SUDHANSHU KULKARNI

Software Developer

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I am an earnest **Software Developer** with a perfect blend of the research-oriented and application-oriented portfolio. With years of experience facilitating clean & efficient software, I'm currently exploring the realms of HPC and Quantum Computing; *with a cup of coffee, of course.*

Education

May 2024 | **MS - COMPUTER SCIENCE, San Francisco State University**
Thesis : *Exploring classical and hybrid classical-quantum approaches for scalable distributed-memory parallel FFT.*
Course Work : High Performance Computing, Quantum Computing, Data Mining, Software Engineering

April 2020 | **BE - COMPUTER ENGINEERING, International Institute of Information Technology (SPPU)**
Capstone : *Satellite data analysis system employing vanilla Neural Networks and Dynamic Time Warping algorithms.*
Course Work : Machine Learning & AI, Data Analytics, Cloud Computing, Cyber Security

Skills

Languages	Python, C/C++, Java, CUDA, TypeScript, Javascript, SQL, HTML/CSS, bash.
Frameworks	SENSEI, Qiskit, cuQuantum, Frappe, Django, Flask, SvelteJS, NodeJS, MySQL, NoSQL, Jira.
Tools	Git, Tensorflow, PyTorch, Keras, SciPy/NumPy, MPI/OpenMP, Linux, AWS, GCP, Docker/Kubernetes, nginx,

Experience

November 2022 - Present | Graduate Research Assistantship - San Francisco State University, San Francisco, CA

- Studying the feasibility of performing scalable FFT computations "in situ" on HPC platforms (CPU, GPU & Quantum) to support scientific data analysis workloads in exascale NERSC projects like WarpX.
- Collaborations with scientists at Lawrence Berkeley National Laboratory (LBNL) for active research on Perlmutter, an HPE Cray EX supercomputer, achieving at least 10x speedup in computation time compared to traditional methods.

C++ | Python | High-Performance Computing | Massively Parallel | Open Source | Scientific Computing | MPI | Cuda | GPU

May 2023 - August 2023 | SDE Intern - Amazon Web Services, Seattle, WA

- Designed and developed an enhanced monitoring agent to be deployed on thousands of live servers worldwide as a part of the AWS CloudFront CDN services' platform team.
- Prototyped a robust and lightweight service to ensure timely capturing and reporting of critical metrics, guaranteed to enhance service reliability by at least 10% after full-fledged deployment on AWS servers across the world.
- Created live dashboards to provide real-time visibility into at least 70% of all the agents running on servers, improving the team's ability to maintain reliability and diagnose potential issues.

Python | Server-side scripting | Dashboarding | Scalable Development | Clean Coding | Unit Tests | Agile

August 2020 - July 2022 | Software Engineer - ElasticRun, Pune, IN

- Core developer of in-house ERP system to manage large-scale logistics and B2B eCommerce platform and responsible for at least 20% of the entire development workload of the 'Velocity' segment of the company.
- Worked on heavy Python-based server-side development and business-focused client-side scripting for progressive web apps, in an agile software development environment.
- Contributed to creating an automated testing framework for faster bi-weekly software deployments with Kubernetes and CI/CD pipelines on GitLab, which improved reliability and rate of deployments by ≈15%.

Python | TypeScript | Frappe Framework | PWA | SvelteJS | Full stack | Git | CI/CD | Technical Documentation

March 2018 - July 2018 | IoT Specialist Intern - SCMIND LLC, Princeton, NJ

- Low-level development on IoT-enabled supply chain machinery to deliver performance monitoring, breakdown predictions, and sensor-based critical metrics on the Raspberry Pi microprocessor hardware to power the global analytics dashboard on PowerBI via a multi-level cloud-based pipeline.

Python | IoT | Supply Chain | PowerBI | Microsoft Azure | AWS Redshift | Raspberry Pi | Performance Optimized

Notable Experiences

- An integral member of the Early-Career Conference Committee and Review Board for the ISAV workshop at The Super-Computing conference (SC23), tasked with technical evaluation and assessment of submitted research papers and complimented it with a noteworthy lightning talk on Scalable FFT project research at the conference.
  Peer Reviewed Abstracts : https://arxiv.org/abs/2402.01843
- Contributor to the Open Source SENSEI Project as a new FFT analysis backed endpoint.
- Prime contributor in GIS project to perform multi-class image classification on multi-spectral & temporal satellite data using Vanilla Neural Networks & signal-matching. Technical collaborations with scientists from ISRO, NRSC & Geospatial Design Labs, India.