Deep Patel

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Education

Carnegie Mellon University - School of Computer Science	Sep 2020 - Expected December 2024
Bachelors of Science in Artificial Intelligence	4.0/4.0

Selected Coursework:

- Operating Systems: Design & Implementation, Distributed Systems, Parallel Computer Architecture and Programming
- Advanced Deep Learning, Machine Learning with Large Datasets, Visual Learning & Recognition

Experience

Duolingo — Software Engineer Intern
May 2023 - Aug 2023

- Developed screenshot verification software in Android Espresso instrumentation tests for the Duolingo Learning App
- Automated UI verification procedure within multiple Jenkins pipelines triggered by Github webhooks
- Facilitated discussions regarding new features to add to the screenshot verification infrastructure to improve usability

Omnicell — Software Engineer Intern
May 2022 - Aug 2022

- Evaluated large-scale machine learning models in Python for binary classification on over 33M pharmacy item names
- Integrated trained models into a production Scala code base using Apache Spark's ML and SQL libraries
- Communicated progress in daily stand-up meetings following the Scrum Agile framework

Language Technologies Institute — Research Intern
Feb 2021 - Aug 2021

- Enhanced dialogue systems to perform domain-specific conversation on social engineering scams
- Increased information extraction from scammer emails through natural language processing techniques
- Lead and presented progress in collaborative, biweekly meetings

Projects

Carnegie Autonomous Racing Club — Perceptions Team Lead
Feb 2022 - Present

- Led and managed development of robust LiDAR and stereo-vision object detection pipelines implemented in C++ and ROS
- Developed a point cloud parser for LiDAR UDP packet stream in Python using socket programming
- Managed team of student engineers to facilitate development and achieve goals

N-Body Simulation – High Performance Computing Algorithms
March 2023

- Integrated quad-tree data structure to improve simulation algorithm performance over naive algorithm
- Parallelized quad-tree algorithm over 64 CPU nodes using OpenMP and MPI to obtain a near-linear, 62 times, speedup
- Developed load-balancing techniques to encourage uniform work across threads and improve hardware utilization

CUDA Circle Renderer – GPU Accelerated Software
Feb 2023

- Utilized NVIDIA RTX 2080 GPUs, CUDA, and C++ to accelerate program execution by over 100 times speedup
- Performed profiling with gprof and perf to analyze execution bottlenecks and determine areas for optimization
- Efficiently utilized GPU local and shared memory to minimize communication requirements

Distributed Bitcoin Miner – Network Protocol Project
Sep 2022

- Designed and wrote a TCP protocol to facilitate communication between client and servers in a distributed system
- Enhanced server efficiency and robustness via light-weight multi-threading using Go's coroutine system
- Improved load balancing utilizing a task scheduler to improve parallelism and overall mining performance

Skills

Programming Languages	Python, C, C++, CUDA, Kotlin, Go, Java, MATLAB, Julia, JavaScript
Tools	ROS, Jenkins, PyTorch, Scikit, React, SQL, Git, Github, Linux, Android