

Spandan Senapati

CS PH.D. STUDENT, UNIVERSITY OF SOUTHERN CALIFORNIA

Los Angeles, California, USA

✉ ssenapat@usc.edu | 🏠 fellow4.github.io | 🎓 Spandan Senapati

Education

University of Southern California

Los Angeles, California

PH.D. IN COMPUTER SCIENCE, ADVISED BY PROF. HAIPENG LUO AND PROF. VATSAL SHARAN

Aug 2023 - Present

- Research Interests: Statistical Learning Theory, Online Learning, Trustworthy Machine Learning, Generative Modeling

Indian Institute of Technology Kanpur

Kanpur, Uttar Pradesh

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

July 2018 - May 2022

- Cumulative Performance Index (CPI): **9.1/10.0** (graduated with **Distinction**)
- Awarded **Proficiency Medal** at the 55th Convocation for the best undergraduate project done by a graduating student in the CSE department
- **Academic Excellence Award** (2018-19, 2019-20): Awarded for excellent academic performance in an academic year

Experience

Indian Institute of Technology Kanpur

SPiN Lab, IIT Kanpur

GRADUATE RESEARCH ASSISTANT, ADVISOR: PROF. KETAN RAJAWAT

Aug 2022 - May 2023

- Project on Sharpened Lazy Incremental Quasi-Newton (SLIQN) method, the first algorithm with an $\mathcal{O}(d^2)$ per-iteration complexity and an explicit non-asymptotic superlinear convergence rate
- Paper accepted to AISTATS 2024 (Valencia, Spain)

Tata Institute of Fundamental Research

Remote

INTERNSHIP, ADVISOR: PROF. RAHUL VAZE

Aug 2022 - May 2023

- Project on Online Convex Optimization with Switching Cost and Delayed Gradients. Proposed an algorithm and a novel analysis technique to bound its competitive ratio for the OCO-S problem with delayed gradients. Derived nearly matching lower bounds for the problem
- Paper accepted to IFIP Performance 2023 (Chicago, USA)

Related Search Team - Microsoft Bing

Microsoft IDC, Hyderabad

DATA SCIENTIST INTERN, RS STCI TEAM

May 2021 - July 2021

- Project on Topics in Organised Map of Suggestions (TOMS). Developed an efficient clustering algorithm and built an interface which automated the clustering process and allowed doing several large-scale experiments seamlessly
- Offered a Pre-Placement offer (PPO) for a full-time data scientist position

Publications and Preprints

Efficient Swap Multicalibration of Elicitable Properties

LUNJIA HU ^{$\alpha-\beta$} , HAIPENG LUO ^{$\alpha-\beta$} , SPANDAN SENAPATI ^{$\alpha-\beta$} , VATSAL SHARAN ^{$\alpha-\beta$}

Nov 2025

Under submission

Improved Bounds for Swap Multicalibration and Swap Omniprediction

[Arxiv]

HAIPENG LUO ^{$\alpha-\beta$} , SPANDAN SENAPATI ^{$\alpha-\beta$} , VATSAL SHARAN ^{$\alpha-\beta$}

May 2025

Annual Conference on Neural Information Processing Systems (NeurIPS), 2025 (**Spotlight presentation**)

Simultaneous Swap Regret Minimization via KL-Calibration

[Arxiv]

HAIPENG LUO ^{$\alpha-\beta$} , SPANDAN SENAPATI ^{$\alpha-\beta$} , VATSAL SHARAN ^{$\alpha-\beta$}

Feb 2025

Annual Conference on Neural Information Processing Systems (NeurIPS), 2025 (**Spotlight presentation**)

Optimal Multiclass U-Calibration Error and Beyond

[Arxiv][Openreview]

HAIPENG LUO ^{$\alpha-\beta$} , SPANDAN SENAPATI ^{$\alpha-\beta$} , VATSAL SHARAN ^{$\alpha-\beta$}

Sep 2024

Annual Conference on Neural Information Processing Systems (NeurIPS), 2024

Sharpened Lazy Incremental Quasi-Newton Method

[PMLR][Arxiv]

AAKASH LAHOTI*, SPANDAN SENAPATI*, KETAN RAJAWAT, ALEC KOPPEL

Jan 2024

International Conference on Artificial Intelligence and Statistics (AISTATS)

Online Convex Optimization with Switching Cost and Delayed Gradients

[PER][PEVA][Arxiv]

SPANDAN SENAPATI, RAHUL VAZE

Aug 2023

IFIP Performance 2023. Full paper: Elsevier Performance Evaluation (PEVA), Extended abstract: ACM SIGMETRICS Performance Evaluation Review (PER)

Note: $\alpha - \beta$ denotes alphabetical ordering, which is custom in theoretical computer science research; * denotes equal contribution

Report

Fall'23 **Failure Cases of Empirical Risk Minimization (ERM) and Structural Risk Minimization (SRM)**, CSCI 699

[\[Report\]](#)

Honors & Awards

2022	Proficiency Medal , Best undergraduate project done by a graduating student from the CSE department	IIT Kanpur, India
2018, 19	Academic Excellence Award , For excellent academic performance in an academic year	IIT Kanpur, India
2018	All India Rank 161 , Joint Entrance Examination Main, among 1.5 Million Candidates	India
2018	All India Rank 191 , Joint Entrance Examination Advanced, among 200000 Candidates	India
2017	All India Rank 24 , KVPY Scholarship, Indian Institute of Science and Government of India	Bangalore, India
2016	NTSE Scholar , Awarded to the top 1000 students in the nation by the Government of India	India
2016	IJSO OCSC , Selected for the team selection camp of the International Junior Science Olympiad(top 35 India)	Mumbai, India
2017, 18	National Top 1% , National Standard Examination in Physics(NSEP) among 200000 Candidates	India
2018	National Top 1% , National Standard Examination in Chemistry(NSEC) among 200000 Candidates	India
2017, 18	State Top 1% , National Standard Examination in Astronomy(NSEA)	India
2017	3rd in State , Represented Odisha State in the Indian National Maths Olympiad(INMO)	India
2016	State Top 35 , Represented Odisha State in the Indian National Maths Olympiad (INMO)	India

Travel Grants

2024	GSG Professional Development Fund , Issued by USC
2023	National Science Foundation (NSF) Student Travel Award , Issued by IFIP Performance 2023

Talks

2023	IFIP Performance 2023 , Online Convex Optimization with Switching Cost and Delayed Gradients	Chicago, USA
2024	USC Theory Lunch , Optimal Multiclass U-Calibration Error and Beyond	Los Angeles, USA

Teaching

Fall'24	Teaching Assistant , Theoretical Machine Learning (CSCI 678)	USC
---------	---	---------------------

Skills

Programming	C, C++, Python
Machine Learning Framework	Pytorch

Reviewing

Machine Learning	Annual Conference on Neural Information Processing Systems (NeurIPS) 2024, 2025
Theoretical Computer Science	Annual Symposium on Foundations of Computer Science (FOCS) 2025 (External Reviewer)

Service

SHINE Mentor	USC
USC SUMMER HIGH SCHOOL INTENSIVE IN NEXT GENERATION ENGINEERING (SHINE)	
June 2024 - July 2024	
<ul style="list-style-type: none"> Mentored a high school student in building an online learning-based program that can beat a human user repeatedly in a game of rock-paper-scissors 	
Coordinator	IIT Kanpur
SPECIAL INTEREST GROUP IN MACHINE LEARNING(SIGML)	
May 2021 - Nov 2021	
<ul style="list-style-type: none"> Responsible for the smooth conduction of talks in different active areas of research in Machine Learning 	

Student Guide

IIT Kanpur

COUNSELLING SERVICE

July, 2019 - July 2020

- Responsible for the guidance and mentorship at a personal level of 5 freshman undergraduates and the smooth conduction of various events in the Orientation Session for the incoming Batch of Y19

Project Mentor

IIT Kanpur

ASSOCIATION OF COMPUTING ACTIVITIES (ACA)

Jan 2020 - Jun 2020

- Introduced Inference algorithms in Bayesian ML to a group of freshman undergraduates, and prepared assignments to track progress