SUDHANSHU KULKARNI Software Developer

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An earnest **Software Developer** bringing deep research and application-oriented profile to the table. My years of experience ensure clean, efficient software, and I'm currently diving headfirst *(coffee in hand!)* into the exciting worlds of HPC and Quantum Computing.

Experience

11/2022 - 05/2024 *(1 yr, 7 mos)*
Graduate Research Assistantship - SAN FRANCISCO STATE UNIVERSITY, *San Francisco, CA*
- Formulated feasibility studies on performing scalable FFT computations "in situ" on HPC platforms leveraging CPU, GPU & Quantum hardware to support scientific analysis workloads in exascale NERSC projects like WarpX.
- Collaborated with scientists at the LBNL supercomputing facility to conduct extended research on Perlmutter & CORI, achieving a minimum of 10x speedup in computation time compared to traditional methods. Devised a novel FFT numerical library in C++ for distributed-memory massively parallel processing architecture.

05/2023 - 08/2023 *(3 mos)*
SDE Intern - AMAZON WEB SERVICES (AWS), *Seattle, WA*
- Prototyped a robust monitoring service to ensure timely capturing of critical metrics to enhance service reliability by at least 10% after full-fledged deployment on thousands of live AWS servers worldwide as a part of the AWS CloudFront CDN services' platform team.
- Curated live dashboards to provide real-time visibility into at least 70% of all the agents running on servers, empowering the team to actively maintain reliability and diagnose potential issues.

08/2020 - 07/2022 *(2 yrs)*
Software Engineer - ELASTICRUN, *Pune, IN*
- Engineered an enterprise-grade ERP platform on the Frappe framework, streamlining logistics and B2B eCommerce processes, while single-handedly contributing to 20% of the 'Velocity' segment's development workload.
- Refined ground-level operational efficiency by executing heavy Python-based server-side development, and business focused PWAs using Flutter and SvelteJS in an agile software development environment.
- Orchestrated an automated testing framework and handled bi-weekly live software deployments with the DevOps team based on Kubernetes and GitLab-based CI/CD pipelines, boosting deployment rate and reliability by ≈15%.

03/2018 - 07/2018 *(4 mos)*
IoT Specialist Intern - SCMIND LLC, *Princeton, NJ*
- Designed and implemented low-level Python solution for IoT-enabled supply chain machinery firmware on single-board microprocessors, enabling an 85% decline in unplanned downtime through real-time performance monitoring and sensor-based anomaly detection integrated via cloud pipeline feeding a global PowerBI dashboard.

</> Technical Proficiency

Languages	Python, C/C++, Java, CUDA, TypeScript, Javascript, SQL, R, HTML/CSS, bash.
Frameworks	SENSEI, Qiskit, cuQuantum, Frappe, Django, Flask, SvelteJS, React, Node.js, MySQL, NoSQL, Redis, Helm.
Tools	Git, Tensorflow, PyTorch, Keras, SciPy/NumPy, MPI/OpenMP, Linux, AWS, GCP, Azure, Docker/Kubernetes, ElasticSearch, nginx, REST, Linux, PowerBI, Jira.

Education

2024 | **MS - COMPUTER SCIENCE, San Francisco State University**
High-Performance Computing, Quantum Computing, Artificial Intelligence, Software Engineering, Advanced Algorithms

2020 | **BE - COMPUTER ENGINEERING, International Institute of Information Technology (SPPU)**
Machine Learning, Data Mining and Analytics, Cloud Computing, Databases, Data Structures

Notable Experiences and Publications

- An integral member of the Early-Career Conference Review Board for the ISAV workshop at The Super-Computing conference (SC23), tasked with a technical assessment of submitted research papers and complimented it with a noteworthy lightning talk on Scalable FFT project research. | Peer Reviewed Abstract from the conference : https://arxiv.org/abs/2402.01843
- Contributor to the Open Source SENSEI Project as a new FFT analysis backed endpoint.
- Quantified and benchmarked Quantum Encoding models as part of Master's Thesis and pioneered research on identifying challenges and computational overheads to optimize Hybrid Classical-Quantum interfacing advancing the field of practical quantum computing. Thesis | GitHub
- Successfully earned IBM Quantum Challenge 2024 Achievement for performing utility-scale quantum experiments.
- Architected a GIS project to perform analysis on multi-spectral & temporal satellite data employing Deep Learning Networks & signal-matching algorithms yielding over 80% accuracy and collaborated with scientists from ISRO, NRSC & Geospatial Design Labs.