Vaibhav Sharan

602-566-1136 vaibharn@gmail.com linkedin.com/vaibharn github.com/vaibharn

Education

Arizona State University May 2025
Master of Science in Computer Science — GPA: 3.89 *Tempe, Arizona*
- **Graduate Teaching Assistant:** CSE 534: Advanced Computer Networks

Netaji Subhas Institute of Technology 2017 - 2021
Bachelor of Engineering in Computer Engineering *New Delhi, India*

Experience

Centre for Development of Telematics Sept 2021 – July 2023
Research Engineer *New Delhi, India*
- Initiated and led the R&D for a multi-threaded HLR application (in **C and SS7 Protocol**) architecture featuring a message queue, conducted load testing, and leveraged **Docker** scaling to improve performance by over 20x for 5 million subscribers in 2G/3G.
- Developed and documented UDM, AUSF, and UDR Network Functions prototypes (in **C++**) for the BSNL 5G project leveraging Open5GS and implementing 9+ interface messages following 3GPP specifications and scaled them with **Kubernetes**.
- Built and maintained **C APIs from eXtremeDB** for 4G node HSS and 3G node HLR for BSNL and TCS in the Indigenous 4G Project, backed by the Government of India which has been deployed in over 400 regions in India.
- Achieved National Centre for Communication Security certification for HSS by sanitation of memory leaks and modification of insecure code of over 100k LOC to fulfill security assurance requirements for relevant national and international standards.
- Researched, developed, and documented software requirements for DevOps tools, applications, product prototypes, and systems for telecom solutions paving way for commercial deployment.

NatureDots Jan 2020 – Aug 2020
Innovative Systems Engineer *New Delhi, India*
- Designed, developed, and deployed a predictive information system on AWS to build sustainable efficient fisheries, enhancing ecological and water resource quality powered by machine learning models for data analysis.
- Created backend **Django**, database **MongoDB**, and a management dashboard. Set up REST APIs on ThingsSpeak and UbiDots for IoT sensors.
- Performed a key role in designing the architecture of project, and contributed to presentations for Innovation and Start-Up Funding events obtaining over $100,000 in grants.

Bharat Electronics Limited May 2019 – July 2019
Summer Intern *Ghaziabad, India*
- R&D of a Remote Desktop Sharing and Access application to be deployed on Indian Naval ships. **Python & UNIX**
- Developed a Real-time Radar Information Visualization and Analysis software. **Seaborn, Bokeh**
- Created and tested prototypes for the Software Development team for Radar Data Collection in Indian Navy ships.

Projects

Round-Trip Time Measurement in FABRIC *Master's Research Project* Sept 2023 - Nov 2023
- Researched and analyzed RTT within the FABRIC testbed to evaluate network performance and user experience.
- Implemented and compared various RTT measurement methods, including One-way Latency with Precision Time Protocol, P4-based data plane monitoring, and TCP traffic analysis using Scapy.
- Designed and executed experiments on the FABRIC testbed, utilizing its high-speed optical connections and distributed infrastructure with help of multi-threaded scripts.

Modelling Illustrations using Generative Adversarial Nets *Bachelor's Capstone Project* Jan 2021 - July 2021
- Designed and implemented a Deep Convolutional GAN architecture for generating anime character faces. Customized the SRResNet generator architecture by integrating 16 ResBlocks and sub-pixel CNNs, and designed a 10 ResBlock discriminator.
- Built a dataset of approximately 143,000 anime faces by web-scraping with gallery-dl and employed python-animeface for face detection and preprocessing.

Comparative Analysis of Diffusion Models for Image Generation Sept 2024 - Nov 2024
- Conducted a comprehensive evaluation of state-of-the-art diffusion models for text-to-image generation, utilizing metrics such as Inception Score (IS), Fréchet Inception Distance (FID), CLIP Score, and Text-to-Image Faithfulness (TIFA).
- Developed an efficient image generation pipeline using ComfyUI, generating over 300 images across models while overcoming computational constraints through quantization techniques to optimize model performance on limited hardware.

Technical Skills

Languages: C, C++, Python, Java, Golang
Computer Networks: 5G/4G/3G/2G Core, TCP/IP Stack, SS7 Protocol, Socket Programming, Protobuf
AI/ML: Diffusion Models, CNNs, GANs, Matplotlib, Seaborn, Bokeh, TensorFlow, PyTorch
Databases: MongoDB, Firebase, Redis, Hazelcast, eXtremeDB
Tools & Technologies: Dockers, Kubernetes, gRPC, gem5, Valgrind, GDB, Git, AWS, Jira