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 Saarbrucken, 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 2021 & 2019
National Science Foundation

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

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, SIGCSE 2021
fractal trees, classes as encapsulation, and P vs NP
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 ITCS 2016
Innovations in Theoretical Computer Science , Acceptance rate: 28.2%
J. Chen, S. McCauley, and S. Singh

Resource Optimization for Program Committee Members FUN 2016
Fun with Algorithms , Acceptance rate: 40.9%
M. A. Bender, S. McCauley, B. Simon, S. Singh, and F. Vivien

The I/O Complexity of Computing Prime Tables LATIN 2016
Latin American Theoretical Informatics Symposium , 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

Run Generation Revisted: What Goes Up May or May Not Come Down ISAAC 2015
International Symposium on Algorithms and Computation , Acceptance rate: 36.1%
M. A. Bender, S. McCauley, A. McGregor, S. Singh, and H. Vu

REFEREED JOURNAL PUBLICATIONS

*Author order is **alphabetical** except when indicated with ⋆*

Verifiable Crowd Computing: Coping with Bounded Rationality TCS 2024
Theoretical Computer Science
L. Dong, M. A. Mosteiro, and S. Singh

Using Advanced Data Structures to Enable Responsive Security Monitoring Cluster 2021
Cluster Computing
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

Timely Reporting of Heavy Hitters using External Memory TODS 2021
ACM Transactions on Database Systems
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

Approximating k-Forest with Resource Augmentation TCS 2019
Theoretical Computer Science
E. Angel, K. T. Nguyen, and S. Singh

NEWS AND MEDIA

Research featured in `https://techxplore.com/` & CMU Tepper News Feb 2024
New machine learning method predicts future data patterns to optimize data storage

Faculty focus article in **Williams College News** 2020
Computer Science Professor Shikha Singh Awarded NSF Grant

Student focus article in **Stony Brook CS News** 2018
First Computer Science John Marburger III Fellowship Awardee

Research featured in **American Mathematical Society Popular Math Book** 2015
The Truth Shall Set Your Fee, "What's Happening in the Mathematical Sciences", Volume 10

PRESENTATIONS AND PANELS

Workshop Presentation, **Stony Brook International Conference on Game Theory** July 2024
Stable Matchings in Random Markets

Workshop Presentation, **Models & Algorithms for Planning & Scheduling Problems** May 2024
Unbalanced Random Matching Markets with Partial Preferences

Seminar Presentation, **New Challenges in Scheduling Theory** May 2024
Sharp Thresholds for the Existence of Perfect Stable Matchings

CS Colloquium Invited Talk, **Indian Institute of Technology, Kanpur** Nov 2023
Online List Labeling with Predictions

Williams CS Colloquium Invited Talk, **Williams College** Dec 2023
Leveraging ML Predictions for Beyond-Worst-Case Algorithm Design

Science Center Lunch Talk, **Williams College** Nov 2023
Algorithms with Predictions: The Universe is Not Always Conspiring Against Us

Seminar Presentation, **Dagstuhl Seminar on Scalable Data Structures** May 2023
Online List Labeling with Predictions

CS Colloquium Invited Talk, **University of Iowa** Oct 2022
Timely Detection of Heavy Hitters

Tepper School Colloquium Invited Talk, **Carnegie Mellon University** Oct 2022
Timely Detection of Heavy Hitters

Workshop Presentation, **Models & Algorithms for Planning & Scheduling Problems** June 2022
A Scheduling Problem for PC Members

Workshop Presentation, **New Perspectives in Scheduling Theory** May 2022
Timely Detection of Heavy Hitters

Panelist, **Faculty Orientation Program, Williams College** Sep 2021
Perspectives on Teaching and Learning Panel

Teaching Demonstration, **SIGCSE Technical Symposium** Mar 2021
Microteaching Panel: P *vs* NP

Brown Bag Lunch Talk, **Economics Department, Williams College** Jan 2021
The Mechanism Design Approach to Interactive Proofs

CS Theory Seminar Invited Talk, **Harvard University** Nov 2020
The Mechanism Design Approach to Interactive Proofs

CS Theory Seminar Invited Talk, **University of Massachusetts Amherst** Oct 2019
Timely Detection of Heavy Hitters in External Memory

CS Theory Seminar Invited Talk, **Weizmann Institute of Technology, Israel** Jul 2019
Non-Cooperative Rational Proofs

CS Theory Seminar Invited Talk, **Bar-Ilan University, Israel** Jun 2019
The Online Event Detection Problem

CS Colloquium Invited talk, **Indian Institute of Technology, Kanpur** May 2019
Exact Heavy-hitters in External Memory

Seminar Talk, **Dagstuhl Seminar on Theoretical Foundations of Storage Systems** Mar 2019
Bloom Filters, Adaptivity and the Dictionary Problem

CS Theory Seminar Invited Talk, **Rutgers University, New Jersey** Feb 2019
Bloom Filters, Adaptivity and the Dictionary Problem

CS Theory Seminar Invited Talk, **Max-Planck-Institute Saarbrucken, Germany** Aug 2015
Rational Proofs

CS Theory Seminar Invited Talk, **LIP6, Sorbonne University, Paris** Feb 2016
Competitive Analysis of Online and Offline Sorting with a Buffer