Curriculum Vitae

ATRI RUDRA

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Department of Computer Science and Engineering
338 Davis Hall
University at Buffalo, SUNY
Buffalo, NY, 14260.
Phone: (716) 645-2464
Webpage: http://www.cse.buffalo.edu/~atri
Email: atri@buffalo.edu

1 Education

- *Ph.D.*, The University of Washington, Seattle, WA. 2007
  Department of Computer Science and Engineering
  Thesis: "*List Decoding and Property Testing of Error Correcting Codes*"
  Advisor: Venkatesan Guruswami
- *M.S.*, The University of Washington, Seattle, WA. 2005
  Department of Computer Science and Engineering
- *Graduate Student*, The University of Texas at Austin, Austin, TX. 2002-2004
  Department of Computer Sciences
- *B. Tech.*, Indian Institute of Technology, Kharagpur, India. 2000
  Department of Computer Science and Engineering

2 Employment History

- *Department Chair,* *March 2025 – present*
  AI and Society, University at Buffalo
- *Katherine Johnson Chair in Artificial Intelligence,* *Jan 2023 – present*
  Computer Science & Eng., University at Buffalo
- *Professor,* Computer Science & Eng., University at Buffalo *Sept 2019 – present*
- *Visting Associate Professor,* Computer Science, Stanford University *Oct 2020 – May 2021*
- *Associate Professor,* Computer Science & Eng., University at Buffalo *Sept 2013 – Aug 2019*
- *Assistant Professor,* Computer Science & Eng., University at Buffalo *Sept 2007 – Aug 2013*
- *Summer Intern,* IBM Almaden Research Center, San Jose, CA *Jun – Sep 2006*
- *Summer Intern,* IBM TJ Watson Research Center, Yorktown Heights, NY *Jun – Sep 2005*
- *Summer Intern,* Amazon.com, Seattle, WA *May – Aug 2003*

- *Research Staff Member,* IBM India Research Lab, New Delhi, India *July 2000 – June 2002*
- *Summer Intern,* IBM India Research Lab, New Delhi, India *May – July 1999*

3 Awards

- *ACM PODS Alberto O. Mendelzon Test-of-Time Award*, 2025.
- *Best Paper award at Efficient Systems for Foundation Models (ES-FoMo),* Workshop at ICML, 2024.
- *ICML Outstanding Paper Runner Up Award*, 2022.
- *Best Paper award at Hardware Aware Efficient Training (HAET),* Workshop at ICML, 2022.
- *SUNY Chancellor's Award for Excellence in Teaching*, 2022.
- *UB Exceptional Scholars-Sustained Achievement Award*, 2022.
- *ACM PODS Alberto O. Mendelzon Test-of-Time Award*, 2022.
- *UB Teaching Innovation Award*, 2021.
- *UB SEAS Senior Faculty Teacher of the Year* award, 2020.
- *UB CSE Senior Researcher award*, 2018.
- *UB SEAS Senior Researcher of the Year* award, 2017.
- *SIGMOD research highlights*, 2016.
- *Best Paper award* at the 35th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS), 2016.
- *UB CSE Service award*, 2016.
- *UB SEAS Senior Faculty Teacher of the Year* award, 2015.
- *IBM Faculty Award*, 2013.
- *Best Paper award* at the 31st ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS), 2012.
- *UB Exceptional Scholars - Young Investigator award*, 2011.
- *Best Paper award* at the 18th Annual European Symposium on Algorithms (ESA), 2010.
- *HP Labs Open Innovation Award*, 2010.
- *NSF CAREER Award*, 2009.
- *William Chan Memorial Dissertation Award*, 2007.
  Awarded annually to the best doctoral thesis from the department of Computer Science and Engineering at the University of Washington.

- *Best Student Paper award* at the 1st Workshop on Internet and Network Economics, 2005.
- *Dean's Excellence Award from the College of Natural Science*, The University of Texas at Austin, 2002–2003.
- *IBM First Patent Application Invention Achievement Award*, 2001.

4 Honors

- Faculty Fellow, UB Honors College, 2019-20.
- Invited to present *Open lectures for PhD students in computer science* at the University of Warsaw, May 2018.
- Invited as a plenary speaker at STOC 2017 Theory Fest to present the PODS 2016 paper.
- The PODS 16 paper was invited to the SIGMOD Research Highlights section of the March 2017 issue of SIGMOD RECORD.
- The PODS 12 paper titled "Worst-case optimal join algorithms" was invited to the Database Principles Column of SIGMOD Record. This column publishes invited surveys which present recent developments in the theoretical community to the larger database community.
- The STOC 2006 paper titled "Explicit Capacity-Achieving List-Decodable Code" was invited to the Research Highlights section of the *Communications of the ACM*. The Communications of the ACM has a readership of 80,000 and the Research Highlights section is devoted to the most important research results published in Computer Science in recent years. The article was published in the March 2009 edition of the Communication of the ACM.
- The STOC 2006 paper titled "Explicit Capacity-Achieving List-Decodable Code" was highlighted, along with two other papers, *in a news release for STOC 2006* and in the *ACM SIGACT annual report for 2006*.

5 Professional Memberships and Activities

5.1 Journal Editorship

- Editor, Theory of Computing Systems, 2015– present.
- Asociate Editor, IEEE Transactions on Information theory, 2016– 2019.
- Guest Co-editor, *APPROX/RANDOM 12 special issue* in *Theory of Computing* journal.

5.2 Other Editorial Positions

- Co-editor, Teaching Responsible Computing Playbook (online).

5.3 Workshop Organization

- Co-organizer, *Multiple Approaches for Teaching Responsible Computing*, at SIGCSE 2025.
- Co-organizer, *Algorithmic Opportunities in the Modern LLM Revolution*, at STOC 2024.
- Co-organizer, *Simons Workshop on Fined-Grained Complexity, Logic, and Query Evaluation*, 2023.
- Co-organizer, *ICERM topical workshop on Algorithmic Coding Theory*, 2016.
- Co-organizer, *The Eastern Great Lakes (EaGL) Theory Workshop*.
  This is a regional workshop for researchers in theory of computation within a few hours driving distance to Buffalo. The workshop had about 300 attendees in five workshops from 2008-2012. We also received funding from NSF for the 2009, 2010 and 2011 EaGL workshops. For more details, please visit the 2012 workshop webpage `http://www.cse.buffalo.edu/events/theory-V/`.
- Co-organizer, *Coding, Complexity and Sparsity Workshop*, Ann Arbor, MI, 2011, 2012 and 2013. For more details, see `http://eecs.umich.edu/eecs/SPARC2013/index.php`.
- Organization Committee Chair, *The 15th International Computing and Combinatorics Conference (COCOON)*, Niagara Falls, July 2009.
  The webpage for COCOON 2009 is here: `http://www.cse.buffalo.edu/cocoon2009/`.

5.4 Program Committee Membership

(Only Program Committee listed where the participation is at the level of area chair.)

- Program Committee Member, *43rd Principles of Database Systems (PODS)*, 2024.
- Program Committee Member, *42nd Principles of Database Systems (PODS)*, 2023.
- Program Committee Member, *41st Principles of Database Systems (PODS)*, 2022.
- Program Committee Member, *24th International Conference on Database Theory (ICDT)*, 2021.
- Program Committee Member, *39th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 2019.
- Program Committee Member, *30th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2019.
- Program Committee Member, *22nd International Conference on Randomization and Computation (RANDOM)*, 2018.
- Program Committee Member, *9th Innovations in Theoretical Computer Science (ITCS)*, 2018.
- Program Committee Member, *10th annual conference on Theory and Applications of Models of Computation (TAMC)*, 2013.
- Program Committee Member, *4th Innovations in Theoretical Computer Science (ITCS)*, 2013.
- Program Committee Member, *19th Computing: the Australasian Theory Symposium (CATS)*, 2013.

- Program Committee Member, *16th International Workshop on Randomization and Computation (RANDOM)*, 2012.
- Program Committee Member, *ICALP 2011 Group Testing Workshop*, 2011.
- Program Committee Member, *14th International Workshop on Randomization and Computation (RANDOM)*, 2010.

5.5 Other Activities

- Co-chair, Social Impacts working group, SUNY STRIVE Research Group in AI, 2023-24.
- Judge, 2023 United States Responsible Computing Challenge, Mozilla Foundation.
- Member, Algorithm and Complexity (AL) Knowledge Area for the ACM/IEEE CS202X task force on computer science curriculum.
- Member, Association of Computing Machinery (ACM).
- Invited Seminar participant, *Workshop on Coding and Information Theory*, CSMA, Harvard, April 2018; *Workshop on Information Theory in Complexity Theory and Combinatorics*, Simons Institute for the Theory of Computing, Berkeley, 2015; *Algebraic Methods in Computational Complexity*, Schloss Dagstuhl, Germany, October 2009, October 2012 and September 2014; *Workshop on Aspects of Coding Theory*, EPFL, Switzerland, 2011; *Group Testing Designs, Algorithms, and Applications to Biology*, IMA, Minneapolis, 2012; *Workshop on Algorithms for Data Streams*, TU-Dortmund, Dortmund, Germany, July 2012; *Search Methodologies III*, Bielefeld, Germany, September, 2012.
- Panelist, *NSF CCF*, 2009, 2010, 2011, 2012, 2014, 2017, 2018.
- Panelist, *NSF CISE Expeditions Reverse Site Visit*, 2013.

6 College or Professional School Service

- Member, Task Force on Generative AI in Teaching and Learning at UB, 2023-24.
- Member, Honors Council, UB Honors College, Fall 2022– present.
- Co-chair, SEAS JEDI for Faculty Mentoring Subcommittee, Spring 2023– present.
- Member, Committee on the Future of Computer Science and Computing, Spring 2022– Spring 2023.
- Reviewer, *IMPACT Data Enabled Sciences Panel*, January 2016.
- Reviewer, *UB2020 Scholars Fund*, April 2009.

7 Departmental Service

- Department of CSE, University at Buffalo
  - Faculty mentor, UB DivTech — Fall 2017 – present
  - Faculty mentor, Society and Computing (SoCo) — Spring 2021 – present
  - Associate Chair — July 2017– June 2018, April 2022– January 2023
  - Co-Chair, Ladder Faculty Hiring Committee — Fall 2024 – Spring 2025
  - Chair, Undergraduate Affairs Committee — July 2015– June 2017
    Member, Undergraduate Affairs Committee — Fall 2010– Spring 2020, Spring 2021– present
    Acting Chair — Spring, Summer 2013
  - Chair, CSE Distinguished Speaker Series Committee — Fall 2021– present
  - Chair, CSE Teaching Effectiveness Committee — Fall 2022– present
  - Member, Diversity Committee — Fall 2015– Spring 2020
  - Member, Graduate Admissions Committee — Fall 2007– Spring 2015
  - Member, Graduate Affairs Committee — Fall 2007– Spring 2010
    Chair, Theory sub-committee
  - Chair, Distinguished Speaker Series Committee — Fall 2020– present
  - Member, Colloquium Committee — Fall 2007– Spring 2010
    Chair, Colloquium Committee — Fall 2009– Spring 2010
- Department of CSE, University at Washington
  - Member, Graduate Admissions Committee — 2006–2007

8 Courses Taught

- Department of CSE, University at Buffalo
  - CSE 445/545: Coding Theory — Spring 2025
  - CSE 440/441/540: Machine Learning and Society — Spring 2025
  - CSE 331: Algorithms and Complexity — Fall 2024
  - CSE 440/441/540: Machine Learning and Society — Spring 2024
  - CSE 331: Algorithms and Complexity — Fall 2023
  - CSE 199: First Year Seminar — Fall 2023
  - CSE 445/545: Coding Theory — Spring 2023
  - CSE 440/441/540: Machine Learning and Society — Spring 2023
  - CSE 331: Algorithms and Complexity — Fall 2022
  - CSE 445/545: Coding Theory — Spring 2022
  - CSE 440/441/540: Machine Learning and Society — Spring 2022

- CSE 331: Algorithms and Complexity — Fall 2021
- CSE 410: The Algorithms Have Arrived. What's Next? — Spring 2020
- HON 214: The Good, Bad and Ugly of Computing — Fall 2019
- CSE 331: Algorithms and Complexity — Fall 2019
- CSE 445/545: Coding Theory — Spring 2019
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2018
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2018
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2017
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2017
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2016
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2016
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2015
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2015
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2014
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2014
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2013
- CSE 501: Introduction to Graduate Study in Computer Science & Engineering — Fall 2013
  Co-taught with Alan Selman.
- CSE 545: Error Correcting Codes: Combinatorics, Algorithms and Applications — Spring 2013
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2012
- CSE 545: Error Correcting Codes: Combinatorics, Algorithms and Applications — Spring 2012
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2011
- CSE 709: Group Testing and Compressed Sensing — Fall 2011
  Co-taught with Hung Ngo.
- CSE 736: Online Learning — Spring 2011
  Co-taught with Hung Ngo.
- CSE 545: Error Correcting Codes: Combinatorics, Algorithms and Applications — Spring 2011
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2010
- CSE 545: Error Correcting Codes: Combinatorics, Algorithms and Applications — Spring 2010
- CSE 331: Introduction to Algorithm Analysis and Design — Fall 2009
- CSE 704: LP/SDP-based Approximation Algorithms — Fall 2009
  Co-taught with Hung Ngo.
- CSE 545: Error Correcting Codes: Combinatorics, Algorithms and Applications — Spring 2009
- CSE 725: Expanders, Property Testing and the PCP Theorem - II — Spring 2009
  Co-taught with Hung Ngo.
- CSE 704: Expanders, Property Testing and the PCP Theorem - I — Fall 2008
  Co-taught with Hung Ngo.

  - CSE 728: Seminar on Data Streams — Spring 2008
    Co-taught with Hung Ngo.
  - CSE 510C: Error Correcting Codes: Combinatorics, Algorithms and Applications — Fall 2007

- Department of CSE, University at Washington
  - CSE 322: Introduction to Formal Models in Computer Science — Spring 2006

9 Research Supervision

9.1 Students Supervised as Major Professor

1. Jimmy Dobler (Ph.D.) — Fall 2012– Summer 2018
   (1^{st} Employer: Yieldbook)
2. Jessica Grogan (Ph. D.) — Fall 2021– present
3. Jesse Hartloff (Ph. D.) — Fall 2011– Summer 2015
   (1^{st} Employer: University at Buffalo)
4. Isys Johnson (Ph.D.) (**NSF graduate research fellow**) — Fall 2020– present
5. Sai V. Mani Jayaraman (Ph.D.) — Fall 2015– Summer 2020
   (1^{st} Employer: Amazon)
6. Swapnoneel Roy (Ph.D.) — Fall 2008– Summer 2013
   (1^{st} Employer: University of North Florida)
7. Steve Uurtamo (Ph.D.) — Fall 2008– Fall 2012
   (1^{st} Employer: Groupon)
8. Dylan Zinsley (Ph. D.) — Spring 2024– present

9.2 Volunteer Researcher

1. Aarthy Shivram Arun — Fall 2015– Spring 2018

9.3 Independent Study

1. Krishna Ramkumar (M.S.) — Spring 2010

9.4 Undergraduate Research Advising

1. Yazgi Akata (B.S., UG RA) — Spring 2025– present
2. Oluwayemisi Babalola (B.S., C-STEP intern) — Summer 2024
3. Max Bileschi (B.S., Summer RA) — Summer 2012
4. Amit Blonder (B.S.) — Spring 2019– Summer 2019

5. Andrew Brigman (B.S., Summer RA) — Spring 2024– Spring 2025
6. Adhish Chugh (B.S., Summer RA) — Spring 2016– Fall 2017
7. Jen Cordaro (B.S., Summer RA) — 2013, Spring 2014
8. Jimmy Dobler (B.S., Senior Scholar) — Spring 2012
9. Matthew Eichhorn (B.S., UG RA) — Summer 2018– Summer 2019
10. Thomas Effland (B.S., URGE to Compute, UG RA) — 2013, Spring 2014
11. Shreya Gupta (B.S.) — Spring 2025– present
12. Jesse Hartloff (B.S., Senior Scholar, McNair Scholar) — Spring 2011, Summer 2011
13. Elliott King (B.S.) — Spring 2016
14. Alexander Liu (B.S., UG RA) — Summer 2020– Spring 2021
15. Matthew Morse (B.S., UG RA) — Spring 2014
16. Liam Orr (B.S., UG RA) — Summer 2020– Fall 2020
17. Aniruddh Rao (B.S.) — Summer 2020– Summer 2021
18. Kevin Rathbun (B.S.) — Spring 2017– Fall 2017
19. Mariel Schneggenburger (B.S., URGE to Compute) — 2013
20. Jim Schuler (B.S., URGE to Compute, UG RA) — 2013, Spring 2014
21. Harshini Subbiah (B.S., UG RA) — Spring 2025– present
22. Aman Timalsina (B.S.) — Spring 2022– Summer 2022
23. Zhenkang Yang (B.S.) — Spring 2017– Fall 2017
24. Dylan Zinsley (B.S., UG RA) — Spring 2023– Fall 2023

10 Grant Support

10.1 Current Grants

Title: Collaborative Research: Hardware-Aware Matrix Computations for Deep Learning Applications
Agency: NSF
Role: Lead PI
Collaborators: Christopher Ré, Stanford University (PI)
Effective Dates: 05/23–04/26
Amount: $376,964 (UB's share), $600,000 (total)
Credit: 100% (of UB's share)

Title: III: Medium: Collaborative Research: U4U -:
Taming Uncertainty with Uncertainty-Annotated Databases
Agency: NSF
Role: co-PI
Collaborators: Oliver Kennedy, CSE (PI)
Effective Dates: 10/20–09/24
Amount: $532,923 (UB's share)
Credit: 50% (of UB's share)

10.2 Previous Grants

Title: FAI: Building a Fair Recommender System for
Foster Care Services within the Constraints of a Sociotechnical System
Agency: NSF/Amazon
Role: co-PI
Collaborators: Varun Chandola, CSE (co-PI), Huei-Yen Chen, ISE (co-PI),
Kenneth Joseph, CSE (PI) and Melanie Sage, Social Work (co-PI)
Effective Dates: 01/20–31/22
Amount: $800,000
Credit: 15%

Title: Teaching Responsible Computing
Agency: Mozilla Foundation
Role: PI
Collaborators: Varun Chandola, CSE (co-PI), Adrienne Decker, Engineering Education (co-PI),
Matthew Hertz, CSE (co-PI),Andrew Hughes, CSE (co-PI),
Lindsay Hunter, Dance and Theater (co-PI), Kenneth Joseph, CSE (co-PI),
Dalia Muller, History (co-PI), Maria Rodriguez, Social Work (co-PI)
Kris Schindler, CSE (co-PI), Melanie Sage, Social Work (co-PI),
Sama Waham, Media Study (co-PI), Mark Shepard, Architecture and Media Study (co-PI),
and Jennifer Winikus, CSE (co-PI)
Effective Dates: 06/21–07/22
Amount: $54,000
Credit: 9%

Title: AF: Medium: Collaborative Research: Beyond Sparsity:
Refined Measures of Complexity for Linear Algebra
Agency: NSF
Role: Lead PI
Collaborators: Christopher Ré, Stanford University (PI)
Effective Dates: 03/18–02/23
Amount: $469,428 (UB's share), $1.02M (total)
Credit: 100% (of UB's share)

Title: AF:Small:Tight Topology Dependent bounds on Distributed Communication
Agency: NSF
Role: PI
Collaborators: Mike Langberg, EE (co-PI) and Shi Li, CSE (co-PI)
Effective Dates: 09/17–08/21
Amount: $450,000
Credit: 34%

Title: Ethics in CS Education as a first principle
and not an afterthought
Agency: Mozilla Foundation
Role: PI
Collaborators: Matthew Bolton, ISE (co-PI), Varun Chandola, CSE (co-PI), Kenneth Joseph, CSE (co-PI), Jesse Hartloff, CSE (co-PI), Matthew Hertz, CSE (co-PI), Steven Ko, CSE (co-PI), Jonathan Manes, Law School (co-PI), Mark Shepard, Architecture and Media Study (co-PI), and Jennifer Winikus, CSE (co-PI)
Effective Dates: 04/19–05/21
Amount: $150,000
Credit: 15.4%

Title: Ethical AI
Agency: Germination Space program funding (UB)
Role: co-PI
Collaborators: Matthew Bolton, ISE (co-PI), Varun Chandola, CSE (PI), Kenneth Joseph, CSE (co-PI), Jonathan Manes, Law School (co-PI), and Mark Shepard, Architecture and Media Study (co-PI)
Effective Dates: 12/17–06/21
Amount: $20,000
Credit: 16.67%

Title: CSE4All: Computer Science and Engineering for All
Agency: President's Circle Funding (UB)
Role: co-PI
Collaborators: Carl Alphonce, CSE (co-PI), Kris Schindler, CSE (PI), Jennifer Winikus, CSE (PI) and Lukasz Ziarek, CSE (co-PI)
Effective Dates: 12/17–08/18
Amount: $30,000
Credit: 20%

Title: IBM Faculty Award
Agency: IBM
Role: PI
Effective Dates: 09/13–08/14
Amount: $20,000
Credit: 100%

Title: AF:III:Small:Collaborative Research: New Frontiers in Join Algorithms: Optimality, Noise, and Richer Languages
Agency: NSF
Role: PI (co-PI till Summer 2016)
Collaborators: Hung Ngo, CSE (lead-PI till Summer 2016); Christopher Ré, Stanford University (PI)
Effective Dates: 08/13–07/17
Amount: $326,101 (UB's share), $500,000 (total)
Credit: 50% (of UB's share)

Title: AF: Medium: Collaborative Research: Sparse Approximation: Theory and Extensions
Agency: NSF
Role: PI
Collaborators: Anna Gilbert, University of Michigan (lead-PI); Hung Ngo, CSE (co-PI); S. Muthukrishnan, Rutgers University (PI); Martin Strauss, University of Michigan (co-PI)
Effective Dates: 07/12–06/16
Amount: $305,467 (UB's share), $1.2M (total)
Credit: 50% (of UB's share)

Title: TC: Small: Integrating Privacy Preserving Biometric Templates and Efficient Indexing Methods
Agency: NSF
Role: co-PI
Collaborators: Venu Govindarjau, CSE (PI)
Effective Dates: 09/11–08/15
Amount: $514,788
Credit: 50%

Title: CAREER: Efficient Computation of Approximate Solutions
Agency: NSF
Role: PI
Effective Dates: 02/09–01/15
Amount: $449,807
Credit: 100%

Title: Matching Methods for Privacy Preserving Indexed Fingerprint Templates
Agency: Center for Identification Technology (CITeR)
Role: co-PI
Collaborators: Venu Govindarjau, CSE (PI)
Effective Dates: 06/13–05/14
Amount: $50,000
Credit: 50%

Title: Unrestricted gift from LogicBlox
Agency: LogicBlox
Role: PI
Collaborators: Hung Ngo, CSE (PI)
Effective Dates: 09/12–07/13
Amount: $35,000
Credit: 50%

Title: Optimization Problems in Data Deduplication and New Coding Techniques for Storage Systems
Agency: HP Labs Open Innovation Award
Role: PI
Effective Dates: 08/10–07/12
Amount: $52,000
Credit: 100%

Title: Use of Cellphone Based Time Activity Data for Air Pollutant Exposure Estimation
Agency: NIH (R21)
Role: Co-I
Collaborators: Murat Demirbas, CSE (Co-I); Carole B. Rudra, Social and Preventive Medicine (PI); Adam Szpiro, University of Washington (Co-I); Enki Yoo, Geography (Co-I)
Effective Dates: 09/10–07/12
Amount: $494,484
Credit: 20%

Title: Eastern Great Lakes Theory of Computation Workshop
Agency: NSF
Role: PI
Effective Dates: 09/09–08/12
Amount: $11,300
Credit: 100%

11 Publications

11.1 Articles

(In theoretical computer science papers, the author names are ordered alphabetically.)

(∗ denotes supervised UB student author at the time of writing the paper.)

(† denotes equal contribution in case author names are ordered by contribution.)

11.1.1 Book Chapters

[B1] H. Q. Ngo and A. Rudra. Efficient decodable group testing. In *Encyclopedia of Algorithms*. 2015.

[B2] A. Rudra. Algorithmic coding theory. In M. Atallah and M. Blanton, editors, *Handbook of Algorithms and Theory of Computation*. CRC Press, 2009.

[B3] A. Rudra. List decoding near capacity: Folded RS codes. In M.-Y. Kao, editor, *Encyclopedia of Algorithms*. Springer, 2008.

11.1.2 Invited Articles

[I1] A. Rudra. Technical perspective: (pre-) semirings come to the recursion party. *SIGMOD Rec.*, 52(1):74, 2023.

[I2] A. Rudra. Answering FAQs in CSPs, probabilistic graphical models, databases, logic and matrix operations (invited talk). In *Proceedings of the 49th Annual ACM SIGACT Symposium on Theory of Computing, STOC 2017, Montreal, QC, Canada, June 19-23, 2017*, page 4, 2017.

[I3] M. Abo Khamis, H. Q. Ngo, and A. Rudra. Juggling functions inside a database. *SIGMOD Record*, pages 6–13, March 2017. Special Issue on 2016 ACM SIGMOD Research Highlights.

[I4] H. Q. Ngo, C. Ré, and A. Rudra. Skew strikes back: new developments in the theory of join algorithms. *SIGMOD Record*, 42(4):5–16, 2013.

[I5] V. Guruswami and A. Rudra. Error correction up to the information-theoretic limit. *Commun. ACM*, 52(3):87–95, 2009.

[I6] A. Rudra. Efficient list decoding of explicit codes with optimal redundancy. In *Proceedings of the 17th International Symposium on Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC)*, pages 38–46, 2007.

[I7] V. Guruswami and A. Rudra. Achieving list decoding capacity using folded Reed-Solomon codes. In *Proceedings of the 44th Annual Allerton Conference on Communications, Control and Computing*, 2006.

11.1.3 Refereed Journals

[J1] A. Rudra. Arithmetic circuits, structured matrices and (not so) deep learning. *Theory Comput. Syst.*, 67(3):592–626, 2023.

[J2] K. Joseph, H. W. Chen, S. Ionescu, Y. Du, P. Sankhe, A. Hannak, and A. Rudra. A qualitative, network-centric method for modeling socio-technical systems, with applications to evaluating interventions on social media platforms to increase social equality. *Appl. Netw. Sci.*, 7(1):49, 2022.

[J3] J. Blasiok, V. Guruswami, P. Nakkiran, A. Rudra, and M. Sudan. General strong polarization. *J. ACM*, 69(2):11:1–11:67, 2022.

[J4] H. Q. Ngo, E. Porat, C. Ré, and A. Rudra. Worst-case optimal join algorithms. *J. ACM*, 65(3):16:1–16:40, 2018.

[J5] M. Abo Khamis*, H. Q. Ngo, C. Ré, and A. Rudra. Joins via geometric resolutions: Worst case and beyond. *ACM Trans. Database Syst.*, 41(4):22:1–22:45, 2016.

[J6] M. L. Glasgow*, C. B. Rudra, E. H. Yoo, M. Demirbas, J. Merriman, P. Nayak*, C. Crabtree-Ide*, A. A. Szpiro, A. Rudra, J. Wactawski-Wende, and L. Mu. Using smartphones to collect time-activity data for long-term personal-level air pollution exposure assessment. *J Expo Sci Environ Epidemiol*, 26(4):356–364, Jun 2016.

[J7] M. I. Husain*, S. Y. Ko, S. Uurtamo*, A. Rudra, and R. Sridhar. Bidirectional data verification for cloud storage. *J. Network and Computer Applications*, 45:96–107, 2014.

[J8] N. Chen, R. Engelberg, C. T. Nguyen, P. Raghavendra, A. Rudra, and G. Singh. Improved approximation algorithms for the spanning star forest problem. *Algorithmica*, 65(3):498–516, 2012.

[J9] N. Bansal, A. Gupta, J. Li, J. Mestre, V. Nagarajan, and A. Rudra. When LP is the cure for your matching woes: Improved bounds for stochastic matchings. *Algorithmica*, 63(4):733–762, 2012. Special Issue for ESA 2010.

[J10] A. Rudra. Limits to list decoding of random codes. *IEEE Transactions on Information Theory*, 57(3):1398–1408, 2011.

[J11] X. Li, A. Rudra, and R. Swaminathan. Flexible coloring. *Information Processing Letters*, 111(11):538–540, 2011.

[J12] V. Guruswami and A. Rudra. Soft decoding, dual BCH codes, and better list-decodable ϵ-biased codes. *IEEE Transactions on Information Theory*, 57(2):705–717, 2011. Special Issue on Koetter Vardy.

[J13] R. Krauthgamer, A. Mehta, and A. Rudra. Pricing commodities. *Theoretical Computer Science (Special Issue on WAOA 2007)*, 412(7):602–613, 2011.

[J14] V. Guruswami and A. Rudra. Concatenated codes can achieve list-decoding capacity. *IEEE Transactions on Information Theory*, 65(10):5195 – 5206, 2010.

[J15] D. Coppersmith, L. Fleischer, and A. Rudra. Ordering by weighted number of wins gives a good ranking for weighted tournaments. *ACM Transactions on Algorithms*, 6(3), 2010.

[J16] N. Bansal, N. Chen, N. Cherniavsky, A. Rudra, B. Schieber, and M. Sviridenko. Dynamic pricing for impatient bidders. *ACM Transactions on Algorithms*, 6(2), 2010.

[J17] M. Cary, A. Rudra, A. Sabharwal, and E. Vee. Floodlight illumination of inifite wedges. *Computational Geometry*, 43(1):23–34, 2010. Special Issue on the 14th Annual Fall Workshop on Computational Geometry 2007.

[J18] V. Guruswami and A. Rudra. Better binary list decodable codes via multilevel concatenation. *IEEE Transactions on Information Theory*, 55(1):19–26, 2009.

[J19] C. S. Jutla, A. C. Patthak, A. Rudra, and D. Zuckerman. Testing low-degree polynomials over prime fields. *Random Structures and Algorithms*, 35(2):163–193, 2009.

[J20] V. Guruswami and A. Rudra. Explicit codes achieving list decoding capacity: Error-correction with optimal redundancy. *IEEE Transactions on Information Theory*, 54(1):135–150, 2008.

[J21] N. Chen and A. Rudra. Walrasian equilibrium: Hardness, approximations and tractable instances. *Algorithmica*, 52(1):44–64, 2008. Special Issue for WINE 2005.

[J22] V. Guruswami and A. Rudra. Limits to list decoding Reed-Solomon codes. *IEEE Transactions on Information Theory*, 52(8):3642–3649, 2006.

[J23] A. Blum, V. Kumar, A. Rudra, and F. Wu. Online learning in online auctions. *Theoretical Computer Science*, 324(2-3):137–146, 2004. Special Issue on Online Algorithms.

11.1.4 Refereed Conference Proceedings

[C1] A. Huber*, O. Kennedy, A. Rudra, Z. Zhao, S. Feng, and B. Glavic. Fastpdb: Towards bag-probabilistic queries at interactive speeds. *Proc. ACM Manag. Data*, 3(1):41:1–41:25, 2025. *SIGMOD 2025 paper*.

[C2] J. W. Liu†, J. Grogan†,*, O. M. Dugan, A. Rao, S. Arora, A. Rudra, and C. Ré. Towards learning high-precision least squares algorithms with sequence models. In *The Thirteenth International Conference on Learning Representations, ICLR 2025, Singapore, April 24-28, 2025*. OpenReview.net, 2025. Acceptance Rate: 31.75%.

[C3] S. Arora, S. Eyuboglu, M. Zhang, A. Timalsina, S. Alberti, D. Zinsley*, J. Zou, A. Rudra, and C. Ré. Simple linear attention language models balance the recall-throughput tradeoff. In *Proceedings of the 41st International Conference on Machine Learning (ICML)*, volume abs/2402.18668, 2024. Spotlight presentation. Acceptance Rate: 3.53% (for spotlight presentations).

[C4] S. Arora, S. Eyuboglu, A. Timalsina, I. Johnson*, M. Poli, J. Zou, A. Rudra, and C. Ré. Zoology: Measuring and improving recall in efficient language models. In *Proceedings of 12th International Conference on Learning Representations (ICLR)*, volume abs/2312.04927, 2024. Acceptance Rate: 30.81%.

[C5] D. Y. Fu, S. Arora†, J. Grogan†,*, I. Johnson†,*, E. S. Eyuboglu†, A. W. Thomas†, B. Spector, M. Poli, A. Rudra, and C. Ré. Monarch mixer: A simple sub-quadratic gemm-based architecture. In A. Oh, T. Naumann, A. Globerson, K. Saenko, M. Hardt, and S. Levine, editors, *Advances in Neural Information Processing Systems 36: Annual Conference on Neural Information Processing Systems 2023, NeurIPS 2023, New Orleans, LA, USA, December 10 - 16, 2023*, 2023. Oral presentation. Acceptance Rate: 0.54% (for oral presentations).

[C6] S. Massaroli, M. Poli, D. Y. Fu, H. Kumbong, R. N. Parnichkun, D. W. Romero, A. Timalsina, Q. McIntyre, B. Chen, A. Rudra, C. Zhang, C. Ré, S. Ermon, and Y. Bengio. Laughing hyena distillery: Extracting compact recurrences from convolutions. In A. Oh, T. Naumann, A. Globerson, K. Saenko, M. Hardt, and S. Levine, editors, *Advances in Neural Information Processing Systems 36: Annual Conference on Neural Information Processing Systems 2023, NeurIPS 2023, New Orleans, LA, USA, December 10 - 16, 2023*, 2023. Acceptance Rate: 26.1%.

[C7] D. Y. Fu, E. L. Epstein, E. Nguyen, A. W. Thomas, M. Zhang, T. Dao, A. Rudra, and C. Ré. Simple hardware-efficient long convolutions for sequence modeling. In *Proceedings of the 40th International Conference on Machine Learning (ICML)*, 2023. Acceptance Rate: 27.5%.

[C8] D. Y. Fu, T. Dao, K. K. Saab, A. W. Thomas, A. Rudra, and C. Ré. Hungry hungry hippos: Towards language modeling with state space models. In *The Eleventh International Conference on Learning Representations, ICLR 2023, Kigali, Rwanda, May 1-5, 2023*. OpenReview.net, 2023. Spotlight presentation. Acceptance Rate: 5.6% (for spotlight papers).

[C9] A. Gu[†], I. Johnson[†,*], A. Timalsina[*], A. Rudra, and C. Ré. How to train your HIPPO: state space models with generalized orthogonal basis projections. In *The Eleventh International Conference on Learning Representations, ICLR 2023, Kigali, Rwanda, May 1-5, 2023*. OpenReview.net, 2023. Acceptance Rate: 32%.

[C10] T. Dao, D. Y. Fu, S. Ermon, A. Rudra, and C. Ré. FlashAttention: Fast and memory-efficient exact attention with io-awareness. In *NeurIPS*, 2022. Acceptance Rate: 25.6%. Also **Best Paper Award** at Hardware Aware Efficient Training (HAET), Workshop at ICML 2022.

[C11] T. Dao, B. Chen, N. S. Sohoni, A. D. Desai, M. Poli, J. Grogan[*], A. Liu[*], A. Rao[*], A. Rudra, and C. Ré. Monarch: Expressive Structured Matrices for Efficient and Accurate Training. In *Proceedings of the 39th International Conference on Machine Learning (ICML)*, 2022. Long talk. **Outstanding Paper Runner Up.** Acceptance Rate: 2.1% (for long talks).

[C12] B. Chen, T. Dao, K. Liang, J. Yang, Z. Song, A. Rudra, and C. Ré. Pixelated Butterfly: Simple and Efficient Sparse training for Neural Network Models. In *Proceedings of International Conference on Learning Representations (ICLR)*, 2022. Spotlight presentation. Acceptance Rate: 3.8% (for spotlight papers).

[C13] A. Gu, I. Johnson[*], K. Goel, K. K. Saab, T. Dao, A. Rudra, and C. Ré. Combining Recurrent, Convolutional, and Continuous-time Models with Structured Learned Linear State-Space Layers. In *Advances in Neural Information Processing Systems 34: Annual Conference on Neural Information Processing Systems 2021, NeurIPS 2021*, 2021. Acceptance Rate: 26%.

[C14] B. Chen, T. Dao, E. Winsor, Z. Song, A. Rudra, and C. Ré. Scatterbrain: Unifying Sparse and Low-rank Attention. In *Advances in Neural Information Processing Systems 34: Annual Conference on Neural Information Processing Systems 2021, NeurIPS 2021*, 2021. Acceptance Rate: 26%.

[C15] A. Gu, T. Dao, S. Ermon, A. Rudra, and C. Ré. Hippo: Recurrent memory with optimal polynomial projections. In H. Larochelle, M. Ranzato, R. Hadsell, M. Balcan, and H. Lin, editors, *Advances in Neural Information Processing Systems 33: Annual Conference on Neural Information Processing Systems 2020, NeurIPS 2020, December 6-12, 2020, virtual*, 2020. Spotlight presentation. Acceptance Rate: 4.1% (for spotlight papers).

[C16] A. C. Gilbert, A. Gu, C. Ré, A. Rudra, and M. Wootters. Sparse recovery for orthogonal polynomial transforms. In A. Czumaj, A. Dawar, and E. Merelli, editors, *47th International Colloquium on Automata, Languages, and Programming, ICALP 2020, July 8-11, 2020, Saarbrücken, Germany (Virtual Conference)*, volume 168 of *LIPIcs*, pages 58:1–58:16. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2020. Acceptance Rate: 29.4%.

[C17] T. Dao, N. Sohoni, A. Gu, M. Eichhorn[*], A. Blonder[*], M. Leszczynski, A. Rudra, and C. Ré. Kaleidoscope: An Efficient, Learnable Representation For All Structured Linear Maps. In *Proceedings of International Conference on Learning Representations (ICLR)*, 2020. Spotlight presentation. Acceptance Rate: 4.1% (for spotlight papers).

[C18] T. Dao, A. Gu, M. Eichhorn[*], A. Rudra, and C. Ré. Learning Fast Algorithms for Linear Transforms Using Butterfly Factorizations. In *Proceedings of the Thirty-sixth International Conference on Machine Learning (ICML)*, 2019. Full Oral presentation. Acceptance Rate: 22.6%.

[C19] M. Langberg, S. Li, S. V. Mani Jayaraman*, and A. Rudra. Toplogy Dependent Bounds For Computing FAQs. In *Proceedings of* PODS 2019, 2019.

[C20] A. T. Thomas, A. Gu, T. Dao, A. Rudra, and C. Ré. Learning compressed transforms with low displacement rank. In *Advances in Neural Information Processing Systems 31: Annual Conference on Neural Information Processing Systems 2018, NeurIPS 2018, 3-8 December 2018, Montréal, Canada.*, pages 9066–9078, 2018. Acceptance Rate: 20.8%.

[C21] J. Blasiok, V. Guruswami, P. Nakkiran, A. Rudra, and M. Sudan. General strong polarization. In *Proceedings of the 50th Annual ACM SIGACT Symposium on Theory of Computing (STOC)*, pages 485–492, 2018. Acceptance Rate: 26.7%.

[C22] A. Rudra and M. Wootters. Average-radius list-recoverability of random linear codes. In *Proceedings of the Twenty-Ninth Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2018, New Orleans, LA, USA, January 7-10, 2018*, pages 644–662, 2018. Acceptance Rate: 32.9%.

[C23] C. D. Sa, A. Gu, R. Puttagunta, C. Ré, and A. Rudra. A two-pronged progress in structured dense matrix vector multiplication. In *Proceedings of the Twenty-Ninth Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2018, New Orleans, LA, USA, January 7-10, 2018*, pages 1060–1079, 2018. Acceptance Rate: 32.9%.

[C24] A. Chattopadhyay, M. Langberg, S. Li, and A. Rudra. Tight network topology dependent bounds on rounds of communication. In *Proceedings of the Twenty-Eighth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 2524–2539, 2017. Acceptance Rate: 34%.

[C25] M. Abo Khamis*, H. Q. Ngo, and A. Rudra. FAQ: Questions Asked Frequently. In *Proceedings of the 35th ACM Symposium on Principles of Database Systems (PODS)*, pages 13–28, 2016. **Best Paper Award**. Acceptance Rate: 33%.

[C26] A. Chattopadhyay and A. Rudra. The range of topological effects on communication. In *Proceedings of the 42nd International Colloquium on Automata, Languages, and Programming (ICALP), Track C*, pages 540–551, 2015. Acceptance Rate: 30.7%.

[C27] M. Abo Khamis*, H. Q. Ngo, C. Ré, and A. Rudra. Joins via geometric resolutions: Worst-case and beyond. In *Proceedings of the 34th ACM Symposium on Principles of Database Systems, PODS 2015, Melbourne, Victoria, Australia, May 31 - June 4, 2015*, pages 213–228, 2015. Acceptance Rate: 31%.

[C28] A. Rudra and M. Wootters. It'll probably work out: Improved list-decoding through random operations. In *Proceedings of the 2015 Conference on Innovations in Theoretical Computer Science, ITCS 2015, Rehovot, Israel, January 11-13, 2015*, pages 287–296, 2015. Acceptance Rate: 28.3%.

[C29] A. Chattopadhyay, J. Radhakrishnan, and A. Rudra. Topology matters in communication. In *55th IEEE Annual Symposium on Foundations of Computer Science, FOCS 2014, Philadelphia, PA, USA, October 18-21, 2014*, pages 631–640, 2014. Acceptance Rate: 24.9%.

[C30] S. Roy*, A. Rudra, and A. Verma. Energy aware algorithmic engineering. In *Proceedings of IEEE 22nd International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)*, pages 321–330, 2014. Acceptance Rate: 20%.

[C31] A. Rudra and M. Wootters. Every list-decodable code for high noise has abundant near-optimal rate puncturings. In *Proceedings of 46th ACM Symposium on Theory of Computing (STOC)*, pages 764–773, 2014. Acceptance Rate: 28.5%.

[C32] D. T. Nguyen, H. Q. Ngo, C. Ré, and A. Rudra. Beyond worst-case analysis for joins with minesweeper. In *Proceedings of the 33rd ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS)*, pages 234–245, 2014. Acceptance Rate: 33%.

[C33] T. Effland*, M. Schneggenburger*, J. Schuler*, B. Zhang, J. Hartloff*, J. Dobler*, S. Tulyakov, , A. Rudra, and V. Govindaraju. Secure fingerprint hashes using subsets of local structures. In *Proceedings of the SPIE (Conference on Biometric and Surveillance Technology for Human and Activity Identification XI)*, page 17 in total, 2014.

[C34] A. C. Gilbert, H. Q. Ngo, E. Porat, A. Rudra, and M. J. Strauss. ℓ_2/ℓ_2-foreach sparse recovery with low risk. In *Proceedings of the 40th International Colloquium on Automata, Languages, and Programming (ICALP)*, pages 461–472, 2013. Acceptance Rate: 29.4%.

[C35] J. Hartloff*, M. Bileschi*, S. Tulyakov, J. Dobler*, A. Rudra, and V. Govindaraju. Security analysis for fingerprint fuzzy vaults. In *Proceedings of the SPIE (Conference on Biometric and Surveillance Technology for Human and Activity Identification X)*, volume 8712, page 12 in total, 2013.

[C36] J. Hartloff*, J. Dobler*, S. Tulyakov, A. Rudra, and V. Govindaraju. Towards fingerprints as strings: Secure indexing for fingerprint matching. In *Proceedings of 6th IAPR International Conference on Biometrics (ICB)*, pages 1–6, June 2013. Acceptance Rate: 34%.

[C37] S. Roy*, A. Rudra, and A. Verma. An energy complexity model for algorithms. In *Proceedings of the 4th Innovations in Theoretical Computer Science (ITCS)*, pages 283–304, 2013. Acceptance Rate: 41.4%.

[C38] M. I. Husain*, S. Uurtamo*, S. Y. Ko, A. Rudra, and R. Sridhar. PGV: Pretty good verification of remote storage. In *Proceedings of the 31st International Symposium on Reliable Distributed Systems (SRDS)*, pages 390–395, 2012. Acceptance Rate: 41.2%.

[C39] H. Q. Ngo, E. Porat, C. Ré, and A. Rudra. Worst-case optimal join algorithms. In *Proceedings of the 31st ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS)*, pages 37–48, 2012. **Best Paper Award**. Acceptance Rate: 26%.

[C40] H. Q. Ngo, E. Porat, and A. Rudra. Efficiently decodable compressed sensing by list-recoverable codes and recursion. In *Proceedings of the 29th International Symposium on Theoretical Aspects of Computer Science (STACS)*, pages 230–241, 2012. Acceptance Rate: 19.8%.

[C41] R. J. Lipton, K. W. Regan, and A. Rudra. Symmetric functions capture general functions. In *Proceedings of the 36th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 436–447, 2011. Acceptance Rate: 37.2%.

[C42] H. Ngo, E. Porat, and A. Rudra. Efficiently decodable error-correcting list disjunct matrices and applications. In *Proceedings of the 38th International Colloquium on Automata, Languages and Programming (ICALP)*, pages 557–568, July 2011. Acceptance Rate: 27%.

[C43] M. Demirbas, H. Gunes*, S. Tasci*, and A. Rudra. Singlehop collaborative feedback primitives for threshold querying in wireless sensor networks. In *Proceedings of the 25th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, pages 322–333, 2011. Acceptance Rate: 19%.

[C44] A. McGregor, A. Rudra, and S. Uurtamo*. Polynomial fitting of data streams with applications to codeword testing. In *Proceedings of the 28th International Symposium on Theoretical Aspects of Computer Science (STACS)*, pages 428–439, March 2011. Acceptance Rate: 19.9%.

[C45] N. Bansal, A. Gupta, J. Li, J. Mestre, V. Nagarajan, and A. Rudra. When LP is the cure for your matching woes: Improved bounds for stochastic matchings. In *Proceedings of the 18th Annual European Symposium (ESA)*, pages 218–229, 2010. Co-winner of the **Best Paper Award**. Acceptance Rate: 27.2%.

[C46] A. Rudra and S. Uurtamo*. Data stream algorithms for codeword testing. In *Proceedings of the 37th International Colloquium on Automata, Languages and Programming (ICALP)*, pages 629–640, 2010. Acceptance Rate: 27%.

[C47] H. Q. Ngo, A. Rudra, A. N. Le*, and T.-N. T. Nguyen*. Analyzing nonblocking switching networks using linear programming (duality). In *Proceedings of the 29th IEEE Conference on Computer Communications (INFOCOM)*, pages 2696–2704, 2010. Acceptance Rate: 17.5%.

[C48] P. Indyk, H. Q. Ngo, and A. Rudra. Efficiently decodable non-adaptive group testing. In *Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1126–1142, 2010. Acceptance Rate: 30.3%.

[C49] A. Rudra. Limits to list decoding random codes. In *Proceedings of the 15th Annual International Conference on Computing and Combinatorics (COCOON)*, pages 27–36, 2009. Acceptance Rate: 40.8%.

[C50] N. Chen, N. Immorlica, A. R. Karlin, M. Mahdian, and A. Rudra. Approximating matches made in heaven. In *Proceedings of the 36th International Colloquium on Automata, Languages and Programming (ICALP)*, pages 266–278, 2009. Acceptance Rate: 27.8%.

[C51] V. Guruswami and A. Rudra. Soft decoding, dual BCH codes, and better list-decodable ϵ-biased codes. In *Proceedings of the 23rd Annual IEEE Conference on Computational Complexity (CCC)*, pages 163–174, 2008. Acceptance Rate: 36.8%.

[C52] R. Krauthgamer, A. Mehta, V. Raman, and A. Rudra. Greedy list intersection. In *Proceedings of the 24th International Conference on Data Engineering (ICDE)*, pages 1033–1042, 2008. Acceptance Rate: 19.3%.

[C53] V. Guruswami and A. Rudra. Concatenated codes can achieve list-decoding capacity. In *Proceedings of the Nineteenth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 258–267, 2008. Acceptance Rate: 29.7%.

[C54] P. Beame, T. S. Jayram, and A. Rudra. Lower bounds for randomized read/write stream algorithms. In *Proceedings of the 39th Annual ACM Symposium on Theory of Computing (STOC)*, pages 689–698, 2007. Acceptance Rate: 24.7%.

[C55] N. Bansal, N. Chen, N. Cherniavsky, A. Rudra, B. Schieber, and M. Sviridenko. Dynamic pricing for impatient bidders. In *Proceedings of the Eighteenth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 726–735, 2007. Acceptance Rate: 36.4%.

[C56] V. Guruswami and A. Rudra. Explicit capacity-achieving list-decodable codes. In *Proceedings of the 38th Annual ACM Symposium on Theory of Computing (STOC)*, pages 1–10, 2006. Acceptance Rate: 27.1%.

[C57] D. Coppersmith, L. Fleischer, and A. Rudra. Ordering by weighted number of wins gives a good ranking for weighted tournaments. In *Proceedings of the Seventeenth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 776–782, 2006. Acceptance Rate: 30.7%.

[C58] V. Kumar and A. Rudra. Approximation algorithms for wavelength assignment. In *Proceedings of the 25th International Conference on Foundations of Software Technology and Theoretical Computer Science (FST&TCS)*, pages 152–163, 2005. Acceptance Rate: 22.8%.

[C59] V. Guruswami and A. Rudra. Limits to list decoding reed-solomon codes. In *Proceedings of the 37th Annual ACM Symposium on Theory of Computing (STOC)*, pages 602–609, 2005. Acceptance Rate: 29%.

[C60] C. S. Jutla, A. C. Patthak, A. Rudra, and D. Zuckerman. Testing low-degree polynomials over prime fields. In *Proceedings of the 45th Symposium on Foundations of Computer Science (FOCS)*, pages 423–432, 2004. Acceptance Rate: 23.5%.

[C61] R. Garg, V. Kumar, A. Rudra, and A. Verma. Coalitional games on graphs: core structure, substitutes and frugality. In *Proceedings of the 4th ACM Conference on Electronic Commerce (EC)*, pages 248–249, 2003. Acceptance Rate: 19%.

[C62] R. Bhaskar, P. K. Dubey, V. Kumar, and A. Rudra. Efficient galois field arithmetic on simd architectures. In *Proceedings of the Fifteenth Annual ACM Symposium on Parallel Algorithms (SPAA)*, pages 256–257, 2003. Acceptance Rate: 36%.

[C63] A. Blum, V. Kumar, A. Rudra, and F. Wu. Online learning in online auctions. In *Proceedings of the 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 202–204, 2003. Acceptance Rate: 27.8%.

11.1.5 Refereed Workshop Proceedings

[W1] A. Shivram Arun, S. V. Mani Jayaraman*, C. Ré, and A. Rudra. Hypertree Decompositions Revisited for PGMs. In *Proceedings of Eighth International Workshop on Statistical Relational AI (StarAI)*, 2018.

[W2] A. T. Thomas, A. Gu, T. Dao, A. Rudra, and C. Ré. Learning invariance with compact transforms. In *Sixth International Conference on Learning Representations (ICLR) Workshop Track*, 2018.

[W3] J. Hartloff*, M. Morse*, B. Zhang, T. Effland*, J. Cordaro*, J. Schuler*, S. Tulyakov, A. Rudra, and V. Govindaraju. A multiple server scheme for fingerprint fuzzy vaults. In *Proceedings of CVPR Workshop on Biometrics*, 2015.

[W4] D. Nguyen*, M. Aref, M. Bravenboer, G. Kollias, H. Q. Ngo, C. Ré, and A. Rudra. Join processing for graph patterns: An old dog with new tricks. In *Proceedings of GRADES 2015 (co-located with SIGMOD/PODS 2015)*, 2015.

[W5] M. Morse*, J. Hartloff*, T. Effland*, J. Schuler*, J. Cordaro*, S. Tulyakov, , A. Rudra, and V. Govindaraju. Secure fingerprint matching with generic local structures. In *CVPR 2014 Biometrics Workshop*, 2014.

[W6] D. Duma, M. Wootters, A. C. Gilbert, H. Q. Ngo, A. Rudra, M. Alpert, T. J. Close, G. Ciardo, and S. Lonardi. Accurate decoding of pooled sequenced data using compressed sensing. In *WABI*, pages 70–84, 2013.

[W7] A. Rudra and S. Uurtamo*. Two theorems on list decoding. In *Proceedings of the 14th Intl. Workshop on Randomization and Computation (RANDOM)*, pages 696–709, 2010.

[W8] J. Aspnes, E. Blais, M. Demirbas, R. O'Donnell, A. Rudra, and S. Uurtamo*. k^+ decision trees. In *Proceedings of the 6th International Workshop on Algorithms for Sensor Systems, Wireless Ad Hoc Networks, and Autonomous Mobile Entities (ALGOSENSORS)*, pages 74–88, 2010.

[W9] N. Chen, R. Engelberg, C. T. Nguyen, P. Raghavendra, A. Rudra, and G. Singh. Improved approximation algorithms for the spanning star forest problem. In *Proceedings of the 10th Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)*, pages 44–58, 2007.

[W10] V. Guruswami and A. Rudra. Better binary list-decodable codes via multilevel concatenation. In *Proceedings of the 11th International Workshop on Randomization and Computation (RANDOM)*, pages 554–568, 2007.

[W11] R. Krauthgamer, A. Mehta, and A. Rudra. Pricing commodities, or how to sell when buyers have restricted valuations. In *Proceedings of the 5th International Workshop on Approximation and Online Algorithms (WAOA)*, pages 1–14, 2007.

[W12] N. Chen and A. Rudra. Walrasian equilibrium: Hardness, approximations and tractable instances. In *Proceedings of the 1st International Workshop on Internet and Network Economics (WINE)*, pages 141–150, 2005. Winner of the **Best Student Paper Award**.

[W13] V. Guruswami and A. Rudra. Tolerant locally testable codes. In *Proceedings of the 9th International Workshop on Randomization and Computation (RANDOM)*, pages 306–317, 2005.

[W14] A. Rudra, P. K. Dubey, C. S. Jutla, V. Kumar, J. R. Rao, and P. Rohatgi. Efficient rijndael encryption implementation with composite field arithmetic. In *Proceedings of the 3rd International Workshop on Cryptographic Hardware and Embedded Systems (CHES)*, pages 171–184, 2001.

11.1.6 Un-Refereed Proceedings

[U1] M. Sage, A. Rudra, K. Joseph, H.-Y. Chen, and V. Chandola. Transformative social innovation as a lens for ml for good, October 2020. *Not Peer-reviewed.*

11.2 Book (Under Preparation)

[B1] V. Guruswami, A. Rudra, and M. Sudan. Essential coding theory, 2020. Under preparation. Current version here: `http://www.cse.buffalo.edu/faculty/atri/courses/coding-theory/book/index.html`.

11.3 Patents

[P1] R. Krauthgamer, A. Mehta, V. Raman and A. Rudra. Adaptive greedy method for ordering intersecting of a group of lists into a left-deep AND-tree. *US Patent No. 7,925,604.* April 2011.

[P2] P. K. Dubey, C. Jutla, J. R. Rao, P. Rohatgi, A. Rudra and V. Kumar. Processing Galois Field arithmetic. *US Patent No. 6,766,344.* July 2004.

11.4 Talks

11.4.1 Invited Talks

1. Algebraic Coding and Cryptography Seminar Series, virtual, “Abstracting away the Deep Learning Mumbo-Jumbo (with Arithmetic Circuits)." April 2025.
2. Workshop on Theoretical Perspectives on LLMs, EnCORE Institute, UCSD. “An Arithmetic Circuit Lens on Deep Learning Architectures." March 2025.
3. Theory group meeting, Microsoft Research Redmond, virtual, “Who Needs Attention When You Have Structure?" April 2023.
4. Embedded Ethics Conference, Stanford University, ‘The "Buy-In"’ (Panelist). March 2023.
5. Data Lab seminar, Northeastern University, virtual, “Worst-case Optimal Binary Join Algorithms under General ℓ_p Constraints." July 2022.
6. Integrating Ethics and Social Responsibility in Computing Curricula Symposium, SIGCSE 2020, Porland, OR, “Incorporating Societal Context in an UG Algorithms course." March 2020.
7. MDS20 Minisymposium on Sparse Approximation, Sublinear Time Algorithms, and Applications, virtual meeting, “Sparse Recovery for Orthogonal Polynomial Transforms." June 2020.
8. Open lectures for PhD students in computer science, University of Warsaw, Poland, “(Dense Structured) Matrix Vector Multiplication." May 2018.
9. STOC 2017 Theory Fest, Montreal, Canada, “Answering FAQs in CSPs, Probabilistic Graphical Models, Databases, Logic and Matrix operations." June 2017.
10. Theory Seminar, University of Washington, Seattle, “Answering FAQs in CSPs, PGMs, Databases, Logic and Matrix Operations." June 2015.
11. Workshop on Information Theory in Complexity Theory and Combinatorics, Simons Institute for the Theory of Computing, Berkeley, “Answering FAQs in CSPs, PGMs, Databases, Logic and Matrix Operations." April 2015.
12. Seminar on Algebra in Computational Complexity, Scholss Dagstuhl, Germany, “A Geometric Resolution-based Framework for Joins." September 2014.
13. Georgia Tech., Algorithms and Randomness Center Colloquium, Atlanta, “A tale of two join algorithms." March 2014.
14. IBM India Research Lab, Faculty talk, New Delhi, “A tale of two join algorithms." January 2014.
15. IBM TJ Watson Research Center, IP for Lunch, Yorktown Heights, “A tale of two join algorithms." October 2013.
16. MIT, Algorithms and Complexity Seminar, Boston, “One algorithm to rule them all: One join query at a time." July 2013.
17. University of Michigan, Theory Seminar, Ann Arbor, “One algorithm to rule them all: One join query at a time." February 2013.

18. Seminar on Algebraic and Combinatorial Methods in Computational Complexity, Schloss Dagstuhl, Germany, “One algorithm to rule them all: One join query at a time." October 2012.

19. Search Methodologies III, ZiF, Bielefeld, Germany, “Group Testing and Coding Theory (Tutorial)." September 2012.

20. Workshop on Algorithms for Data Streams, Technical University of Dortmund, Dortmund, Germany, “One Algorithm to rule them all: One join query at a time." July 2012.

21. Workshop on Group Testing Designs, Algorithms, and Applications to Biology, IMA, Minneapolis, “Group Testing and Coding Theory (Tutorial)." February 2012.

22. McMaster University, CAS Department Seminar, Hamilton, Canada, “List Decoding: The Master of Disguise." January 2012.

23. University of Rochester, CS Department Seminar, Rochester, “List Decoding: The Master of Disguise." November 2011.

24. Penn. State, Theory Seminar, University Park, “Group Testing and Coding Theory." October 2011.

25. Workshop on Aspects of Coding Theory, EPFL, Lausanne, Switzerland, “Efficient list decoding with optimal redundancy using folded Reed-Solomon codes." July 2011.

26. Georgia Tech., Algorithms and Randomness Center Colloquium, Atlanta, “Group Testing and Coding Theory." November 2010.

27. Seminar on Algebraic Methods in Computational Complexity, Schloss Dagstuhl, Germany, “Data Stream Algorithms for Codeword Testing." October 2009.

28. Information Theory and Applications Workshop, San Diego, “Collisions Lead to Shallower Decision Trees." February 2009.

29. Joint Mathematics Meetings, AMS Special Session on Recent Trends in Coding Theory, Washington D.C., “Efficient List Decoding of Explicit Codes with Optimal Redundancy." January 2009.

30. The 3rd Western New York Theory Day, Rochester, “Recovering data in presence of malicious errors." May 2008.

31. Caltech, CS Theory Seminar, Pasadena, “Recovering data in presence of malicious errors." February 2008.

32. The 17th Symposium on Applied algebra, Algebraic algorithms, and Error Correcting Codes (AAECC), Special session on List Decoding, Bangalore, India, “Efficient List Decoding of Explicit Codes with Optimal Redundancy." December 2007.

33. Cornell University, CS Theory Seminar, Ithaca, “Recovering data in presence of malicious errors." September 2007.

34. IEEE Society, Seattle Chapter, Seattle, “Explicit Capacity-Achieving List-Decodable Codes." November 2006.

35. INFORMS 2005, Optimal Paths and Orderings session, Network Optimization cluster, San Francisco, “Ordering by Weighted Number of Wins Gives a Good Ranking for Weighted Tournaments." November 2005.

11.4.2 Talks at Universities and Research Labs

1. Carnegie Mellon University, CS Theory Seminar, Pittsburgh, “Recovering data in presence of malicious errors." November 2008.
2. IBM TJ Watson Research Center, IP for Lunch, Yorktown Heights, “Recovering data in presence of malicious errors." July 2008.
3. University of California at San Diego, CSE Colloquium, San Diego, “Error-correction with information-theoretically optimal data rate." April 2007.
4. Toyota Technological Institute at Chicago (TTI-Chicago), TTI-C Colloquium, Chicago, “Error-correction with information-theoretically optimal data rate." April 2007.
5. University of at Buffalo, CSE Colloquium, Buffalo, “Error-correction with information-theoretically optimal data rate." March 2007.
6. University of Florida, CISE Colloquium, Galveston, “Error-correction with information-theoretically optimal data rate." March 2007.
7. Georgia Tech., Algorithms and Randomness Center Colloquium, Atlanta, “Recovering data in presence of malicious errors." January 2007.
8. IBM Almaden Research Center, Theory of Computing talk, San Jose, “Explicit Capacity-Achieving List-Decodable Codes." August 2006.
9. IBM TJ Watson Research Center, IP for Lunch, Yorktown Heights, “Tolerant Locally Testable Codes." June 2005.
10. University of Texas at Austin, Algorithms and Computation Theory Seminar, Austin, “Online Learning in Online Auctions." January 2003.

11.5 Presentations

1. STOC 2024 TheoryFest workshop, Vancouver, “Abstracting away the Deep Learning Mumbo-Jumbo (with Arithmetic Circuits)" (Tutorial). June 2024.
2. Technical Symposium on Computer Science Education (SIGCSE), Toronto, “Teaching Responsible Computing in Context: Models, Practices, and Tools" (Panelist). March 2023.
3. 55th Annual Symposium on Foundations of Computer Science (FOCS), Philadelphia, “Topology Matters in Communication." October 2014.
4. 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Austin, “Efficiently Decodable Non-Adaptive Group Testing." January 2010.
5. 5th Annual International Conference on Computing and Combinatorics (COCOON), Niagara Falls, “Limits of List Decoding Random Codes." July 2009.
6. IEEE 23rd Annual Conference on Computational Complexity (CCC), College Park, “Soft Decoding, Dual BCH Codes, and Better List-Decodable ϵ-Biased Codes." June 2008.

7. 19th Annual ACM-SIAM symposium on Discrete algorithms (SODA), San Francisco, “Concatenated codes can achieve list-decoding capacity." January 2008.

8. 11th International Workshop on Randomization and Computation (RANDOM), Princeton, “Better Binary List-Decodable Codes via Multilevel Concatenation." August 2007.

9. 39th Annual ACM Symposium on Theory of Computing (STOC), San Diego, “Lower bounds for randomized read/write stream algorithms." June 2007.

10. 18th Annual ACM-SIAM symposium on Discrete algorithms (SODA), New Orleans, “Dynamic pricing for impatient bidders." January 2007.

11. 38th Annual ACM Symposium on Theory of Computing (STOC), Seattle, “Explicit capacity-achieving list-decodable codes." May 2006.

12. 17th Annual ACM-SIAM symposium on Discrete algorithm (SODA), Miami, “Ordering by weighted number of wins gives a good ranking for weighted tournaments." January 2006.

13. 37th Annual ACM Symposium on Theory of Computing (STOC), Baltimore, “Limits to list decoding Reed-Solomon codes." May 2005.

14. 9th International Workshop on Randomization and Computation (RANDOM), Berkeley, “Tolerant Locally Testable Codes." August 2005.

15. 25th International Conference on Foundations of Software Technology and Theoretical Computer Science (FST&TCS), Hyderabad, India, “Approximation Algorithms for Wavelength Assignment." December 2005.

16. 15th Annual ACM symposium on Parallel algorithms and architectures (SPAA), San Diego, “Efficient Galois field arithmetic on SIMD architectures." June 2003.