Gunasekar

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Summary

Motivated Computer Science Student with a strong passion for innovative problem solving and technology. Eager to contribute to challenging projects, solve complex issues, and gain hands on industry experience. Seeking a dynamic role that allows me to grow, make a significant impact, and build a successful, long-term professional career.

Education

Panimalar College of Engineering, Chennai Jul 2022 - Apr 2026
Bachelor's in Computer Science and Engineering
Relevant Coursework: Object Oriented Programming, Data Structures and Algorithms, Operating Systems, Database Management Systems, Software Engineering, Compiler Design, Machine Learning

Skills

Languages: C/C++, Java, Mojo

Frameworks & Tools: LLVM, MLIR, CUDA

Platforms & Tools: Linux, Windows, Raspberry Pi

Development Methodologies: Agile, Waterfall

Spoken Languages: English, Tamil, Telugu

Work Experience

VCODEZ, Chennai Jan 2025 – Mar 2025

Machine Learning Intern

- Completed a 3-month internship focused on real-time machine learning projects.
- Developed hands-on experience in data preprocessing, model training, and deployment workflows.
- Demonstrated strong professional conduct, task ownership, and problem-solving skills.
- Received official recognition for excellent performance and outstanding character.

Project Work

- **MOJONET:** Built a high-performance deep learning framework entirely in Mojo, from the ground up. Implemented core tensor operations, automatic differentiation (autograd), and neural network layers. Optimized execution across CPU and GPU via low-level integration with cuBLAS and cuDNN. Designed a PyTorch-compatible API to ensure seamless model migration and developer adoption.
  (Technologies: Mojo, Python, PyTorch API, Deep Learning, MLIR, LLVM, cuBLAS, cuDNN)

- **STDTYPE:** Designed a custom MLIR dialect that unifies scalar, array, pointer, and composite types under a single type system. Enabled compiler engineers to standardize type manipulation and lowering across heterogeneous backends. Integrated with LLVM IR using TableGen for extensible type and op definitions.
  (Technologies: C/C++, Python, MLIR, LLVM, Tablegen)

- **SHELL INTELLIGENCE:** Developed an AI-integrated terminal interface for Linux, allowing natural language interaction with system commands. Implemented real-time LLM inference via Ollama, enabling conversational shell access. Optimized UX and response latency while supporting offline model hosting.
  (Technologies: C/C++, Large Language Model, Transformer Architecture, Ollama, Bash, Linux)

- **MCCL:** Created MCCL(Mojo Cuda Collective Library) a CUDA compatible GPU acceleration library for the Mojo language. Designed low-level abstractions for GPU kernel launching via NVRTC and PTX. Enabled Mojo developers to write GPU compute kernels with minimal overhead, bridging CUDA ecosystems with Mojo's MLIR-based compiler pipeline.
  (Technologies: C/C++, Python, Mojo, CUDA, NVRTC, PTX, cuBLAS, cuDNN, MLIR, LLVM)

Open Source Contributions

- **[Feature] Direct GPU Kernel Definitions in Mojo**: Proposed native syntax for defining GPU kernels directly in Mojo inspired by CUDA kernel launch semantics.
- **[Feature] Support `__mlir_fold()` for Constant Folding**: Requested compile-time constant folding support to enhance Mojo expressiveness and reduce runtime overhead in MLIR-based pipelines.
- **[Bug] Parameterized Type Failure in `!llvm.array`, `!llvm.ptr`**: Identified bug in Mojo's type system where LLVM IR dialect types failed when parameterized. This uncovered internal compiler limitations for type construction.
- **[Bug] Crash with Recursive Struct Instantiation**: Reported a compiler crash when defining a nested struct containing a field of its own type, A critical issue for data structure recursion support in Mojo.

Volunteering and Leadership

IEEE Jan 2024 - Jan 2025

Coordinator

- Organized technical workshops and seminars to enhance student learning and professional development
- Developed initiatives to increase member participation and engagement in IEEE activities
- Competed in IEEE Extreme 24-hour coding event and achieved 1st place at campus level
- Assisted with fellow IEEE coordinators in organizing and running campus-level technical events

Neuro Nexus Jul 2023 - Jul 2024

Coordinator

- Assisted in designing and implementing hackathon programs focused on neural networks and AI
- Coordinated club volunteers and managed event logistics for technical competitions
- Facilitated knowledge sharing sessions on emerging technologies in AI and machine learning

Technical Writing

- **"LLMs (Large Language Models)"** — *Gunasekar S D*, Medium (2024)
  An insightful blog on Large Language Models, exploring their core architecture, real-world applications, and future potential — tailored for students, developers, and AI enthusiasts alike.
- **"Guide for Dataset Preparation"** — *Gunasekar S D*, Medium (2024)
  A practical walkthrough on collecting, cleaning, formatting, and splitting datasets for deep learning models. Includes tooling suggestions and tips for reproducible workflows.
- **"Mojo, The Next-Gen Programming Language"** — *Gunasekar S D*, Medium (2025)
  A technical introduction to Mojo, exploring its capabilities in systems programming, AI, and GPU acceleration. Ideal for those looking to explore Python like syntax with C level performance.

Achievements and Recognition

- **IEEE Extreme Programming Competition:** Secured 1st place at department level in the IEEE Xtreme 24-hour international coding competition
- **Student Coordinator:** Awarded for dedication and teamwork during PECTEAM2K23 at the 6th International Conference, Panimalar Engineering College.
- **Workshop on Societal Implications of AI & Robotics:** Participated in a two-day workshop conducted by Vellore Institute of Technology, Chennai in collaboration with Dr. Fiona Carroll, Cardiff Metropolitan University, UK (April 2023)
- **Best Project Award – PECTEAM2K23:** Recognized for "ONI (Open Network Intelligence)" at the 6th International Conference for Phoenixes on Emerging Trends (April 2023)
- **Data Science for Beginners – Gold Level:** Scored 89% in FutureSkills Prime certification exam (Certification ID: FSP/2023/11/5165941)
- **Evento De Tecnología'24 Volunteer:** Recognized as a coordinator by IEEE Computational Intelligence Society (September 2024)
- **Jarvis'23 – National Level Symposium:** Participated in a Mechatronics-led tech event at Chennai Institute of Technology (September 2023)
- **Technical Leadership:** Successfully coordinated multiple technical events and workshops as Neuro Nexus coordinator