CHIRAG MODI

M.Tech Computer Science and Engineering, IIT Gandhinagar

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Education

IIT Gandhinagar	**Gandhinagar, Gujarat**
Master Of Technology in Computer Science and Engineering	*CGPA:9.36/10.0, July. 2023 –Jun 2025*

The Maharaja Sayajirao University Of Baroda	**Vadodara, Gujarat**
Bachelor Of Engineering in Computer Science and Engineering	*CGPA: 3.92/4.0, July. 2017 – July 2021*

Work Experience

Turing **June 2025 − Present**

Data Scientist - Full time | Pythom, Agentic workflow, RLHF, Prompt Engineering, SFT *Remote*

- Designed agentic workflows using Plan-and-Execute and ReACT frameworks to fine-tune frontier LLMs for enterprise automation.
- Generated multi-turn training data for ServiceNow scenarios, integrating tools with reasoning and context awareness.

Kapidhwaj AI **May 2024 − Sep 2024**

Network Engineer - Intern | Streming,Google Cloud, WebRTC,FFmpeg *Research Park IIT GN, Gujarat*

- Collaborated with a team at a **startup** founded by an alumnus of **IIT Hyderabad**.
- Developed a **scalable, low-latency** streaming solution in the cloud for processing local IP camera feeds.
- Developed a **WebRTC** pipeline to deliver IP camera feeds from the cloud to the end users.
- Developed **Nodejs** application for local **RasberryPI**, which manages the cameras connected inside the same network.

WiseDV India **July 2021 − July 2023**

Software Engineer - Full time | MEAN Stack, WebRTC,AWS,Electron *Vadodara, Gujarat*

- Collaborated with a team at **WiseDV(startup company)** to develop a **video conferencing application, Bozu**
- Developed features for PC application, including **closed captions, meeting recordings, and desktop notifications** with **Electron Framework.**
- Optimized and decoupled monolith server into microservices and developed AWS autoscaling policy to scale individually.
- Deployed scaled servers of bozu by leveraging AWS services, including **EC2,CloudWatch, VPC, Autoscaling Group, RDS, Route 53, ELB and NLB.**
- Developed a real-time logging system for bozu using **MEAN stack.**

Research Experience

DPDK-Based High-Performance DNS Resolver **Dec'24 - Present**

Advisor:- Prof. Sameer G. Kulkarni | DPDK, KDNS, AF_XDP and Multus CNI Plugins, Kubernetes

- Deployed and configured **KDNS**, a high-speed DNS resolver leveraging **DPDK** for kernel-bypass packet processing.
- Contributed to core development by upgrading KDNS to a newer DPDK release, adapting to API changes and resolving compatibility issues.
- Currently developing a **KDNS** for container environments using AF_XDP and DPDK with Multus CNI plugins.

Comparative Study of User-Space TCP/IP Stacks with DPDK **Oct'24**

Advisor:- Prof. Sameer G. Kulkarni | DPDK, mTCP, F-stack, h2load, NGINX

- Evaluated user-space TCP/IP stacks (**mTCP, F-Stack, and DPDK-KNI**) under **short and long flow** workloads with simulating real-world web traffic.
- Built an **NGINX web server** on top of user-space network stacks (mTCP and F-Stack), utilizing **DPDK** with kernel bypass to achieve substantial performance gains.

High-Performance Packet I/O Evaluation on Bare-Metal Systems **June'24**

Advisor:- Prof. Sameer G. Kulkarni | DPDK, io_uring, pktgen

- Conducted an empirical performance analysis of modern packet I/O frameworks—**DPDK, io_uring**, and the native Linux networking stack—on a 10 Gbps testbed using synthetic traffic workloads.

Projects

eBPF-Based Code Profiling in Kubernetes Deployments | *Perforator, Kubernetes, eBPF* | Code ⦿   **April 2025**

- Integrated **Perforator**, an **eBPF-based** performance profiler, into a **Kubernetes** environment to monitor both system-level and container-level application behavior with minimal overhead.
- Analyzed and visualized profiling data for CPU-bound and network-intensive applications to uncover runtime bottlenecks and optimize resource usage across Kubernetes workloads.

5G Stand Alone Network Slicing Simulation | *Open5Gs,UERANSIM* | Code ⦿   **November 2024**

- Deployed 5G RAN and core architecture using **Open5GS** and **UERANSIM** for end-to-end 5G simulation.
- Simulated network slicing for **eMBB, URLLC, and mMTC** by replicating control and user plane network functions.

Instant Payment Gateway | *Distributed Systems,Go lang,GRPC,ELK Stack,Mysql,Nginx,Docker* | Code ⦿   **April 2024**

- Designed and implemented a high-performance, fault-tolerant payment gateway mimicking **UPI functionality**, capable of handling **thousands of concurrent requests.**
- Implemented a **load-balancing** strategy using **Nginx** and containerized all servers and **microservices (Nginx, MySQL, Elasticsearch)** using **Docker** for streamlined deployment and management.

VOIP Call Application | *Angular, ELK Stack, WebRTC, Ejabberd XMPP* | Code ⦿   **May 2023**

- Designed and implemented a peer-to-peer video call application utilizing **WebRTC and XMPP** signaling server.
- Integrated **Elasticsearch** to enable optimized searching of usernames from large user databases.

Research Publications

- C. Modi and S. G. Kulkarni, *"Kernel Bypass and User-space Network Frameworks for High-Performance Computing Workloads,"* *2024 IEEE 31st International Conference on High Performance Computing, Data and Analytics Workshop (HiPCW)*, Bangalore, India, 2024, pp. 187–188.
  DOI: 10.1109/HiPCW63042.2024.00071

- C. S. Modi and S. G. Kulkarni, *"Fast Packet Processing: A Survey of Techniques for Bare-Metal and Virtualized VM and Container Environments,"* (under review).

Technical Skills

Languages: C, Python, Java, JavaScript, Go Lang
Developer Tools: AWS, GCP, Git and GitHub , Docker, Kubernets, Wireshark
Technologies/Frameworks: MEAN Stack, WebRTC, Electron, OpenMP, MPI, DPDK, Pytorch, Numpy, Pandas
Databases:MySql, MongoDB, Elastic Search
Course-work:Parallel and distributed systems, Advanced Computer Network, Machine Learning, NLP, Network and Security, 5G & Beyond, Data Structures & Algorithms

Achievements and Extra Curricular Activities

- Appointed as Sanchar Mitra by DoT to promote citizen-centric telecom services.
- Cleared written tests for **ISRO** and **BARC** and was shortlisted for interviews for scientist roles.
- Having a **6-star badge** in problem-solving on the **hackerrank**   and solved more than **750** problems on **leetcode**
- Secured **AIR 543** in Gate 2023 among **80k candidates.**
- Secured 99.89 percentile in **GUJCET**, the state-level engineering entrance examination for undergraduate admissions.
- Hobbies include Reading, Music, Gardening