

Shikha Singh

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EDUCATION

Stony Brook University, New York 2013–2018
PhD in Computer Science,
Advisors: Prof. Michael Bender and Prof. Jing Chen

Indian Institute of Technology, Kharagpur 2008–2013
Integrated MSc. in Mathematics and Computing,
Advisor: Prof. Pratima Panigrahi

ACADEMIC APPOINTMENTS

Assistant Professor, Williams College, Williamstown 2019–Present

Visiting Research Scholar, Carnegie Mellon University, Pittsburgh Fall 2022

Assistant Professor, Wellesley College, Wellesley 2018–2019

Visiting Researcher, Max-Planck-Institute Saarbrücken, Germany Aug–Oct 2015

TEACHING EXPERIENCE

Williams College

CS256: Algorithm Design and Analysis	Fall 19, Spring 20 & Spring 21
CS134: Introduction to Computer Science	Spring 20, Fall 21 & Spring 24
CS357: Algorithmic Game Theory	Fall 21 & Spring 22
CS15: Exploring Bias in Computing	Winter Study 2022

Wellesley College

CS235: Languages and Automata	Fall 2018
CS111: Introduction to Programming and Problem Solving	Spring 2019

PROFESSIONAL SERVICE

Organizer, Dagstuhl Seminar (# 25181) April 2025
Learned Predictions for Data Structures and Running Time
Co-organizers: Inge Li Gørtz, Benjamin J. Moseley and Sergei Vassilvitskii

Journal Editor, Theoretical Computer Science 2021–2022
Fun with Algorithms 2020 Special Issue

Program Committee Member

Workshop on Models & Algorithms for Planning & Scheduling Problems (MAPSP)	2024
Theory and Applications of Models of Computation (TAMC)	2024
Symposium on Experimental Algorithms (SEA)	2022
European Symposium on Algorithms Track S (ESA-S)	2022
Mathematical Foundations of Computer Science (MFCS)	2021
Symposium on Algorithmic Engineering and Experiments (ALENEX)	2021
European Conference on Parallel and Distributed Computing (Euro-Par)	2020
Fun with Algorithms (FUN)	2020
Symposium on Simplicity in Algorithms (SOSA)	2020

Grant Review Panelist
National Science Foundation

2021 & 2019

INSTITUTIONAL SERVICE

Williams College

Standing Grievance Panel Elected Member	2022-2023, 2024-2025
Children's Center Parental Advisory Committee Member	2023-2024
Science Executive Committee Junior Faculty Representative	2021-2022
Williams-Exeter Programme in Oxford Selection Committee Member	2021-2022
Inclusive Williams Roundtable Program Group Coordinator	Spring 21
Committee on Diversity and Community Member	2020-2021
Computer Science Colloquium Chair	2020-2021, 2021-2022
Women in Computer Science Faculty Coordinator	2019-2020, 2021-2022, Spring 2024
Underrepresented Identities in CS (UniCS) Faculty Coordinator	2020-2021

Wellesley College

Diversity and Inclusion Subcommittee Member	2018-2019
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Stony Brook University

Graduate Women in Science and Engineering (GWISE) President	2017-2018
Graduate Women in Science and Engineering (GWISE) Vice-President	2016-2017

UNDERGRADUATE ADVISING

Honors Thesis Advisee, Jonathan Rogers '23 2022–2023

Received CRA Outstanding Undergraduate Research Award Honorable Mention
Now in graduate school at CMU

Honors Thesis Advisee, David Lee '21 2022–2023

Received CRA Outstanding Undergraduate Research Award Honorable Mention
Now in graduate school at Cornell

Research Assistants

Samantha Kilcoyne '23.5	Summer 2022
Eva Borton '23	Summer 2022
Max Enis '24	2021-2022
Jackson Ehrenworth '23	2021-2022
Max Stein '21	Summer & Winter 2020
Jackson Bibbens '22	Summer 2021
David Lee '21	Summer 2020 & 2021
Tai Henrichs '23	Summer 2020

FELLOWSHIPS AND GRANTS

NSF CISE Research Initiation Initiative (CRII) Grant 2020-2022

Two-year award in the amount \$154,597

John Marburger III Fellowship for Science, Engineering, and Mathematics 2017

Graduate school award, in the amount of \$5,000, offered by Stony Brook University

Chateaubriand Fellowship (STEM) 2015–2016

Offered by the Embassy of France in the U.S. to conduct research in France

Renaissance Technology Fellowship, Stony Brook University 2013–2016

3-year grant offered to one outstanding incoming CS PhD student each year

REFEREED CONFERENCE PUBLICATIONS

Author order is *alphabetical* except when indicated with *, Acceptance rate stated when known

- Unbalanced Random Matching Markets with Partial Preferences** In Submission
A. Potukuchi and S. Singh , Preprint available on arXiv
- Incremental Topological Ordering and Cycle Detection with Predictions** ICML 2024
International Conference on Machine Learning , Acceptance rate: 27.5%
S. McCauley, B. Moseley, A. Niaparast, and S. Singh
- Online List Labeling with Predictions** NeurIPS 2023
Conference on Neural Information Processing Systems , Acceptance rate: 26.1%
S. McCauley, B. Moseley, A. Niaparast, and S. Singh
Chosen as Spotlight, Acceptance rate: 3%
- Verifiable Crowd Computing: Coping with Bounded Rationality** IJTCS 2022
International Joint Conference on Theoretical Computer Science
L. Dong, M. A. Mosteiro, and S. Singh
- Telescoping Filter: A Practical Adaptive Filter** ESA 2021
European Symposium on Algorithms , Acceptance rate: 25%
D. Lee, S. McCauley, S. Singh, and M. Stein.
- Microteaching: Semantics, definition of a computer, running times, fractal trees, classes as encapsulation, and P vs NP** SIGCSE 2021
Technical Symposium on Computer Science Education
C. M. Lewis, K. Fisler, J. Hinz, D. J. Malan, J. E. Paley, M. A. Perez-Quinones, and S. Singh.
* Non-alphabetical ordering
- Timely Reporting of Heavy Hitters using External Memory** SIGMOD 2020
International Conference on Management of Data , Acceptance rate: 26.9%
P. Pandey*, S. Singh*, M. A. Bender, J. W. Berry, M. Farach-Colton, R. Johnson, T. Kroeger, & C. Phillips.
* Joint first authors, non-alphabetical ordering
- A Scheduling Approach to Incremental Maintenance of Datalog Programs** IPDPS 2020
International Parallel and Distributed Processing Symposium , Acceptance rate: 24.7%
Shikha Singh*, Sergey Madaminov, Michael Bender, Michael Ferdman, Ryan Johnson, Benjamin Moseley, Hung Ngo, Dung Nguyen, Soeren Olesen, Kurt Stirewalt, Geoffrey Washburn.
* First author, non-alphabetical ordering
- Non-Cooperative Rational Interactive Proofs** ESA 2019
European Symposium on Algorithms , Acceptance rate: 28%
J. Chen, S. McCauley, and S. Singh
- Bloom Filters, Adaptivity, and the Dictionary Problem** FOCS 2018
Symposium on Foundations of Computer Science , Acceptance rate: 26.9 %
M. A. Bender, M. Farach-Colton, M. Goswami, R. Johnson, S. McCauley, and S. Singh
- Efficient Rational Proofs with Strong Utility-Gap Guarantees** SAGT 2018
Symposium on Algorithmic Game Theory , Acceptance rate: 35.2 %
J. Chen, S. McCauley, and S. Singh
- Approximating k -Forest with Resource Augmentation** COCOA 2017
Conference on Combinatorial Optimization and Applications , Acceptance rate: 40.7 %
E. Angel, K. T. Nguyen, and S. Singh
Best Paper Runner-Up Award
- Anti-Persistence on Persistent Storage** PODS 2016
Principles of Database Systems , Acceptance rate: 32.9%
M. A. Bender, J. Berry, R. Johnson, T. M. Kroger, S. McCauley,
C. A. Phillips, B. Simon, S. Singh, and D Zage

Rational Proofs with Multiple Provers <i>Innovations in Theoretical Computer Science</i> , Acceptance rate: 28.2% J. Chen, S. McCauley, and S. Singh	ITCS 2016
Resource Optimization for Program Committee Members <i>Fun with Algorithms</i> , Acceptance rate: 40.9% M. A. Bender, S. McCauley, B. Simon, S. Singh, and F. Vivien	FUN 2016
The I/O Complexity of Computing Prime Tables <i>Latin American Theoretical Informatics Symposium</i> , Acceptance rate: 39.7% M. A. Bender, R. Chowdhury, A. Conway, M. Farach-Colton, P. Ganapathi, R. Johnson, S. McCauley, B. Simon, and S. Singh	LATIN 2016
Run Generation Revisited: What Goes Up May or May Not Come Down <i>International Symposium on Algorithms and Computation</i> , Acceptance rate: 36.1% M. A. Bender, S. McCauley, A. McGregor, S. Singh, and H. Vu	ISAAC 2015

REFEREED JOURNAL PUBLICATIONS

Author order is *alphabetical* except when indicated with *

Verifiable Crowd Computing: Coping with Bounded Rationality <i>Theoretical Computer Science</i> L. Dong, M. A. Mosteiro, and S. Singh	TCS 2024
Using Advanced Data Structures to Enable Responsive Security Monitoring <i>Cluster Computing</i> J. Vorobyeva*, D. Delayo*, M. A. Bender, M. Farach-Colton, P. Prashant, C. A. Phillips, S. Singh, E. Thomas, and T. Kroeger. * Joint first authors, non-alphabetical ordering	Cluster 2021
Timely Reporting of Heavy Hitters using External Memory <i>ACM Transactions on Database Systems</i> S. Singh*, P. Pandey*, M. A. Bender, J. W. Berry, M. Farach-Colton, R. Johnson, T. Kroeger, & C. A. Phillips. * Joint first authors, non-alphabetical ordering	TODS 2021
Approximating k-Forest with Resource Augmentation <i>Theoretical Computer Science</i> E. Angel, K. T. Nguyen, and S. Singh	TCS 2019

NEWS AND MEDIA

Research featured in https://techxplore.com/ & CMU Tepper News <i>New machine learning method predicts future data patterns to optimize data storage</i>	Feb 2024
Faculty focus article in Williams College News <i>Computer Science Professor Shikha Singh Awarded NSF Grant</i>	2020
Student focus article in Stony Brook CS News <i>First Computer Science John Marburger III Fellowship Awardee</i>	2018
Research featured in American Mathematical Society Popular Math Book <i>The Truth Shall Set Your Free, "What's Happening in the Mathematical Sciences", Volume 10</i>	2015

PRESENTATIONS AND PANELS

Workshop Presentation, Stony Brook International Conference on Game Theory <i>Stable Matchings in Random Markets</i>	July 2024
Workshop Presentation, Models & Algorithms for Planning & Scheduling Problems <i>Unbalanced Random Matching Markets with Partial Preferences</i>	May 2024

Seminar Presentation, New Challenges in Scheduling Theory <i>Sharp Thresholds for the Existence of Perfect Stable Matchings</i>	May 2024
CS Colloquium Invited Talk, Indian Institute of Technology, Kanpur <i>Online List Labeling with Predictions</i>	Nov 2023
Williams CS Colloquium Invited Talk, Williams College <i>Leveraging ML Predictions for Beyond-Worst-Case Algorithm Design</i>	Dec 2023
Science Center Lunch Talk, Williams College <i>Algorithms with Predictions: The Universe is Not Always Conspiring Against Us</i>	Nov 2023
Seminar Presentation, Dagstuhl Seminar on Scalable Data Structures <i>Online List Labeling with Predictions</i>	May 2023
CS Colloquium Invited Talk, University of Iowa <i>Timely Detection of Heavy Hitters</i>	Oct 2022
Tepper School Colloquium Invited Talk, Carnegie Mellon University <i>Timely Detection of Heavy Hitters</i>	Oct 2022
Workshop Presentation, Models & Algorithms for Planning & Scheduling Problems <i>A Scheduling Problem for PC Members</i>	June 2022
Workshop Presentation, New Perspectives in Scheduling Theory <i>Timely Detection of Heavy Hitters</i>	May 2022
Panelist, Faculty Orientation Program, Williams College <i>Perspectives on Teaching and Learning Panel</i>	Sep 2021
Teaching Demonstration, SIGCSE Technical Symposium <i>Microteaching Panel: P vs NP</i>	Mar 2021
Brown Bag Lunch Talk, Economics Department, Williams College <i>The Mechanism Design Approach to Interactive Proofs</i>	Jan 2021
CS Theory Seminar Invited Talk, Harvard University <i>The Mechanism Design Approach to Interactive Proofs</i>	Nov 2020
CS Theory Seminar Invited Talk, University of Massachusetts Amherst <i>Timely Detection of Heavy Hitters in External Memory</i>	Oct 2019
CS Theory Seminar Invited Talk, Weizmann Institute of Technology, Israel <i>Non-Cooperative Rational Proofs</i>	Jul 2019
CS Theory Seminar Invited Talk, Bar-Ilan University, Israel <i>The Online Event Detection Problem</i>	Jun 2019
CS Colloquium Invited talk, Indian Institute of Technology, Kanpur <i>Exact Heavy-hitters in External Memory</i>	May 2019
Seminar Talk, Dagstuhl Seminar on Theoretical Foundations of Storage Systems <i>Bloom Filters, Adaptivity and the Dictionary Problem</i>	Mar 2019
CS Theory Seminar Invited Talk, Rutgers University, New Jersey <i>Bloom Filters, Adaptivity and the Dictionary Problem</i>	Feb 2019
CS Theory Seminar Invited Talk, Max-Planck-Institute Saarbrucken, Germany <i>Rational Proofs</i>	Aug 2015
CS Theory Seminar Invited Talk, LIP6, Sorbonne University, Paris <i>Competitive Analysis of Online and Offline Sorting with a Buffer</i>	Feb 2016