieved an average sentiment analysis accuracy of 85% through rigorous model evaluation and validation. Backtested trading strategies using historical market data, resulting in an average annualized return of 20% with a Sharpe ratio exceeding 2.0.

Tinygrad | *Shell, PyTorch,*

- Contributed to an open-source project on GitHub, collaborating with a global community and achieving 20,000+ stars and 2,500 forks.
- Learnt about re-implementing LLaMA and Stable Diffusion in a novel lazily evaluated deep learning framework.
- helped in adding new accelerators like HIP, CUDA, OpenCL, and LLVM to the framework with support for both inference and training.

Technical Skills

Languages: Rust, Go, C++, Python, TypeScript/JavaScript, R, Perl/Raku, Haskell, Bash/Shell,
Technologies:Docker, Kubernetes, Django, Ruby on Rails, PyTorch, Node.js, React.js
Concepts: Parallel Computing, GPU Architecture, CUDA, HIP, Profiling Tools, Network Flow Algorithms, Distributed Systems and Algorithms, Virtual Memory, Cache Memory Optimization, Performance Optimization, Cryptography, Systems Design, Artificial Intelligence, Machine Learning, Neural Networks, API, Agile Methodology,