Ritwik **Patil**

Software Engineer · ML Engineer

6441 Rolling Meadows Ct, San Jose, California

(+1) 408 644 6506 | draguve@gmail.com | draguve | draguve

Work Experience

San José State University
San José, California

Research Assistant
Feb. 2024 - Present

- Developed scalable algorithms to generate topographical meshes of Bay Area faults, achieving 500 million tetrahedrons, leveraging VTK and GMSH Python bindings.
- Utilized SeisSol with MPI parallelization, OpenMP, and CUDA to simulate seismic wave propagation on high-performance clusters like San Diego Supercomputer Center's Expanse and SJSU's Spartan.

Samsung R&D
Noida, India

Software Engineer
Jun. 2020 - Aug. 2023

- Developed and deployed 4 machine learning models for Samsung Watches, trained in Python and implemented in C/ARM Assembly, achieving inference times of 0.05ms with a memory footprint of 2-5KB per model.
- Led a team of three developers to design a flicker reduction algorithm for the Super Slow Motion feature, enhancing user experience across millions of devices.
- Increased internal ML library efficiency by 150% and reduced storage requirements by 300% through a custom Int8 quantization method.
- Mentored and trained junior researchers in machine learning, computer vision, and optimization, fostering a high-performance team.

Samsung R&D
Noida, India

Intern
Jan. 2020 - Jun. 2020

- Researched and implemented advanced flicker removal techniques, including temporal filtering, frequency-domain analysis, and machine learning, to develop efficient algorithms for video and image processing.
- Designed and maintained the Setup Wizard application for all Samsung devices in the US Region, enhancing the first-use experience for millions of users.

Education

San José State University
San José, California

Master of Science in Artificial Intelligence
Jan. 2024 - Present

Thapar Institute of Engineering and Technology
Patiala, India

Bachelor of Engineering in Electronics and Computer Engineering
Jan. 2024 - Present

Skills

Programming	**Proficient:** C, C++, GoLang, Python, Assembly (x86/ARM/MSP430), SQL **Experienced:** LaTeX, Java, JavaScript, MongoDB, C#, Kotlin **Familiar:** Rust, F#
Libraries/Frameworks	TensorFlow, PyTorch, OpenCV, OpenMP, CUDA, WPF, Ray
Tools/Platforms	Git, Perforce, Quickbuild, CMake, Nginx, Docker, Anaconda, Kicad, Ghidra, Slurm, Elasticsearch, Redis

Projects

Contributor to RetNet Implementation
Open-Source Contribution

Python, PyTorch, einops
2024

- Optimized MultiScaleRetention by rewriting its forward parallel function, enabling concurrent matrix multiplications across heads and achieving a 5x training speed-up.
- Streamlined tensor operations with einops, reducing code complexity and enhancing maintainability.

OSC Pedalboard
Personal Project

C, C++, Fusion360, KiCad
2020

- Designed and built a customizable OSC pedalboard for DAW control, tested with REAPER and the realearn plugin to enhance workflow for audio professionals.
- Developed the 3D model in Fusion 360 and the circuit using KiCad, integrating WebSerial for easy configuration.