

SHEFALI TUSHAR KULKARNI

USC/Information Sciences Institute Suite 1001 4676 Admiralty Way Marina Del Rey, Los Angeles, CA-90292 | (323) 620-4041 | shefalit@usc.edu | <https://linkedin.com/in/shefali-tushar-kulkarni>

EDUCATION

University of Southern California

CS, PhD

Los Angeles - CS, PhD

August 2023-May 2028

- Focus: Large Scale Network Analysis, Topologies, Routing protocols, Network Management, Mobile
- Advised by Dr. John Heidemann (Analysis of Network Traffic Lab)
- Coursework: Advanced Algorithms, Advanced Computer Network, Deep Learning and its Applications, Internet Measurement

The National Institute of Engineering

CS, MTech

Mysuru

January 2018-December 2020

- Awarded the **Valedictorian Gold Medal** for securing the highest rank in the master's program.
- Coursework: Distributed Systems, Cloud Computing, Network Security.
- Thesis Title: Design and Implementation of a Debugging Tool for an Enterprise Storage. Thesis Supervisor Prof. Prajakta M

Visvesvaraya Technological University

EE, BTech

Mysuru

January 2014-December 2018

- First Class with Distinction
- Thesis Title: Project Augmentation for Negating Enemy Projectile. Thesis Supervisor: Dr. D J Ravi

SKILLS

Languages: Python, Shell, C++, C

Skills: Linux, Data Science, Network Architecture; Parallel Computing : Hadoop, Map-Reduce; Large-Scale Network System Design; Network Topologies; Routing protocols : TCP/IP, UDP, DNS, DHCP, ARP, HTTP, OSPF, BGP, DNS, VLAN, NTP, NAT, TCP with IPSec, OpenFlow; Network Management, High Available Enterprise Network, Cloud computing, Content Delivery Networks (CDN), Linux-based Virtual Machines (VMs), Software Defined Networking, Bayesian inference
Automation and DevOps: Jenkins, Kubernetes, Matlab CI/CD, GitHub Actions, Dockers and Containers, Wireshark, Grafana, Splunk, Prometheus

Collaboration: Jira, Confluence, Slack, Git, Agile/Scrum methodologies, GCC

WORK EXPERIENCE

Dell Technologies (Dell EMC)

Bengaluru, India

Software Engineer 2, Infrastructure Solution Group

August 2020-July 2023

- Optimized Dell PowerMax NVMe Storage Systems with Python features, enhancing VMs, Docker networking, and TCP/IP security, while ensuring high availability, fault tolerance, and improved performance
- Collaborated in cross-functional teams, participating in hackathons and working with sustaining teams to address customer issues promptly and ensuring implementation of solutions with a customer-first approach
- Conducted a thorough unit and integrated test, ensuring robust code quality and optimal performance of storage server features
- Applied for 3 US patents in field of virtualization frameworks

Dell Technologies (Dell EMC)

Bengaluru, India

Software Engineer Intern, Infrastructure Solution Group

August 2019-August 2020

- Built an app to automate triage of a faulty storage enterprise device - Dell EMC Powermax series, improving incident resolution efficiency for 200+ enterprise clients
- Enhanced storage automation workflows, reducing manual configuration time by 60% and ensuring seamless deployment for enterprise clients
- Designed and tested of Linux based product release using Python and Shell

PATENTS

- Shefali Kulkarni, Vimal Krishna, Amit Kumar Karira. Method to collect diagnostics from failed docker containers. Submitted on 15.06.2022. Patent id: 81942741 for Dell Technologies
- Viveka Narendra, Shefali Kulkarni. Dial home and template-based auto recovery of GuestOS system. Submitted on 16.06.2022. Patent id: 81942746 for Dell Technologies

- Shefali Kulkarni, Mahesh Thotadhar, Viveka Narendra. A user interactive interface for rm' (remove) command in command line interface of Pmax GuestOS. Submitted on 04.08.2022 for Dell Technologies. Patent application was filed but did not proceed to approval

PUBLICATIONS

- Evaluating Interconnection of Mobile Networks to the Internet - Submitted to IEEE Infocomm 2025
- Design and Implementation of a Failure Point Debugging Tool for Effective RCA of an Enterprise Storage. IJRESM Volume-3, Issue-5, May-2020
- Project Augmentation for Negating Enemy Projectile, International Journal of Engineering Research & Technology (IJERT) NCESC - 2018 (Volume 6 - Issue 13)

PROJECTS

DARPA (SABBRES) - Information Science Institute, USC **Graduate Research Assistant**

Los Angeles, CA
August 2023-Present

- Developed a Deep Learning solution to optimize energy use of DNS root servers, using ML-powered SDNs for dynamic energy management and savings upto 30%
- Developing an algorithm to detect large-scale, persistent inter-domain congestion, revealing 4% of internet is affected, with a few links congested over 90% of time
- Analyzed gateway efficiency for AT&T, T-Mobile, and Verizon, identifying latency increases of up to 66% and proposing theoretically optimal gateway placements using machine learning to improve performance
- Optimized network resilience and topologies using Python, Hadoop, Traceroute, Scamper, K-Means clustering and USC-based tools to enhance routing protocols and enhancing network performance

Juniper - Dell Technologies **Intern/Software Engineer**

Bengaluru, India
August 2020-July 2023

- Designed and developed Docker-based Guest OS and micro-services for Dell PowerMax NVMe storage systems in Linux, providing High Availability with VMware vStorage APIs for Storage Awareness, Cloud, and File Systems
- Leveraged Python and Shell to automate processes and streamline workflows, increasing system efficiency

Triagex - Dell Technologies **Student**

Bengaluru, India
August 2019-July 2020

- Engineered an automated log based analysis and triage tool for Dell EMC's Powermax Guest OS, reducing troubleshooting time by 60% and minimizing customer downtime by eliminating manual intervention
- Utilized Python, Linux, Docker, and Containers to create and deploy scalable solutions, optimizing performance and streamlining workflows

PRAXEP - Visvesvaraya Technological University **Student**

Mysuru, India
June 2017-May 2018

- Developed hardware and software for a smart anti-missile system, achieving 95% success in outmaneuvering incoming projectiles
- Leveraged Python and Arduino UNO ATmega328 to design and implement interactive hardware projects, enhancing automation and functionality

AWARDS

- **Valedictorian Gold Medal** – Awarded for securing the first rank in the Master's program, recognizing academic excellence and outstanding performance.
- **Best Poster Presentation Award, USC** – Recognized for effectively presenting research work, demonstrating strong communication and technical expertise.
- **"Winning Together" Dell Inspire Award** – Awarded for successful collaboration and teamwork in completing a major product release.
- **"Innovation" Dell Inspire Award** – Recognized for filing patents that contributed to technological advancements and problem-solving.