Siddharth Vishwanath

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Current Position

University of California San Diego, *Department of Mathematics*
Stefan E. Warschawski Visiting Assistant Professor *08/2023–Present*

Education

Penn State University
Ph.D. in Statistics *08/2023*
- Advisor: Bharath Sriperumbudur
- Dissertation: *"Statistical Learning for Robust Topological Inference"*

Indian Institute of Technology (IIT) Kanpur
M.Sc. (Integrated) in Mathematics *06/2015*
- Thesis: *"Bayesian Inference and Optimal Schemes for Progressive Censoring"*

Previous Positions

IBM Research
AI Research Intern *05/2022–08/2022*

Statistical Consulting Center, Penn State
Research Assistant & Consultant *08/2019–05/2022*

The Institute of Statistical Mathematics, Tokyo
Visiting Student Researcher
- Host: Prof. Kenji Fukumizu *11/2019–01/2020*
- Host: Prof. Kenji Fukumizu & Prof. Satoshi Kuriki *06/2018–08/2018*

Goldman Sachs
Senior Quantitative Analyst *07/2016–08/2017*

Nomura
Quantitative Analyst *06/2015–07/2016*

Honors & Awards

NSF ACCESS Award [MTH250063]
Expanding Repelling-Attracting Hamiltonian Monte Carlo for Large-Scale Bayesian Inference Problems *10/2025*
750,000 Credits

ISBA Junior Travel Support
BayesComp 2025 *06/2025*

Alumni Association Dissertation Award
Penn State University *04/2023*

Travel Award
Geometric Data Analysis Conference, University of Chicago *06/2019*

Proficiency Medal
IIT Kanpur *06/2015*

Academic Excellence Award
IIT Kanpur *05/2015*

KVPY Fellowship
Department of Science & Technology (Government of India) *07/2010—06/2015*

Publications & Preprints

Google Scholar ID : 7TQaHEEAAAAJ

[1] **Confidence Sets For Multidimensional Scaling**
Siddharth Vishwanath and Ery Arias-Castro
Under Review at the Annals of Statistics (arXiv:2510.22452). 2025.

[2] **Minimax Optimality Of Classical Scaling Under General Noise Conditions**
Siddharth Vishwanath and Ery Arias-Castro
Under review at the Journal of the IMA: Information & Inference (arXiv:2502.00947). 2025.

[3] **Signal Recovery From Random Dot-Product Graphs Under Local Differential Privacy**
Siddharth Vishwanath and Jonathan Hehir
AISTATS. 2025.

[4] **Stability Of Sequential Lateration And Of Stress Minimization In The Presence Of Noise**
Ery Arias-Castro and Siddharth Vishwanath
SIAM Journal on Mathematics of Data Science (SIMODS). 2025.

[5] **On The Limits Of Topological Data Analysis For Statistical Inference**
Siddharth Vishwanath, Kenji Fukumizu, Satoshi Kuriki, and Bharath K Sriperumbudur
Foundations of Data Science. 2025.

[6] **Repelling-Attracting Hamiltonian Monte Carlo**
Siddharth Vishwanath and Hyungsuk Tak
Under revision at JMLR (arXiv:2403.04607). 2024.

[7] **Adversarially Robust Topological Inference**
Siddharth Vishwanath, Bharath K Sriperumbudur, Kenji Fukumizu, and Satoshi Kuriki
Under revision at JMLR (arXiv:2206.01795). 2022.

[8] **The Shape Of Edge Differential Privacy**
Siddharth Vishwanath and Jonathan Hehir
Theory and Practice of Differential Privacy Workshop. ICML. 2021.

[9] **Robust Persistence Diagrams Using Reproducing Kernels**
Siddharth Vishwanath, Kenji Fukumizu, Satoshi Kuriki, and Bharath K Sriperumbudur
NeurIPS. 2020.

[10] **Monolith Soil Core Sampling To Develop Nitrate Testing Protocol For Manure Injection**
Robert J Meinen, Douglas B Beegle, Siddharth Vishwanath, Peter JA Kleinman, Louis S Saporito, et al.
Soil Science Society of America Journal. 2023.

[11] **Bayesian Inference And Optimal Censoring Scheme Under Progressive Censoring**
Siddharth Vishwanath and Debasis Kundu
Advances In Reliability And System Engineering. 2016.

Selected Talks & Presentations

Invited Talks

International Symposium on Nonparametric Statistics (ISNPS 2026)
Minimax Signal Recovery in Random Dot-Product Graphs under Local Differential Privacy — *06/2026**

Combinatorics & Probability Seminar, UC Irvine
A Statistical Framework for Multidimensional Scaling — *12/2025**

BayesComp 2025
Repelling-Attracting Hamiltonian Monte Carlo — *07/2025*

Flatiron Institute, Center for Computational Mathematics
Repelling-Attracting Hamiltonian Monte Carlo — *06/2024*

*upcoming

Center for Astrostatistics (CAst) Seminar, Penn State
Repelling-Attracting Hamiltonian Monte Carlo *08/2022*

Stochastic Modeling and Computational (SMAC) Statistics Seminar, Penn State
Statistical Inference for Topological Data Analysis *09/2021*

Contributed Talks & Presentations

Joint Math Meetings (JMM 2025)
Outwitting Outliers: A framework for computing persistence diagrams under adversarial contamination *01/2025*

JuliaCon 2023
Automatic Differentiation for Statistical and Topological Losses *07/2023*

Joint Statistical Meetings (JSM 2021)
Efficient and Robust Topological Inference using Reproducing Kernels *08/2021*

IMSI Workshop on Topological Data Analysis
Robust Persistence Diagrams using Reproducing Kernels *04/2021*

NeurIPS 2020
Robust Persistence Diagrams using Reproducing Kernels *12/2020*

Joint Statistical Meetings (JSM 2020)
Statistical Invariance of Betti Numbers in the Thermodynamic Regime *08/2020*

Applied Topology: Methods, Computation,and Sciences (ATMCS) Conference
Statistical Invariance of Betti Numbers in the Thermodynamic Regime *04/2021*

Geometric Data Analysis Conference, University of Chicago
Statistical Invariance of Betti Numbers in the Thermodynamic Regime *05/2019*

Teaching

Data Analysis and Inference
UC San Diego, Math 189 *Winter 2024, Spring 2024, Fall 2024, Winter 2025*

Statistical Methods
UC San Diego, Math 183 *Fall 2023, Winter 2024, Fall 2024, Spring 2025*

Data Science Through Statistical Reasoning
Penn State, Stat 380 *Spring 2023*

Foundations of Mathematical Statistics
Penn State, Math/Stat 319 *Fall 2022*

Service & Leadership

Workshops & Meetings

AMS Special Session on the Mathematics of Interpretable, Explainable and Adversarial AI (JMM 2025)
Organizer *01/2025*

Bioinformatics Workshop at Maharani Laxmi Ammanni College for Women
Tutorial Organizer *06/2016*
Conducted a three day session on statistical analysis for biostatistics with hands-on experience using R.

Professional Service

Reviewer *05/2019—Present*

- Journals: Journal of Machine Learning Research, Annals of Statistics, Electronic Journal of Statistics, Foundations of Data Science.
- Conferences: NeurIPS, ICML, AISTATS, ICLR.

Professional Membership *05/2018—Present*

- American Mathematical Society (AMS), American Statistical Association (ASA), Institute of Mathematical Statistics (IMS), International Society for Bayesian Analysis (ISBA).

Mentoring

Student Foundation Investment Committee (SFIC), UC San Diego
Faculty Advisor *11/2024–09/2025*

Penn State Statistics Graduate Students' Association (SGSA)
Graduate Mentor *05/2018–05/2020*

- Research and professional mentoring for incoming PhD students, and served on student discussion panels.
- Organized the workshops on Tidyverse & Functional Programming in R (2018, 2019, 2020, 2021), Git & version control (2022), Topological Data Analysis (2020).

Statistical Learning Theory Working Group Penn State
Co-Organizer *08/2018–05/2019*

Students' Senate, IIT Kanpur
Finance Convener & Undergraduate Senate Representative *07/2013–05/2015*

Miscellaneous

Open Source Projects

- TDAOpt.jl: *Julia package for automatic-differentiation of statistical & topological loss functions.*
- RobustTDA.jl: *Julia package for flexible & robust computation of persistent homology in the presence of noise.*
- RA-HMC.jl: *Julia package for sampling from high-dimensional multimodal distributions using RA-HMC.*
- Robust PDs: *R codebase for computing robust persistence diagrams using reproducing kernels.*

Programming Julia, Python, R ■■■■■ C/C++, SQL, HTML, CSS ■■■■■ LaTeX■■■■■

Frameworks (F)Lux.jl, Turing.jl, SciML, JAX, PyTorch, NumPy, Pandas, SciPy, Polars, Data.Table, Tidyverse