

Abhranil Chatterjee

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ABOUT ME

I am a visiting faculty in the School of Computer Sciences at National Institute of Science Education and Research, Bhubaneswar since November, 2022. Previously, I was a postdoctoral researcher in the Department of Computer Science and Engineering at Indian Institute of Technology, Bombay from September, 2021 to October, 2022.

CONTACT INFORMATION

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PAST EDUCATION

I did Ph.D. in theoretical computer science from The Institute of Mathematical Sciences (HBNI), Chennai under the guidance of V. Arvind and Partha Mukhopadhyay. I received M.E. in Computer Science and Engineering from Jadavpur University in 2016. I completed B.Tech in Computer Science and Engineering from Kalyani Government Engineering College in 2013. I have worked at Tata Consultancy Services from September, 2013 - February, 2014.

RESEARCH INTERESTS

My research interest broadly lies in computational complexity theory and algorithm design. Specifically, I am interested in algebraic complexity theory, designing algorithms with algebraic techniques.

PUBLICATIONS

1. **On Black-box Rational Identity Testing and Noncommutative Rank over the Free Skew Field**, with V. Arvind, Utsab Ghosal, Partha Mukhopadhyay, and C. Ramya, *ITCS, 2023*.
2. **Black-box Identity Testing of Noncommutative Rational Formulas of Inversion Height Two in Deterministic Quasipolynomial-time**, with V. Arvind and Partha Mukhopadhyay, *RANDOM, 2022*.
3. **Equivalence Testing of Weighted Automata over Partially Commutative Monoids**, with V. Arvind, Rajit Datta, and Partha Mukhopadhyay, *MFCS, 2021*.
4. **A Special Case of Rational Identity Testing and the Brešar-Klep Theorem**, with V. Arvind, Rajit Datta, and Partha Mukhopadhyay, *MFCS, 2020*.
5. **Fast Exact Algorithms Using Hadamard Product of Polynomials**, with V. Arvind, Rajit Datta, and Partha Mukhopadhyay, *FSTTCS, 2019; ALGORITHMICA, 2022*.
6. **On Explicit Branching Programs for the Rectangular Determinant and Permanent Polynomials**, with V. Arvind, Rajit Datta, and Partha Mukhopadhyay, *ISAAC, 2019, Chicago Journal of Theoretical Computer Science, 2020*.
7. **Efficient Black-Box Identity Testing for Free Group Algebras**, with V. Arvind, Rajit Datta, and Partha Mukhopadhyay, *RANDOM, 2019*.
8. **Univariate Ideal Membership Parameterized by Rank, Degree, and Number of Generators**, with V. Arvind, Rajit Datta and Partha Mukhopadhyay, *FSTTCS, 2018; ToCS, 2021*.

PREPRINTS

1. **Border Complexity of Symbolic Determinant under Rank One Restriction**,
with Sumanta Ghosh, Rohit Gurjar, and Roshan Raj,
manuscript under review.
1. **A Unified Lower Bound Technique for Noncommutative Computation**,
with V. Arvind,
manuscript in preparation.

PROFESSIONAL EXPERIENCES

- **Talks:** I have presented our work in the following conferences, workshops, and seminars.
 - **Conferences:** RANDOM(2019) @MIT, FSTTCS(2019) @IIT Bombay, MFCS(2020) @online, MFCS(2021) @online, RANDOM(2022) @online.
 - **Workshops:** WACT @ICTS(2019).
 - **Seminars:** at IMSc, IIT Kanpur, IIT Bombay, ISI Kolkata, IIT Hyderabad, NISER Bhubaneswar, IIT Palakkad.
- I have reviewed papers as a subreviewer in the following conferences: STACS(2020), ESA(2020), STOC(2021), SODA(2021), CCC(2022), LATIN(2022), WALCOM(2023).
- I was the teaching assistant for the course “Computational Complexity Theory” taught by V. Arvind at IMSc, Chennai (2019, Jan-May).
- I have taught at summer school (2019) organized at IMSc.

REFERENCES

1. V. Arvind, Professor, The Institute of Mathematical Sciences, Chennai,
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2. Partha Mukhopadhyay, Associate Professor, Chennai Mathematical Institute,
email id: partham@cmi.ac.in.
3. Mrinal Kumar, Assistant Professor, Indian Institute of Technology, Bombay,
email id: mrinal@cse.iitb.ac.in.
4. Rohit Gurjar, Assistant Professor, Indian Institute of Technology, Bombay,
email id: rgurjar@cse.iitb.ac.in.
5. Meena Mahajan, Professor, The Institute of Mathematical Sciences, Chennai,
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