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 am currently exploring the realms of HPC and Quantum Computing; *with a cup of coffee, of course.*

Education

2024 | **MS - COMPUTER SCIENCE, San Francisco State University**
Thesis : *Benchmarking hybrid Classical-Quantum computing interaction models & exploring the associated challenges.*
Course Work : High-Performance Computing, Quantum Computing, Data Mining, Software Engineering

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

Technical Proficiency

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

Experience

11/2022 - Present *(1 yr, 6 mos)*
Graduate Research Assistantship - San Francisco State University, San Francisco, CA
- Conducted feasibility studies on performing scalable FFT computations "in situ" on HPC platforms leveraging CPU, GPU & Quantum hardware to support scientific data analysis workloads in exascale NERSC projects like WarpX.
- Collaborated with scientists at Lawrence Berkeley National Laboratory (LBNL) to conduct research on Perlmutter (HPE Cray EX supercomputer), achieving a minimum of 10x speedup in computation time compared to traditional methods. Created a novel numerical FFT library for distributed-memory parallel architecture.

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

05/2023 - 08/2023 *(3 mos)*
SDE Intern - Amazon Web Services, Seattle, WA
- Prototyped a robust & lightweight monitoring service to ensure timely capturing and reporting of critical metrics, guaranteed 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.

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

08/2020 - 07/2022 *(2 yrs)*
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.
- Executed heavy Python-based server-side development and business-focused client-side scripting for progressive web apps in an agile software development environment.
- Developed an automated testing framework and handled bi-weekly live software deployments with Kubernetes and GitLab-based CI/CD pipelines, acquiring ≈15% improvement in deployment rate and reliability.

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

03/2018 - 07/2018 *(4 mos)*
IoT Specialist Intern - SCMIND LLC, Princeton, NJ
- Designed and implemented low-level code for IoT-enabled supply chain machinery firmware on Raspberry Pi microprocessor, 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.

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

Notable Experiences

- An integral member of the Early-Career Conference Review Board for the ISAV workshop at The Super-Computing conference (SC23), tasked with 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.
- Led GIS project to perform multi-class image classification on multi-spectral & temporal satellite data employing Deep Learning, Vanilla Neural Networks & signal-matching algorithms yeilding over 80% accuracy. Technical collaborations with scientists from Indian Space Research Organization (ISRO), NRSC & Geospatial Design Labs, India.