Sarthak Negi

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SUMMARY

I am a motivated computer science student skilled in software development, backend systems, cloud computing, distributed system, containerization, Kubernetes, monitoring, CI/CD pipelines, and test automation. As an active open-source contributor, I collaborate with global communities to drive innovation and build impactful, scalable solutions.

EDUCATION

Jaypee Institute of Information Technology
B.tech in Computer Science and Engineering

Noida, India
2022 - 2026

PROFESSIONAL EXPERIENCE

Linux Foundation Mentorship Intern
Cloud Native Computing Foundation - KubeEdge: Kubernetes Native Edge Computing Framework

Sept 2023 - Dec 2023
remote

- Developed a solution to decouple **node cooperation** (pod traffic management within node groups) from **batch management** (deployment overrides like replicas, image, and environment variables) in an **Edge Application**.
- Deploy KubeEdge v1.14.2 on **Kubernetes v1.24.0** cluster. Improved the test coverage of the project by writing **unit tests**, and **E2E tests.**
- Collaborate with maintainers and create interactive learning experiences using Killercoda for developers to deploy KubeEdge.
- Technical Skills: kubernetes, docker, CNI, Golang, kubeEdge.

Student Developer
KDE - KEcoLab: Energy Measurement Tool

Jan 2024 - April 2024
remote

- Developed dedicated **test builds** for KEcoLab in order to ensure reliability in the lab output and to **catch bugs early.**
- Integrated KEcoLab into Okular's **CI/CD** pipeline to measure energy consumption, designing automated Gitlab **workflows** with Git tag triggers and manual web interface for comprehensive energy monitoring.
- Updated **Kate test scripts** to comply with latest version (v24), addresses compatibility issues across different Linux distributions (Ubuntu and Fedora).
- Technical Skills: CI/CD, bash scripting, Gitlab, test-automation

Student Developer
Keploy - API Testing Tool

May 2024 - July 2024
remote

- Developed a TypeScript sample application with comprehensive **Jest unit tests**, achieving 95% test coverage.
- Implemented automated **CI/CD** benchmarking **workflows** using **GitHub Actions**, reducing deployment testing time by 25%.
- Enhanced Developer Experience by optimizing product features, writing comprehensive documentation, and resolving GitHub issues, leading to measurable improvements in user engagement.
- Keploy has 35.7k + downloads and 5.1k + stars on github.
- Technical Skills: typescript, jest, CI/CD, github-action

PROJECTS

DevSecops Deploy Netflix Clone   GitHub

- Designed and automated a **CI/CD pipeline** using Jenkins to deploy a **Netflix clone** on **AWS EC2**, integrating **SonarQube, Trivy** and **OWASP** Dependency-Check for **code quality** and **vulnerability scanning**.
- Containerized the application using **Docker**, managed deployments with **Kubernetes**, and utilized **Helm** to install **Prometheus** Node Exporter for **cluster monitoring**.
- Implemented **Trivy** for container vulnerability **scanning** and **Prometheus-Grafana** for real-time monitoring, **resolved** 36+ critical vulnerabilities in container images.
- Automated application **deployment** using **ArgoCD**, enabling **GitOps** practices by syncing with GitHub repository for seamless and consistent deployments in Kubernetes-based environments.

SignSpeak   GitHub

- Developed a **machine learning** powered web application using **Flask**, **OpenAI Whisper API**, and **Google MediaPipe** to translate **audio/text** into **ASL animations**, improving accessibility for deaf individuals.
- Designed and implemented a 3D animation system using **Three.js** to visualize ASL gestures, resolving challenges in overlapping hand movements and enhancing user experience.
- Integrated Google MediaPipe Hand Landmarker to **extract** hand coordinates and **mapped** them to ASL gestures using a custom ASL Coordinate Dictionary, ensuring accurate and realistic animations.
- Containerized application using **docker**, deployed on **k3s** via **Rancher**, and implemented multi-cluster CI/CD workflow. Utilized GitHub Actions for automated pipeline, integrated **Amazon ECS** and **ECR** for container **registry** and **deployment**, and established **GitOps** practices with **ArgoCD** for streamlined infrastructure management.

K8sGo

- Designed and developed a lightweight **Kubernetes CLI tool** in Go, leveraging the **client-go lib** to interact with **Kubernetes API Server** for seamless resource management and **real-time cluster monitoring**.
- Implemented **namespace switching** and **custom CLI flags**, enabling users to efficiently manage resources across namespaces and execute commands with enhanced flexibility.
- Built a **plug-and-play** sol compatible with any Kubernetes cluster, emphasizing ease of use, portability, and low resource usage.
- Enabled **real-time interaction** with Kubernetes clusters, including fetching resource details, creating/deleting resources, and monitoring live events for improved cluster management.

CognitiveWeb

- Developed an intelligent chatbot leveraging Retrieval-Augmented Generation (**RAG**) and **NLP** techniques to understand and respond to queries based on real-time web content, utilizing **Grok AI**, **LangChain**, **BeautifulSoup** for seamless information retrieval and natural language generation.
- Implemented advanced features such as **real-time** web scraping, Google Generative **AI embeddings** for text **vectorization**, semantic search with **Chroma** vector database, reduces response generation time through efficient similarity search and retrieval.
- Designed and deployed a user-friendly Streamlit graphical user interface, enhancing user interaction by providing an intuitive platform for engaging with the chatbot and facilitating seamless conversation continuation.

CERTIFICATION

AWS Cloud Practitioner Essentials

- Acquired foundational knowledge of **AWS Cloud services**, including **compute** (EC2), storage (S3, EBS), **databases** (RDS, DynamoDB), and **networking**.
- Gain proficiency in **AWS security practices** (IAM, MFA, shared responsibility model) and **monitoring tools** (CloudWatch, CloudTrail).
- Understands the AWS Global Infrastructure, cloud migration strategies, and cost optimization AWS Free Tier, consolidated billing.

Introduction to Continuous Delivery and GitOps using Argo CD

- Implemented **GitOps practices** using **Argo CD** for automated **Kubernetes deployments** and application lifecycle management.
- Deployed and managed **Helm charts** through Argo CD, ensuring auto sync and health monitoring of Kubernetes applications.
- Applied Continuous Delivery principles using pull-based deployment models and GitOps methodologies for infra management.

Securing the AI/ML Supply Chain With Chainguard

- Identified and mitigated vulnerabilities in **AI/ML supply chains**, including data, models, and infrastructure, using tools like Chainguard Images and PyTorch.
- Created and analyzed Software Bills of Materials (**SBOMs**), AI/ML Bills of Materials (**AI/MLBOMs**) to track, secure components.
- Used **Sigstore** and **Cosign** to digitally sign and verify software artifacts, containers, and attestations for secure workflows.

Certified Kubernetes Administrator (CKA)

- Acquired expertise in **Kubernetes cluster architecture**, installation, and configuration, **including** high-availability setups, version upgrades using Kubeadm, and **ETCD** backup/restore processes.
- Developed a strong understanding of **Kubernetes networking**, **including** ClusterIP, NodePort, and LoadBalancer services, as well as configuring **Ingress controllers**, **CoreDNS**, and **CNI plugins**.
- Gained proficiency in managing workloads and scheduling, including deployments, rolling updates, rollbacks, configuring applications using **ConfigMaps**, **Secrets**, and **resource limits**.
- Skilled in **troubleshooting** cluster components, application failures, and networking issues, along with configuring **persistent storage** using **StorageClasses**, **PersistentVolumes**, and **PersistentVolumeClaims**.

ACHIEVEMENTS AND LEADERSHIP EXPERIENCE

Open Source Summit Japan 2024 Speaker

- Deliver a presentation on **core components** and **architecture of KubeEdge**, highlighting its role in extending **Kubernetes** to efficiently manage **edge computing** workloads. Begin with a concise introduction to edge computing, emphasizing its increasing significance in **IoT** and **distributed systems**.

Core Team Member Of OSDC (open source developer community)

- Mentored 30 students in an open-source development workshop, guiding them to successfully make their first contributions to open-source projects within 30 days.
- Organized bi-weekly meetups on trending industry topics, fostering knowledge-sharing and skill development among participants.
- Organized two hackathons (OSDC-Hack and CodeJam), fostering collaboration and innovation.

Technical Skills

- golang | java | C++ | python | js | html | css
- node.js | express.js | react.js | php | SQL | mongoDB | langchain | scikit-learn
- Linux | Windows | AWS | Git | docker | Kubernetes | Jenkins | prometheus | grafana | Ansible | Terraform