Sumeet Shirgure

SOFTWARE ENGINEER | COMPUTER SCIENTIST

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"Simplicity is the ultimate sophistication."

Education

University of Southern California   *Los Angeles, CA*
M.Sc. (Hons.) in Computer Science   *Aug 2021 - May 2023*
- Graduated with a GPA of 3.9/4.0
- Accepted into the CS MS honors program.
- Initiated into the Phi Kappa Phi honor society.
- Awarded the graduate research assistant fellowship.

Indian Institute of Technology, Kharagpur   *West Bengal, India*
B.Tech (Hons.) + M.Tech in Computer Science and Engineering   *July 2015 - May 2020*
- Graduated with honors and a cumulative GPA of 9.06/10.00

Work Experience

Ming Hsieh Department of Electrical and Computer Engineering, USC   *Los Angeles, CA*
Research assistant   *May 2022 - April 2023*
- **Job description:** Research assistant at the System Power and Optimization and Regulation Technology (SPORT) lab
- **Project description:** Part of the ColdFlux project **[Link]** under the SuperTools **[Link]** initiative, aimed at developing design automation tools for superconductor electronics.
- **Responsibilities:** ownership of code developed at the lab and making software deliverables for the institutions involved. I also took the initiative to improve code quality, and to optimize the performance of some of the tools by factors of magnitude.
- **Skills:** Software engineering, docker, C, C++, python, graph algorithms.

Google   *Bengaluru, India (working remotely)*
Software Engineer   *August 2020 - June 2021*
- **Job description:** SWE in the call ads infrastructure team.
- **Work description:** Programmed a cache to save time on API calls to a text-to-speech deep neural network model.
  Used Google's BigTable for caching, and the result was an improvement in latency by at least 30%.
  Other than that, I aided in the prototyping of a new product that worked in conjunction with call ads and Google Maps.
- **Skills:** C++, scripting, software version control, parts of Google's technologies, remote communication, general problem solving

Department of Computer Science and Engg., IIT Kharagpur   *West Bengal, India*
Teaching assistant   *Academic year 2019-2020*
- Assisted the instructor of a graduate level course on advanced graph theory. Responsiblities included conducting tutorial sessions and evaluating assignments.
- Did so for an undergraduate lab on operating systems as well. I was responsible for evaluating programming assignments

D.E Shaw   *Hyderabad, India*
Software Engineering intern   *May 2019 - July 2019*
- **Project description:** Improving the automated ranking quality of DesFlow – a ticket resolution and workflow management system.
- **Responsibilities:** Experimented with various online machine learning models for ranking feeds. Took the initiative to also qualitatively evaluate their relative performance on production data by surveying users.
- **Skills:** Java, scripting, machine learning, statistics, data processing
- Based on my work and presentation, I was offered a full time position.

Adobe   *Noida, India*
Deep learning research intern   *May 2018 - July 2018*
- **Project description:** research the problem of natural language paraphrase generation using deep neural models, with an intent to create robust chat bots. Surveyed existing literature and devised improvements over a baseline model.
- **Responsibilities:** Experimented with new methodologies for natural text generation involving alternative forms of language modelling and feature augmentation using dependency parse based syntactic information.
- **Skills:** python, tensorflow, pytorch, deep learning
- Based on my work and presentation, I was offered to intern again the next summer.

Coursework and projects

Algorithms and discrete math	Participated in **ICPC**, **CodeJam**, **HackerCup** and the like.
Distributed systems	Co-wrote a remote file system with replication using gRPC and FUSE. **[Link]**
Computer networks	Wrote a protocol library on top of UDP for reliable transmission. **[Link]**
Compilers	Built a compiler for a custom language performing matrix operations. **[Link]**
Computer architecture	Wrote Verilog specification a CPU with a stack-based instruction set. **[Link]**
GPU & parallel programming	Co-designed a CUDA interface for convolutional neural networks. **[Link]**

Skills

Programming	C, C++, Java, python, SQL, Verilog
Libraries and frameworks	tensorflow, pytorch, qiskit, Apache Spark, CUDA
Tools	Linux (Arch Linux enthusiast), Shell (Bash/Zsh), version control systems like Git
Soft Skills	Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements, Honors and Awards

2015	**Ranked 415th among 1.5 million applicants** , IIT Joint Entrance Exam (Advanced)	*India*
2019	**Top 8 teams from the Indian subcontinent**, International Collegiate Programming Contest **[Link]**	*Porto, Portugal*
2019	**Top 1000 participants worldwide**, Google's CodeJam **[Link]**	*Online*
2019	**Top 500 participants worldwide**, Meta's HackerCup **[Link]**	*Online*
2020	**Scored 325/340**, GRE, Verbal: 157/170, Quantitative: 168/170, 4.0/6.0 Analytical writing	*India*
2021	**Dean's Master's scholarship**, $5000 fee waiver	*USC*
2022	**Quantum computing hackathon winner** , QCHack **[Link]**	*Online*
2022	**Accepted into the CS MS honors program**, **[Link]**	*USC*
2022	**Graduate RA award**, Full tuition fee waiver and stipend	*USC*
2023	**Initiated into Phi Kappa Phi**, Top 10% of graduate students	*USC*
2023	**MIT iQuHACK participant**, Invited to the in-person quantum computing hackathon. **[Link]**	*MIT*

Writings

UNPUBLISHED MANUSCRIPTS

A gentle introduction to quantum algorithms for combinatorial and optimization problems
Sumeet Shirgure
(2022). 2022

Scalable decoders for quantum surface codes
Sumeet Shirgure
(2022). 2022

Solving the subset sum problem on a quantum computer
Sumeet Shirgure
(2022). 2022

The hidden subgroup problem
Sumeet Shirgure
(2021). 2021

PUBLISHED SOFTWARE

github.com/sumeetshirgure/DynamicPlanarHull: Release version 1.0.0 Sumeet Shirgure
2023

POSTERS

A flaw in the NeurIPS unlearning challenge and an algorithmic framework for entropy regularization.
Sumeet Shirgure
NeurIPS "New in ML" workshop (2023). 2023