Krishna Praneet Gudipaty

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EDUCATION

University of Massachusetts Amherst — **Amherst, MA**
Doctor of Philosophy (Ph.D.) in Computer Science, GPA: 4.0/4.0 — May 2027 (Expected)
Master of Science (M.S.) in Computer Science, GPA: 3.97/4.0 — May 2024

Indian Institute of Technology Madras (IIT Madras) — **Chennai, TN**
Bachelor of Technology (B. Tech.), GPA: 8.75/ 10.0 — Dec 2020

Relevant Coursework: Data Structures and Algorithms, Software Engineering, Advanced Algorithms, Distributed & Operating Systems, Secure Distributed Systems, Systems for Data Science, Advanced Machine Learning, Reinforcement Learning, Information Retrieval, Quantum Information Systems

RELEVANT EXPERIENCE

Center for Quantum Networks (CQN) — **Amherst, MA**
API Endpoint Developer — Feb 2024 – May 2024
- Designed a REST API server utilizing **Oxygen.jl** framework to enable programmatic access to a quantum network simulator
- Integrated HTTP endpoints for manipulating qubit registers and gates across nodes in the network using **QuantumSavory.jl**

Deskera — **Remote**
Software Development Engineer (Full-stack) — Dec 2020 – Jul 2022
- Developed **RESTful** microservice-based webhooks for enhancing business sales, inventory, and invoicing operations
- Engineered a web application using **Java** and Spring for integrating online shopping stores to Deskera applications
- Automated the reconciliation of orders and payment data across various e-commerce platforms with live updates
- Achieved a **30% improvement** in runtime with multi-threading and asynchronous event processing using **Apache Kafka**
- Designed a responsive UI dashboard using **React** and Redux for shop configurations, data filtering, and summarized insights

Publicis Sapient — **Bangalore, KA**
Software Engineer Intern (Full-stack) — May 2019 – Jul 2019
- Built a trading web application using **Java** and Springboot, leveraging **RESTful** microservices and agile SDLC techniques
- Implemented token-based user authentication using **JWT** for role-based access control to fund entitlements and trading
- Designed user portfolio UI using **React** and Materialize CSS for managing assets and querying entitled funds in real-time

RELEVANT PROJECTS

Stock Trading Server — Feb 2023 – May 2023
- Built a 3-tier stock trading server using **Python** to handle requests from various clients using a **thread-pool** model
- Designed replication logic with bully leader algorithm for graceful failures and to maintain consistency among replicas
- Implemented **LRU caching** at the top-level frontend service, reducing the latency of stock lookup requests by **20%**

Stock Prediction System — Feb 2023 – May 2023
- Developed a stock prediction system using **Python** to analyze historical time series data using **Apache Spark** and **PyTorch**
- Implemented LSTM, Random Forest, and Factorization Machine models from **SparkMLLib** to predict stock closing prices

Elevation-based Navigation System (EleNa) — Oct 2022 – Dec 2022
- Built a navigation app using **JavaScript** and **React** that suggests the shortest path between two user-defined locations
- Implemented **Dijkstra's** and **A*** algorithms to calculate routes in a weighted graph with minimal elevation gain

RELEVANT RESEARCH

Software Library of LDPC Decoders for Quantum Error Correction — **Amherst, MA**
UMass Amherst — Jun 2023 – Present
- Working on enhancing the speed and performance of LDPC decoders for error-correcting codes in quantum networks
- Developed and published LDPCDecoders.jl library in **Julia** consisting of popular code generators and syndrome decoders
- Improved performance by **20%** for belief propagation decoder by implementing post-processing using error probabilities

Accelerating Ab-initio Molecular Dynamics simulations using Machine Learning — **Chennai, TN**
IIT Madras — Aug 2019 – May 2020
- Researched non-linear Machine Learning based frameworks for accelerating Ab-initio Molecular Dynamics simulations
- Developed a numerical fingerprinting algorithm to capture translation and rotation invariance in 3-D data and to transform it into feature vectors, which enabled statistical predictions of Platinum force fields based on molecular arrangements
- Achieved mean performance of **99.5%** accuracy in predictions for over 6 configurations for Platinum nanoclusters in various environments, and a computational speedup of nearly 40% over conventional simulations on an IBM cluster

RELEVANT TEACHING EXPERIENCE

Grading Assistant — **Amherst, MA**
Distributed and Operating Systems, UMass Amherst — Feb 2024 – May 2024
- Assisted the course instructor in grading assignments, labs, and exams for a graduate-level class of **100+** students
- Held virtual office hours for code reviews and answering discussions on Piazza to help students with hints and concepts