

Swapnil Gandhi

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RESEARCH INTERESTS

I am interested in the system-side problems associated with training, deploying, and operationalizing deep learning models at scale.

EDUCATION

Ph.D. Candidate in Computer Science, Stanford University, GPA: 4.09/4.0 Jul 2022 – Present

- Advisor: Prof. Christos Kozyrakis
- Current Research Focus: Efficient fault recovery support for large scale model training

M.Tech. (Research), Indian Institute of Science (IISc), GPA: 9.2/10.0 Aug 2017 – Jan 2020

- Advisor: Prof. Yogesh Simmhan
- Best M.Tech. (Research) Thesis (Honorable Mention) for “Distributed Programming Abstraction for Scalable Processing of Temporal Graphs”

B.Tech. in Computer Engineering, Bharati Vidyapeeth Pune Jul 2010 – Jun 2014

- Department Honors and Gold Medalist
- Thesis Title: Mutation Testing Tool for C Programs

PUBLICATIONS

[Papers & Posters available [here](#).]

PEER-REVIEWED CONFERENCES

- [6] Swapnil Gandhi, Christos Kozyrakis, “MoEtion: Efficient and Reliable Checkpointing for Mixture-of-Experts Models at Scale”, *Under Review*
- [5] Athinagoras Skiadopoulos, Mark Zhao, Swapnil Gandhi, Thomas Norrie, Shrijeet Mukherjee, Christos Kozyrakis, “Accelerating Mixture-of-Experts Training with Adaptive Expert Replication”, *Under Review*
- [4] Swapnil Gandhi, Mark Zhao, Athinagoras Skiadopoulos, Christos Kozyrakis “ReCycle: Pipeline Adaptation for the Resilient Distributed Training of Large DNNs”, *In proceedings of the 30th ACM SIGOPS Symposium on Operating Systems Principles (SOSP 2024)*, Nov 2024.
Selected as SRC JUMP 2.0 Best Paper for Quarter 3 2024.
- [3] Anand Iyer, Mingyu Guan, Yinwei Dai, Rui Pan, Swapnil Gandhi, Ravi Netravali “Improving DNN Inference Throughput Using Practical, Per-Input Compute Adaptation”, *In proceedings of the 30th ACM SIGOPS Symposium on Operating Systems Principles (SOSP 2024)*, Nov 2024.
- [2] Swapnil Gandhi, Anand Padmanabha Iyer, “P³: Distributed Deep Graph Learning at Scale”, *In proceedings of the 15th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2021)*, Jul 2021.
- [1] Swapnil Gandhi, Yogesh Simmhan, “An Interval-centric Model for Distributed Computing over Temporal Graphs”, *In proceedings of the 36th IEEE International Conference on Data Engineering (ICDE 2020)*, Dallas, Texas, April 2020.

PEER-REVIEWED POSTERS

- [2] Swapnil Gandhi, “Wave: A Substrate for Distributed Incremental Graph Processing on Commodity Clusters”, *2nd ACM Student Research Competition (SRC) at 27th Symposium on Operating Systems Principles (SRC- SOSP 2019)*, Ontario, Canada, Oct 2019.
Received Bronze Medal, Student Research Competition (Graduate Category)
- [1] Swapnil Gandhi, Sayandip Sarkar, Abhilash Sharma, Yogesh Simmhan, “Distributed Querying over Compressed Property Graphs”, *Student Research Symposium at 24th IEEE International Conference on High Performance Computing, Data and Analytics (HiPC 2017)*, Jaipur, India, Dec 2017.
Received Best Student Research Symposium Poster

AWARDS & HONORS

Selected for the 2025 ML and Systems Rising Stars Cohort	Apr 2025
Joint University Microelectronics Program (JUMP) 2.0 Best Paper For “ReCycle: Pipeline Adaptation for the Resilient Distributed Training of Large DNNs” in Quarter 3 2024.	Nov 2024
Stanford Computer Science Student Service Award 2024	Jun 2024
Stanford Computer Science Student Service Award 2023	Jun 2023
NetApp Gold Medal for Best M.Tech (Research) Thesis (Honorable Mention), IISc For “Distributed Programming Abstraction for Scalable Processing of Temporal Graphs”.	Jan 2022
Selected to participate in The Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS) 2020, Saarbrücken, Germany	Aug 2020
Bronze Medal, 2 nd ACM Student Research Competition (Graduate Category), at SOSP For “Wave: A Substrate for Distributed Incremental Graph Processing on Commodity Clusters”.	Oct 2019
Won 12 th IEEE International TCSC Scalable Computing (SCALE) Challenge For “Dynamic Scaling of Video Analytics for Wide-area Tracking in Urban Spaces”.	May 2019
Best Poster Award, 10 th EECS Research Students Symposium, IISc Bangalore For “Distributed Processing Model For Temporal Graphs”.	Apr 2019
Invited to attend 3 rd RIKEN R-CCS HPC Youth Workshop, Kobe, Japan	Feb 2019
Best Student Research Symposium Poster, IEEE HiPC, Jaipur, India For “Distributed Querying over Compressed Property Graphs”.	Dec 2017
Department Honors, Bharati Vidyapeeth, Pune For outstanding academic performance (Batch 2010 – 2014).	Jun 2014
TCS Popular Student Project, Bharati Vidyapeeth, Pune For “Mutation Testing Tool for C Programs”, Bachelors dissertation.	May 2014
Best Undergraduate Project Award, TRDDC Annual Students Day, Pune For “Mutation Testing Tool for C Programs”, Bachelors dissertation.	Apr 2014

INDUSTRY EXPERIENCE

NVIDIA , Research Intern	Jan 2025 – Present
Microsoft Research India , Research Fellow Internship Mentor: Anand Iyer <i>Researched techniques for improving system-wide inference goodput for early-exit deep neural network using heterogeneous resources; led to a paper in SOSP 2024</i>	Jul 2021 – Sep 2022
Microsoft Azure R&D India , Software Engineer II <i>Worked on query optimization and distributed execution strategies in SQL Server</i>	Mar 2021 – Jun 2021
Microsoft Research India , Research Intern Internship Mentor: Anand Iyer <i>Researched how model and data parallelism can be combined with independent graph partitioning for training Graph Neural Networks (GNNs) at scale; led to paper in OSDI 2021</i>	Sep 2020 – Mar 2021
Microsoft Research India , Research Intern Internship Mentors: Karthik Ramachandra, Bhargav Gulavani <i>Investigated and implemented query optimizer modifications to overcome performance regressions in scalar UDF inlined queries; shipped in SQL Server.</i>	Mar 2020 – Aug 2020
PubMatic India , Data Ops Engineer <i>Worked on reporting and ad-hoc data processing pipelines using combination of Hadoop, Hive, and Pig.</i>	Jun 2014 – Jul 2016
TATA Research Development and Design Centre India , Research Intern Internship Mentors: Prasad Bokil, Ulka Shrotri, R. Venkatesh <i>Created prototype mutation testing tool for C programs; used by internal QA teams.</i>	Sep 2013 – Apr 2014

SERVICE	Co-Chair, Stanford CS PhD Admit Weekend	2023 – Present
	Co-Organizer, Stanford CS Application Assistance Program (SASP)	2023 – Present
	Artifact Evaluation Committee (AEC) Member, ACM EuroSys 2023	Aug 2022 – Oct 2022
	Shadow PC Committee Member, ACM EuroSys 2022	Oct 2021 – Dec 2021
	Shadow PC Extended Review Committee Member, ACM EuroSys 2021	Oct 2020 – Dec 2020
	Artifact Evaluation Committee (AEC) Member, USENIX OSDI 2020	Aug 2020
	Artifact Evaluation Committee (AEC) Member, ACM ASPLOS 2020	Dec 2019
	Artifact Evaluation Committee (AEC) Member, ACM SOSP 2019	Aug 2019
	Treasurer and General Secretary for IISc ACM Student Chapter	Apr 2019 – Mar 2020
TEACHING ASSISTANTSHIPS	CS 349D: Cloud Computing Technology, Stanford	Apr 2024
	Graduate Teaching Assistant for CS 349D. Handled class discussion, homework assignments and helped with class projects (≈ 30 students).	
	DS 256: Scalable Systems for Data Science, IISc	Jan 2019
	Graduate Teaching Assistant for DS 256. Handled weekly discussion sections, homework assignments and helped with class projects (≈ 25 students).	
	E0 261: Database Management Systems, IISc	Oct 2018
	Covered papers on Google’s Spanner and Apache Giraph. (≈ 40 students).	

[CV compiled on 2025-05-14]