Pranav Doma

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EDUCATION:

New York University - MS,Computer Engineering | CGPA -3.73   08/2022 - 05/2024
Coursework-Robot Perception , Computing Systems Architecture, Real-Time Embedded Systems , Deep Learning , Digital Signal Processing , Machine Learning , Applications of AI for Predictive Maintenance (NVIDIA DLI)
S. V National Institute of Technology - B.Tech, Electrical Engineering | CGPA-7.24   07/2017 - 06/2021

SKILLS: C++ , C, Embedded C, Python, Matlab, Assembly, LLVM, SIMD (AVX2/SSE), GPGPU (CUDA), LLVM MCToll, Fixed-Point Arithmetic,Linux Kernel Modules, ACPI, RTOS, QEMU,Git, Docker, Podman, GDB, Android Studio, HPC (Slurm, Singularity), Oracle Cloud, Sensor Modeling (TOF, FMCW Radars), Performance Profiling, CrewAI, LangChain, Redis

WORK EXPERIENCE:

MultiCoreWare Inc- Software Engineer Internship (Embedded systems, Sensor Eng,) | Urbana Champaign   10/2024 - present
- Modeled empirical sensor coverage for TOF and FMCW radars, focusing on coverage footprint analysis, 2D/3D environment modeling, and interior vehicle sensor modeling.
- Building llvm-mctoll for static binary translation between ARM and X86, debugged instruction-level behavior via GDB and validated app binaries using Android Studio emulation workflows.
- Device enumeration in the ACPI namespace,Developed Linux kernel modules; debugged I2C and UART communication.

New York University- Assistant Research Scientist | New York   05/2024 - 10/2024
- Developed a language-guided motion planning framework that achieved a 27.1% reduction in computational nodes and 39.1% improvement in instruction compliance over baseline planners.
- Designed a multi-agent LLM architecture for high-dynamic vehicle maneuvers, enabling iterative refinement of control parameters through physics-based validation, improving maneuver success rates to 90% and outperforming single-agent systems by 46%.

TRC Robotics -Robotics Software Engineer & Business Development Associate | Remote   10/2023 - 10/2024
- Built and deployed Docker/Podman containers ,implemented Grafana dashboards, and managed Keycloak authorization for ROS-based systems.
- Migrated servers and optimized CI/CD pipelines, enhancing system reliability and deployment efficiency.

Delhivery - Station Manager | Hyderabad   07/2021- 03/2022
- Managed last mile supply chain operations; oversaw a team of 30+ and improved key performance metrics: FDDS, LPMA, Closure, and CSAT.
- Engaged in customer-facing meetings to troubleshoot integration issues, provide updates, and ensure the target meets client expectations and resolves performance concerns.

PROJECTS:

CUDA GPU Programming Portfolio | (CUDA, Cpp, SIMD): |Spring 2025
- Implemented a suite of CUDA applications (vector addition, matrix operations, convolution, softmax, image processing) with memory coalescing and shared memory tuning.
- Built SIMD-optimized CPU versions using AVX2/SSE instructions for direct performance comparison.
- Built custom CUDA conv2D kernels on image data sourced from OpenCV.

Hardware-Software Co-Design for RISC-V| Processor Simulation and Transformer Encoder Acceleration: | Fall-2023
- Built a 5-stage pipelined, cycle-accurate RISC-V simulator resolving RAW hazards through forwarding and stalling.
- Designed custom RISC-V instructions (fixed-point MAC, fast softmax, saturated vector ops) to accelerate Transformer workloads.
- Achieved **8.1× speedup** (29,000 → 3,680 cycles) for transformer encoder inference through hardware-software co-optimization.

Stock Price Forecasting with Sentiment Analysis (Pytorch, Neural Networks, Statistic Analysis): | Spring-2023
- Achieved a 4-5% prediction error in stock forecasting using deep learning models (Transformer, DP LSTM, CNN LSTM), Outperforming traditional ARIMA models.
- Performed sentiment analysis on 6,000 news articles and integrated insights with 15 technical indicators, boosting forecasting accuracy.
- Leveraged NYU's Greene HPC cluster with Singularity containers and Slurm for job management.

PUBLICATIONS:

- **ManeuverGPT-Agentic Control for Safe Autonomous Stunt Maneuvers** - arXiv:2503.09035v1 [cs.RO]
- **LLM-Enhanced Path Planning: Safe and Efficient Autonomous Navigation with Instructional Inputs**-arXiv
- **Explainable Autonomous Mobile Robots: Interface and Socially Aware Learning** -Late Breaking Report, IEEE-ROMAN-2024
- **A Review On Wind Farm Reliability With Hybrid Cable Connection** - Book Chapter, Energy Conversion Systems: An Overview, Nova Science Publishers. ISBN: 978-1-53619-200-1