Mandar Juvekar

Email: mandarj@bu.edu • Homepage: https://cs-people.bu.edu/mandarj

Research Interests

I am broadly interested in theoretical computer science, though my current interests revolve around computational complexity, cryptography, and the interplay between the two.

Keywords related to current projects: query and communication complexity, real polynomial approximations to Boolean functions, probabilistic proof systems, SNARGs.

Education

2022-present   **Boston University**
PhD in Computer Science
Advisors: Mark Bun, Adam Smith.
Supported in part by a Dean's Fellowship.

2018-2022   **University of Rochester**
BS in Computer Science with Highest Honors in Research and Highest Distinction
BS in Mathematics with Honors and Highest Distinction
Cumulative GPA: 3.97 - *magna cum laude*
Elected to the Phi Beta Kappa honor society.

Honors

2022   **Chairs Fellowship**, *Boston University Department of Computer Science*

2022   **Outstanding Senior Award**, *UR Department of Computer Science*
The department's highest honor at graduation, awarded to a senior "who has made outstanding contributions to the department and its undergraduate program in academics, research, and student leadership, and who has gained the respect and appreciation of the department community."

2022   **Award for Excellence in Undergraduate Research**, *UR Department of Computer Science*
Awarded to two members of the graduating class "who have worked on significant research, received awards, presented at conferences, and/or been published as a result of their work."

2022   **Honorable Mention**, *CRA Outstanding Undergraduate Researcher Awards*

2021   **Young Researchers' Award**, *Computational Geometry: Theory & Applications*
Annual journal award for authors under 35. Awarded for *Distinct distances with ℓ_p metrics*.

Journal Articles

[1] Lane A. Hemaspaandra, Mandar Juvekar, Arian Nadjimzadah, and Patrick A. Phillips. Gaps, ambiguity, and establishing complexity-class containments via iterative constant-setting. *ACM Trans. Comput. Theory*, 2024. *To appear. Pre-print:* arxiv.org/abs/2109.147648.

[2] Mandar Juvekar and Arian Nadjimzadah. Notions of tensor rank. *Online Journal of Analytic Combinatorics*, 2024. *To appear. Pre-print:* arxiv.org/abs/2210.01183.

[3] Gene Louis Kim, Mandar Juvekar, Junis Ekmekciu, Viet Duong, and Lenhart Schubert. Monotonic inference with unscoped episodic logical forms: From principles to system. *Journal of Logic, Language and Information*, 2023.

[4] Polly Matthews Jr. Distinct distances with ℓ_p metrics. *Computational Geometry*, 100:101785, 2022. *Published under a pseudonym. Paper contains a list of authors.*

Conference Articles

[5] Mandar Juvekar, Gene Kim, and Lenhart Schubert. Semantically informed data augmentation for unscoped episodic logical forms. In *Proceedings of the 15th International Conference on Computational Semantics (IWCS)*, pages 116–133, 2023.

[6] Lane A. Hemaspaandra, Mandar Juvekar, Arian Nadjimzadah, and Patrick A. Phillips. Gaps, ambiguity, and establishing complexity-class containments via iterative constant-setting. In *47th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 57:1–57:15, 2022.

[7] Gene Kim, Mandar Juvekar, and Lenhart Schubert. Monotonic inference for underspecified episodic logic. In *Proceedings of the 1st and 2nd Workshops on Natural Logic Meets Machine Learning (NALOMA)*, pages 26–40, June 2021.

[8] Gene Louis Kim, Mandar Juvekar, Junis Ekmekciu, Viet Duong, and Lenhart Schubert. A (mostly) symbolic system for monotonic inference with unscoped episodic logical forms. In *Proceedings of the 1st and 2nd Workshops on Natural Logic Meets Machine Learning (NALOMA)*, pages 71–80, June 2021.

Talks and Presentations

2022   Gaps, ambiguity, and establishing complexity-class containments via iterative constant-setting. *47th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, August 2022.

2020   Monotonic inference for underspecified episodic logic. *1st Workshop on Natural Logic Meets Machine Learning (NALOMA)*, July 2020.

Research Experience

Summer 2023   **Summer school in probabilistic proof systems**
              Organized by Alessandro Chiesa and SL Math in Zürich, Switzerland.

2022-present **Polynomial approximations to Boolean functions**
              Boston Univeristy, with Mark Bun (work in progress).

2021-2022   **Independent Research in Structural Complexity Theory**
              University of Rochester, Advisor: Lane Hemaspaandra
              Papers: [1, 6]

2019-2022   **Natural Language Processing**
              University of Rochester, Advisor: Lenhart Schubert
              Papers: [5, 7, 8]

Summer 2021   **Summer Undergraduate Research Fellow in Mathematics**
              California Institute of Technology, Advisor: Nets Katz

Summer 2020   **Polymath REU**
              Remote, Advisor: Adam Sheffer
              Paper: [4]

Teaching Experience

Fall 2023   **Teaching Assistant: Graduate complexity theory**, Boston University

Summer 2023   **Teaching Assistant**, *New Horizons in Theoretical Computer Science*
              Led small-group problem-solving sessions, organized course logistics, and ran social activities at a week-long online summer school aimed at exposing undergraduate students to research topics in theoretical computer science.

Summer 2022   **Instructor**, TRIPODS REU 2022, University of Rochester

Taught a four-week reading course on computational learning theory and mentored undergraduate students on projects in machine learning and natural language processing.

2019-2022   **Undergraduate Teaching Assistant**, University of Rochester
Undergraduate teaching assistant for: Design & Analysis of Efficient Algorithms (twice), Computer Models & Limitations, Computer Organization (twice), Calculus I and II.

2019-2022   **University of Rochester Splash**
Designed and taught hour-long classes at events aimed at local high-school students.

Summer 2020   **Instructor**, TRIPODS REU 2020, University of Rochester
Helped organize the TRIPODS REU 2020 on higher-dimensional probability with applications to data science. Wrote Python worksheets for the program and facilitated programming sessions.

Summer 2020   **Summer HSSP**, Educational Studies Program, MIT
Designed and co-taught two 6-week courses for high-school students: one on mathematics and physics concepts in audio and music, and one on the axiomatic construction of numbers.

2019-2020   **Peer Tutor**, Center for Excellence in Teaching and Learning, University of Rochester
Tutored various computer science and mathematics courses.

Service and Leadership

2022, 2023   **Co-organizer**, TRIPODS REU, University of Rochester.
Principal organizer: Alex Iosevich.

2019-2022   **President**, University of Rochester Splash
President (since 2020), and formerly Vice-President (2019), of UR Splash, a student organization at the University of Rochester focused on educational outreach to local high-school students.

2018, 2019   **Mentor**, Google Summer of Code
Mentored undergraduate students on open-source coding projects for the Google Summer of Code program (2018 and 2019) with the Terasology, an open-source game development organization.