Rithvik Reddy

+1-737-977-1424
Website linkedin.com/rithvikreddyspinors rithvikreddy@utexas.edu github.com/spinorssuck

Education

The University of Texas at Austin Expected May 2024
Bachelor of Science in Mathematics

Relevant Coursework

Courses: Graduate Data Structures and Algorithms, Software Design and Implementation II, Graduate Probability Theory, Linear Algebra (Hon.), Real Analysis II, General Relativity, Quantum Mechanics II
Awards: 4-time recipient of highly competitive Out-of-State Tuition Waiver, CNS Deans' Scholar Anna Lee and Alexander Chung Endowed Scholarship

Summary

Undergraduate mathematics major with history in academic research interested in applying background in abstract problem-solving to software development and data science. Interested in back-end development, machine learning, computer vision, quantum computing, probability theory, statistics, data science.

Skills

Programming: C/C++, Python, SQL, Java, MATLAB, Javascript, R, Linux
Frameworks, Tools: Pandas, PyTorch, Git/GitHub, Unix Shell, Django, TensorFlow, React, Node.js, Azure

Projects

SpinorTracer - Path Tracer, Ray Tracer Engine | *C++, Git, CUDA* Feb. 2023 - Present
- used mathematical physics, C++ to build a path tracer-ray tracer engine with multiple levels of optimization, increasing performance rate by 750% over naive implementation. (Ray and path tracers are often used for image rendering, modeling light transport in video games, and the film industry)
- employed state-of-the-art algorithms for fast model rendering, precision improvements in ray-sphere interactions, optimized importance sampling and adaptive ray tracing for improved anti-aliasing.
- currently working on extending the project to real-time rendering(at GPU level) using NVIDIA's CUDA, Vulkan and other tools, exploiting greater GPU parallelization and optimizations.

Credit Card Fraud Detection - Machine Learning | *Python (data analysis), Pandas, scikit-learn* Sept. 2022
- analyzed credit card transaction data for fraud classification using multiple optimized supervised learning pipelines, using Random Forest Classifiers, Logistic Regression, prioritized oversampling techniques for K-NN-like algorithm improving precision by 30% over a naive implementation.
- also used unsupervised learning techniques like Density Based Spatial Clustering and K-cluster means to classify credit card transactions

Spinor Chat App | *Java, IntelliJ IDE* Aug. 2020
- Created a real-time chat app conforming to Rest API architecture using Node.js, Express.js to build back-end server-side logic and maintained databases using PostgreSQL
- implemented concepts like multi-threading, OOP, containerization(using Docker) and a simple UI using ReactJS. Also implemented server-side authentication logic and password hashing for secure authentication.

Experience

UT Quantum Collective | *Director of Research* Sept. 2022 – Jan 2024
- Organized research and learning groups in quantum computing for undergraduate students
- Gave lectures on developments in quantum computing and related topics - quantum complexity, topological materials, quantum entanglement, IBM Qiskit
- Helped organize multiple events like the quantum S.Q.U.I.D conference, UT Quantum Hackathon

Math Department | *Math Research on Tropical Moduli Spaces* Jun. 2021 - Aug 2021
- conducted mathematical research on tropical moduli spaces, stable tropical curves in the intersection of algebraic topology and algebraic geometry, studying cohomological and representation-theoretic aspects of Kontsevich's graph complex.