Curriculum Vitae

Venkatesan Guruswami

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Contents

1   Education

Massachusetts Institute of Technology, Cambridge, MA.

Ph.D., Computer Science	August 2001

Dissertation: List Decoding of Error-Correcting Codes
Winner, ACM Doctoral Dissertation Award, 2002.
<u>Advisor</u>: Prof. **Madhu Sudan**

Master of Science, Computer Science	May 1999

Thesis: Query-efficient Checking of Proofs and Improved PCP Characterizations of NP.

Indian Institute of Technology, Madras   (Chennai, India)

Bachelor of Technology (B.Tech), Computer Science and Engineering	June 1997

Postdoctoral fellowship

Miller Research Fellow	Sept 2001 - Aug 2002

Miller Institute for Basic Research in Science
University of California, Berkeley, CA.

2   Employment

University of California, Berkeley	Jan 2022-present

- Chancellor's Professor of Electrical Engineering and Computer Science
- Senior Scientist, Simons Institute for the Theory of Computing
- Interim Acting Director, Simons Institute for the Theory of Computing , July-Dec 2023
- Professor, Department of Mathematics

Computer Science Department
Carnegie Mellon University, Pittsburgh, PA.

• Director of Ph.D. program	June 2019 - Dec 2021
• Professor	July 2014 - Dec 2021
• Associate Professor (tenured)	July 2009 - June 2014
• Visiting Associate Professor	Sept 2008 - June 2009

Visiting Researcher	March-May 2018

Center for Mathematical Sciences and Applications, Harvard University.

Visitng Professor	July 2017-Feb 2018

School of Physical & Mathematical Sciences, Nanyang Technological University, Singapore.

Visiting Researcher	January-June 2014

Microsoft Research New England.

Member, School of Mathematics	Sept 2007 - May 2008

Institute for Advanced Study, Princeton, NJ.

Department of Computer Science and Engineering
University of Washington, Seattle, WA.

• Associate Professor (tenured; on leave)	Sept 2007 - June 2009
• Assistant Professor	Sept 2002 - Sept 2007

3   Research Interests

I am broadly interested in Algorithms, Computational Complexity, Coding/Information Theory, and related mathematics. Specific areas of interest include error-correcting codes, approximation algorithms and hardness of approximation, probabilistically checkable proofs, pseudorandomness and explicit combinatorial constructions, fine-grained complexity, computational and communication complexity, and streaming and sub-linear computation.

4   Memberships

Fellow of the Association for Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), and the American Mathematical Society (AMS).

5   Honors and Awards

Guggenheim Fellowship, 2023.

Distinguished Alumnus Award, Indian Institute of Technology Madras, 2023.

American Mathematical Society (AMS) Fellow, 2023.

Chancellor's Professor, Department of EECS, UC Berkeley, 2022-24.

Simons Investigator, 2020.

IEEE Fellow, 2019.

Association for Computing Machinery (ACM) Fellow, 2017.

EATCS Presburger Award, 2012.

Invited speaker, International Congress of Mathematicians, August 2010.

Best paper award (joint with C. Umans and S. Vadhan), Computational Complexity Conference, 2007.

David and Lucile Packard Fellowship for Science and Engineering, 2005. (One out of **16** fellows.)

Alfred P. Sloan Foundation Fellow, 2005.

Work on algebraic error-correction featured by the National Science Foundation in its "Discoveries" section. Original article, dated August 11, 2004, available at:
`http://nsf.gov/discoveries/discsumm.jsp?cntnid=100256&org=NSF`.

NSF Faculty Early Career Development (CAREER) Award, 2004.

Association for Computing Machinery (ACM) Doctoral Dissertation Award, 2002, for best doctoral thesis in Computer Science and Engineering.

George M. Sprowls Award, MIT, 2002, for best Ph.D thesis submitted to the Department of Electrical Engineering and Computer Science, MIT.

Miller Research Fellowship, 2001.

IEEE Information Theory Society Paper Award (joint with Madhu Sudan), 2000.

IBM Graduate Research Fellowship, 1999-2001.

AT&T Leadership Award, 1997

2nd position in the All India Joint Entrance Examination, 1993, for admissions into the Indian Institutes of Technology (IITs).

1st position, National Maths Talent Test (conducted by the Association of Mathematics Teachers of India), 1993.

3rd position, Indian National Mathematical Olympiad, 1992.

National Board for Higher Mathematics (NBHM) scholarship, India, 1993-97.

National Talent Search Scholar, India, 1991.

6   Professional activities

- *Editor-in-Chief*, Journal of the ACM, November 2021-present.
- Vice Chair, IEEE Technical Committee on Mathematical Foundations of Computing (TCMF), Jan 2022-Dec 2023.
- Simons Institute Scientific Advisory Board, Feb 2020-Dec 2021.
- **President**, Computational Complexity Foundation, June 2018-July 2021.
- ArXiv moderator, cs.IT, April 2018-present.
- *Editor-in-Chief*, ACM Transactions on Computation Theory, 2017-2019.
- Conference Program Committee Chair (Technical)

    - 15th Innovations in Theoretical Computer Science (ITCS) conference, 2024.
    - 41st IARCS Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS, Track A), 2022.
    - 2018 IEEE International Symposium on Information Theory (ISIT, co-chair)
    - 56th IEEE Conference on Foundations of Computer Science (FOCS 2015).
    - 27th IEEE Conference on Computational Complexity (CCC'12), June 2012.

- *Journal Editorial Boards*:

    - TheoretiCS, Dec 2021-present (Inaugural board member).
    - Journal of the ACM, 2015-2021.
    - SIAM Journal on Computing, 2009-17.
    - Research in the Mathematical Sciences, 2016-present.
    - IEEE Transactions on Information Theory, 2010-2013.
    - ACM Transactions on Computation Theory, 2008-2015.

- Workshop/program organization

    - Co-organizer, Dagstuhl Seminar on The Constraint Satisfaction Problem: Complexity and Approximability, May/June 2025.
    - Co-organizer, Semester program "Error-correcting codes: Theory and Practice", Spring 2024, Simons Institute for the Theory of Computing.
    - Co-organizer, Dagstuhl Seminar in May 2022 on The Constraint Satisfaction Problem: Complexity and Approximability.
    - Co-organizer, Dagstuhl Seminar in June 2018 on The Constraint Satisfaction Problem: Complexity and Approximability.
    - Co-organizer, Workshop on Mathematics of Information-Theoretic Cryptography, Institute of Mathematical Science, National University of Singapore, September 2016.
    - Co-organizer, Semester program on Information Theory, Spring 2015, Simons Institute for the Theory of Computing.

- – Co-organizer, Dagstuhl Seminar in July 2015 on The Constraint Satisfaction Problem: Complexity and Approximability.
  - – Co-organizer, School and Workshop on Mathematics of Information-Theoretic Cryptography, Lorentz Center, Leiden, May 13-17 and May 21-25, 2013,
  - – Co-organizer, Summer Thematic Program on Constraint Satisfaction, Fields Institute, Toronto, July-August 2011.
- Member, Board of Trustees and Awards Chair, Computational Complexity Foundation, Inc., August 2014-present.
- SIGACT executive committee member, July 2012-June 2015.
- Conference Steering Committee, IEEE Conference on Computational Complexity (CCC), July 2012-August 2014.
- Scientific board member, Electronic Colloquium on Computational Complexity, 2009-present.
- Area editor (Coding algorithms), Encyclopedia of Algorithms (published by Springer)
- Guest editorshop for journal special issues:
  - – Guest co-editor (with S. Chawla and C. Dwork), *SIAM J. Computing*, special issue on selected papers from STOC 2008.
  - – Guest co-editor (with V. Kabanets), *Computational Complexity*, **16**(2), 2007. Special issue on selected papers from CCC 2006 – the 21st IEEE Conference on Computational Complexity.
  - – Guest co-editor (with E. Cohen), *Journal of Computer and System Sciences*, **68**(4), June 2004. Special issue on selected papers from FOCS 2002.
- Conference Program Committee memberships:
  - (i) *STOC 2022*, 54th ACM Symposium on Theory of Computing, June 2022.
  - (ii) *FOCS 2019*, 60th Annual IEEE Symposium on Foundations of Computer Science, November 2019.
  - (iii) *APPROX 2017*, 20th Intl. Workshop on Approximation Algorithms for Combinatorial Optimization Problems, August 2017.
  - (iv) *STOC 2015*, 47th ACM Symposium on Theory of Computing, June 2015.
  - (v) *ISITA 2012*, International Symposium on Information Theory and its Applications, October 2012.
  - (vi) *ISIT 2012*, IEEE International Symposium on Information Theory, July 2012.
  - (vii) *STOC 2011*, 43rd ACM Symposium on Theory of Computing, June 2011.
  - (viii) *CCC 2010*, 25th IEEE Conference on Computational Complexity, June 2010.
  - (ix) *SODA 2010*, ACM-SIAM Symposium on Discrete Algorithms, Janurary 2010.
  - (x) *FSTTCS 2008*, 28th Annual Conference on Foundations of Software Technology and Theoretical Computer Science, December 2008.
  - (xi) *STOC 2008*, 40th ACM Symposium on Theory of Computing, May 2008.
  - (xii) *ITW 2008*, Information Theory Workshop, May 2008.
  - (xiii) *LATIN 2008*, 8th Latin American Theoretical Informatics Symposium, April 2008.
  - (xiv) *CATS 2008*, Computing: The Australasian Theory Symposium, January 2008.
  - (xv) *APPROX 2007*, 10th Intl. Workshop on Approximation Algorithms for Combinatorial Optimization Problems, August 2007.
  - (xvi) *ISIT 2006*, IEEE International Symposium on Information Theory, July 2006.
  - (xvii) *CCC 2006*, 21st IEEE Conference on Computational Complexity, July 2006.
  - (xviii) *FOCS 2005*, 46th Annual IEEE Symposium on Foundations of Computer Science, October 2005.
  - (xix) *FSTTCS 2005*, 25th Annual Conference on Foundations of Software Technology and Theoretical Computer Science, December 2005.
  - (xx) *FOCS 2002*, 43rd Annual IEEE Symposium on Foundations of Computer Science, November 2002.
- *Organizer, Minisymposium on coding theory, DM 2006*: SIAM Conference on Discrete Mathematics, June 2006.

7   Undergraduate Student Mentoring

At University of California, Berkeley

- Rohit Agarwal (2023-24).
  Working on research on topics in constraint satisfaction and coding theory.

At Carnegie Mellon University

- Omar Alrabiah (2018-21).
  Worked on research in error-correcting codes leading to papers at the STOC 2019 and RANDOM 2021 conferences.

- Zhen Zhou (2019-20).
  Honors thesis: "2-deletion codes: Beyond binary"

- Patrick Lin (2018-19).
  Worked on senior thesis on parameterized approximation.

- Joshua Brakensiek (2015-18).
  Winner of the 2018 CRA Outstanding Undergraduate Researcher award.
  Honors/Master's thesis: "Polymorphic Inquiries: Promise Constraint Satisfaction and Beyond?
  Worked on research in coding theory and constraint satisfaction leading to numerous publications (eg. in SODA 2016, CCC 2016, APPROX 2017, SODA 2018, STOC 2019 (x2), SODA 2019).

- Ray Li (2016-17).
  Honors thesis: "New developments in coding against insertions and deletions"
  Worked on codes for insertions and deletions leading to publications in ISIT 2016, RANDOM 2017, and SODA 2018.

8   Graduate Student Mentoring

Current Ph.D. students

- Omar Alrabiah (3rd year)

- Louis Golowich (2nd year)

- Meghal Gupta (2nd year)

- Allan Li (2nd year, Mathematics)

- Peter Manohar (5th year, at Carnegie Mellon, co-advised with Pravesh Kothari)

- Xuandi Ren (2nd year)

- Pranav Trivedi (4th year, Mathematics)

Graduated PhD students

At University of Washington

- Atri Rudra, June 2007.
  Dissertation title: *List decoding and property testing of error-correcting codes.*
  Co-winner of the William Chan Memorial Dissertation Award at the University of Washington.
  Atri is a Professor at University at Buffalo, The State University of New York.

- Prasad Raghavendra, August 2009.
  Dissertation title: *Approximating NP-hard problems: Efficient algorithms and their limits.*
  Co-winner of the William Chan Memorial Dissertation Award at the University of Washington.
  Prasad is a Professor at the University of California, Berkeley.

At Carnegie Mellon University

- Ali Kemal Sinop, May 2012.
  Dissertation title: *Graph partitioning and semidefinite programming hierarchies.*
  Ali Kemal is currently a research scientist at Google.

- Yuan Zhou, August 2014.
  Dissertation title: *New Directions in Approximation Algorithms and Hardness of Approximation.*
  Yuan is currently a faculty at the Yau Mathematical Sciences Center at Tsinghua University.

- Carol Wang, September 2015.
  Dissertation title: *Beyond unique decoding: topics in error-correcting codes.*
  Carol is currently employed at Google.

- Ameya Velingker, August 2016.
  Dissertation title: *New Directions in Coding Theory: Capacity and Limitations*
  Ameya is currently a research scientist at Google.

- Euiwoong Lee, May 2017.
  Dissertation title: *Optimal Approximabilities beyond CSPs*
  Winner of the Edmund M. Clarke Doctoral Dissertation Award.
  Euiwoong is an Assistant Professor at the University of Michigan.

- Vijay Bhattiprolu, June 2019.
  Dissertation title: *On the Approximability of Injective Tensor Norm*
  Vijay is currently an Assistant Professor at the University of Waterloo.

- Nicolas Resch, May 2020.
  Dissertation title: *List-Decodable Codes: (Randomized) Constructions and Applications*
  Nic is a faculty member at the University of Amsterdam.

- Andrii Riazanov, May 2022.
  Dissertation title: *Polar Codes with Near-Optimal Convergence to Channel Capacity*
  Andrii is employed at the Susquehanna International Group, a global quantitative trading firm.

- Sai Sandeep, Aug 2022.
  Dissertation title: *New Directions in Inapproximability: Promise Constraint Satisfaction Problems and Beyond*
  Sandeep is currently employed at Citadel.

9 Postdoctoral mentoring

- Hsin-Po Wang, Oct 2022-present.

- Sai Sandeep, Sep 2022-May 2023.
  Current employment: Citadel

- Ray Li, Aug 2022-Aug 2023.
  Current employment: Santa Clara University (Assistant Professor)

- Joao Ribeiro, Aug 2021-Feb 2023.
  Current employment: Universidade Nova de Lisboa (Assistant Professor)

- Jonathan Mosheiff, Oct 2019-Mar 2022.
  Current employment: Ben-Gurion University (Senior Lecturer (Assistant Professor))

- Alperen Ergur, Sept 2019-Aug 2020.
  Current employment: Univ. of Texas at San Antonio (Assistant Professor of Mathematics)

- Mary Wootters, Sept 2014-July 2016.
  Current employment: Stanford University (Associate Professor)

- Ankit Singh Rawat, Sept 2015-August 2016.
  Current employment: Google Research (New York)

- Mahdi Cheraghchi, Sept 2011-June 2013.
  Current employment: University of Michigan (Associate Professor)

- Krzysztof Onak (Simons postdoctoral fellow), Sept 2010-Aug 2012.
  Current employment: Boston University (Assistant Professor)

- Rishi Saket, Sept 2009-Aug 2010.
  Current employment: Google Research India

- Parikshit Gopalan, March 2007-June 2008.
  Current employment: Apple Research

10   Department and University Service

10.1   University of Washington

Graduate admissions committee for Fall 2007 graduate applications.

Graduate admissions committee for Fall 2006 graduate applications.

Graduate admissions committee for Fall 2005 graduate applications.

Revamped the webpage for the theoretical computer science group (Fall 2005)

University wide Graduate School Representative (GSR) for following exams:

> General examination of Hongxiang Li, Department of Electrical Engineering, May 2007. Chair: Prof. Hui Liu.
>
> General examination of Lili Zhou, Department of Electrical Engineering, December 2005. Chair: Prof. Richard Shi.
>
> Ph.D. Final Examination of Mark Holland, Department of Electrical Engineering, July 2005. Chair: Prof. Scott Hauck.
>
> General Examination of Chunhua Weng, Department of Medical Education and Biomedical Informatics, January 2005. Chair: Prof. John Gennari.
>
> General Examination of Mark Holland, Department of Electrical Engineering, May 2004. Chair: Prof. Scott Hauck.
>
> Ph.D. Final Examination of Hao Li, Department of Electrical Engineering, March 2004. Chair: Prof. Chen-Ching Liu.
>
> General Examination of Hao Li, Department of Electrical Engineering, September 2003. Chair: Prof. Chen-Ching Liu.

10.2   Carnegie Mellon University

- School of Computer Science Reappointment and Promotion committee, 2018 and 2019.

- Service for the Computer Science Department:

    PhD program director, 2019-21.

    Faculty award nominations coordinator, 2015-19.

    Faculty coordinator, Open House (for admitted Ph.D. students), 2013.

    Member, Undergraduate Review Committee (URC), 2013-18.

    Faculty hiring committee, 2010-11 and 2011-12.

    Doctoral Review Committee (DRC): Member 2009-2018; Chair 2019-21.

    Several ad hoc promotion committees, including chairing for a few.

10.3   University of California, Berkeley

Acting Director, Simons Institute for the Theory of Computing, July-December 2023.

EECS PhD admissions committee, 2022-23.

Management and leadership team, Simons Institute for the Theory of Computing, Jan 2022-present.

PhD qualifying exam committees:

- Sidhanth Mohanty (EECS), Chair, March 2022.
- Pranav Trivedi (Math), July 2022,
- Isabel Detherage (Math), Chair, December 2023.

11   Presentations

Selected invited talks/lecture series (since 2010)

- T1) 'Solving semirandom planted CSPs via SDP-certificates and spectral sparsification," Stanford ISL Colloquium, February 2024.

- T2) "The Exponential Time Hypothesis implies the Parameterized Inapproximability Hypothesis," Institute of Mathematical Sciences, Chennai, Dec 2023.

- T3) "'Parameterized hardness of approximating the minimum distance problem on codes," Institute of Mathematical Sciences, Chennai, Dec 2023.

- T4) "Solving semirandom planted CSPs via SDP-certificates and spectral sparsification," Workshop on Spectral Methods (post FSTTCS workshop), Hyderabad, Dec 2023.

- T5) ""When and why do efficient algorithms exist (for constraint satisfaction and beyond)?" Colorado College, Mathematics and Computer Science Colloquium, Sep 2023.

- T6) "How non-commutativity helps data centers: Maximally Recoverable codes from skew polynomials," Plenary talk at Workshop on Algebra and Computation, Gothenburg, Sweden, August 2023.

- T7) Two talks: "Parameterized hardness of approximating the minimum distance problem on codes" and "Baby PIH: Parameterized inapproximability of Min CSP" at the Dagstuhl seminar on Parameterized Approximation: Algorithms and Hardness, July 2023.

- T8) "A near-cubic lower bound for 3-query locally decodable codes," Institute of Mathematical Sciences, Chennai, Dec 2022.

T9) "When and why do efficient algorithms exist (for constraint satisfaction and beyond)?" Cornell University CS Colloquium, Nov 2022.

T10) "When and why do efficient algorithms exist (for constraint satisfaction and beyond)?" University of Rochester CS Colloquium, Nov 2022.

T11) "A near-cubic lower bound for 3-query locally decodable codes," TCS+ invited seminar, Oct 2022.

T12) "Recent Progress on Binary Deletion-Correcting Codes," International Conference on Coding and Cryptography (ICCC, Virtual), May 2022.

T13) "Recent Progress on Binary Deletion-Correcting Codes," UC Santa Barbara Theory Seminar, March 2022.

T14) "Recent Progress on Binary Deletion-Correcting Codes," Highlights of Algorithms, Survey Talk, June 2021.

T15) "The polymorphic gateway between structure and algorithms: Constraint Satisfaction and Beyond," Shanghai Jiao Tong University Colloquium (virtual), April 2021.

T16) "Strong refutation of semi-random Boolean CSPs," CSDM seminar, Institute for Advanced Study, March 2021.

T17) "Arıkan meets Shannon: Polar codes with near-optimal convergence to channel capacity," Shanghai Jiao Tong University (virtual seminar), September 2020.

T18) "Arıkan meets Shannon: Polar codes with near-optimal convergence to channel capacity," TCS-plus seminar series, April 2020.

T19) "Sub-packetization of Minimum Storage Regenerating codes: A lower bound and a work-around," Google Research, Mountain View, August 2019.

T20) "The polymorphic gateway between structure and algorithms: Constraint Satisfaction and Beyond," TCS-IITM Colloquium, Indian Institute of Technology Madras, March 2019.

T21) "Sub-packetization of Minimum Storage Regenerating codes: A lower bound and a work-around", Theory seminar, Stanford University, February 2019.

T22) "Solving a linear system with a global congruency constraint," Institute of Mathematical Sciences, Chennai, India, January 2019.

T23) "Algebraic CSP dichotomy theorem: A polymorphic gateway between structure and algorithms," Plenary lecture, Oberwolfach Complexity Theory meeting, Mathematisches Forschungsinstitut Oberwolfach, November 2018.

T24) "Lossless dimension expanders," Oberwolfach Complexity Theory meeting, Mathematisches Forschungsinstitut Oberwolfach, November 2018.

T25) "The polymorphic gateway between structure and algorithms: CSPs and beyond," Distinguished Lecture, Department of Computer Science, University of Illinois at Urbana-Champaign, October 2018.

T26) "The polymorphic gateway between structure and algorithms: Beyond CSPs," Algorithms and Randomness Center Colloquium, Georgia Tech, December 2018.

T27) "How many deleted bits can one recover?", Georgia Tech undergraduate "big-O" theory club, December 2018.

T28) "Polymorphic inquiries: (Promise) constraint satisfaction, fine-grained complexity, and more," Lecture series (5×1.5 hours), Institute of Mathematical Sciences, Chennai, India, July-August 2018.

T29) "Improved bounds for perfect hashing," MIT Algorithms and Complexity seminar, May 2018.

T30) "Polymorphisms beget algorithms: Promise CSP, fine-grained complexity, and more," 3 hour lecture, Harvard University (Center of Mathematical Sciences and Applications), May 2018.

T31) "Ta-Shma's explicit construction of near optimal low-rate binary codes," 3 hour lecture, Harvard University (Center of Mathematical Sciences and Applications), March 2018.

T32) "A lower bound for maximally recoverable codes with locality," CQT, National University of Singapore, February 2018.

T33) "Promise Constraint Satisfaction," CQT, National University of Singapore, Janurary 2018.

T34) "Subspace evasion, list decoding, and dimension expanders," Harvard CMSA workshop on algebraic methods in combinatorics, Nov 2017.

T35) "Promise Constraint Satisfaction," MIT Theory Colloquium, Nov 2017.

T36) "Progress in Error-Correction: A Survey," Mathematics Colloquium, Nanyang Technological University, September 2017.

T37) "Linear-algebraic pseudorandomness: Subspace designs and dimension expanders," Simons Institute Workshop on Proving and Using Pseudorandomness, Berkeley, March 2017.

T38) "Progress in error-correction: New codes for old noise models," Distinguished Lecture Series, School of Computer and Communication Sciences, École Polytechnique Fédérale de Lausanne, November 2016.

T39) "$(2 + \epsilon)$-SAT is NP-hard, and further results on promise constraint satisfaction," Krannert School of Management Speaker Series, Purdue University, November 2016.

T40) "Progress in error-correction: New codes for old noise models," Distinguished Lecture Series, College of Information and Computer Sciences, University of Massachusetts, Amherst, October 2016.

T41) "Repairing Reed-Solomon codes," Dagstuhl seminar on Coding Theory in the time of big data, August 2016.

T42) "Recent progress on codes for worst-case deletions," ICERM Workshop on Algorithmic Coding Theory, June 2016.

T43) "An Improved Bound on the Fraction of Correctable Deletions," Simons Institute Information Theory reunion workshop, June 2016.

T44) "Analysis of polymorphisms and promise constraint satisfaction," Simons Symposium on Analysis of Boolean Functions, Schloss Elmau, April 2016.

T45) "Coloring low-discrepancy hypergraphs, Weak Polymorphisms, and Promise Constraint Satisfaction," NII Shonan Meeting on Current Trends in Combinatorial Optimization, April 2016.

T46) "Recent progress on codes for worst-case deletions," Algorithms and Computation Theory Seminar, University of Texas at Austin, February 2016.

T47) "Repairing Reed-Solomon Codes," Oberwolfach Complexity Theory Meeting, November 2015.

T48) "Progress in error-correction: New codes for old noise models," EECS Distinguished Speaker Series, Northwestern Universty, October 2015.

T49) "Progress in error-correction: New codes for old noise models," ECE Colloquium, University of Illinois at Urbana-Champaign, October 2015.

T50) "List and local error-correction," 8th North American School of Information Theory, 3 hour tutorial, August 10-13, 2015.

T51) "Advances in Error-correction: List decoding and polar coding," Swedish Summer School in Computer Science, Five 2.5 hour lectures, June 28-July 4, 2015.

T52) "Communication with Imperfectly Shared Randomness," Banff workshop on Communication Complexity and Applications: August 2014.

T53) "Reed-Muller testing: implications for small set expansion & hypergraph coloring," Bertinoro Workshop on Sublinear Algorithms, Bertinoro, Italy: May 2014.

T54) "Polar codes: Reliable communication with complexity scaling polynomially in the gap to Shannon capacity," Invited talk, New York area Theory Day, Columbia University: April 2014.

T55) "Polar codes: Reliable communication with complexity polynomial in the gap to Shannon capacity," Coding Theory Workshop, AUB Center for Advanced Mathematical Sciences, Beirut, Lebanon: April 2014.

T56) "List error-correction with information-theoretically minimal redundancy," 3 hour invited lecture, 2014 IEEE European School of Information Theory, Tallinn, Estonia: April 2014.

T57) "Superlinear lower bounds for multipass graph processing," Brown ICERM Theory Seminar: April 2014.

T58) "Polar codes: Reliable communication with complexity polynomial in the gap to Shannon capacity," Invited talk at 33rd Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), Guwahati, India: December 2013.

T59) "List decoding by evading subspaces," 3 hour lecture, Microsoft Research New England/MIT theory reading group: February 2014.

T60) "Polar codes: Reliable communication with complexity scaling polynomially in the gap to Shannon capacity," MIT Theory Colloquium: February 2014.

T61) Simons Symposium on New Approaches in Approximation Algorithms for NP-hard problems, "Rounding Lasserre SDPs using column selection for spectrum-based guarantees," February 2013.

T62) University of Warsaw, Phdopen lectures, "Algorithmic coding theory: Some recent advances," 7 hours of lectures, November 2012.

T63) University of Maryland, Invited lecture in theory day, "Linear-algebraic list decoding and subspace-evasive sets," October 2012.

T64) Tsinghua-MIT-CUHK Research Center Workshop on Theoretical Computer Science, "Lasserre hierarchy, higher eigenvalues, and graph partitioning," July 2012.

T65) Presburger Award lecture, ICALP 2012, "List decoding and pseudorandomness: A web of connections," July 2012.

T66) Institute for Advanced Study, CSDM seminar, "Lasserre hierarchy, higher eigenvalues, and graph partitioning," Feb 2012.

T67) Charles University, KAM Mathematical Colloquium, "List error-correction algorithms: A survey," Nov 2011.

T68) Chennai Mathematical Institute, Workshop on Pseudorandomness, 4 lectures on algebraic list decoding, locally decodable codes, and related pseudorandomness, August 2011.

T69) Princeton center for computational intractability, Workshop on Approximation Algorithms: The Last Decade and the Next, " PCPs and Inapproximability: Recent Milestones, and New and Continuing Challenges," June 2011.

T70) MIT Theory Colloquium, "Bridging Shannon and Hamming: Codes for computationally simple channels," March 2011.

T71) Institut Henri Poincare, Workshop on Metric embeddings, algorithms and hardness of approximation, "Bypassing UGC: Inapproximability of Subspace Approximation," January 2011.

T72) Weizmann Institute, Walmart Lecture Series in Cryptography and Complexity, "Bridging Shannon and Hamming: Codes for computationally simple channels," December 2010.

T73) 3rd Eastern Great Lakes Theory of Computation Workshop, University at Buffalo, "Bridging Shannon and Hamming: Codes for computationally simple channels," October 2010.

T74) Koetterfest, Workshop on Facets of Coding Theory: from Algorithms to Networks, "On the list-decodability of random linear codes," September 2010.

T75) ICM 2010 Satellite Conference On Algebraic and Probabilistic Aspects of Combinatorics and Computing, "List-decodability of random linear codes," August 2010.

T76) International Congress of Mathematicians (ICM), Invited sectional talk (Mathematical aspects of Computer Science), "Bridging Shannon and Hamming: List Error-Correction with Optimal Rate," August 2010.

12 Publications

12.1 Books

[B1] V. Guruswami. *List decoding of error-correcting codes.* Springer, Lecture Notes in Computer Science 3282, 2004. (Winning Thesis of the 2002 ACM Doctoral Dissertation Competition).

[B2] V. Guruswami. *Algorithmic Results in List Decoding*, volume 2 of *Foundations and Trends in Theoretical Computer Science (FnT-TCS)*. NOW publishers, January 2007.

12.2 Journal publications

[J1] M. S. Madanlal, V. Guruswami, and C. P. Rangan. Tree 3-spanners on interval, permutation, and regular bipartite graphs. *Information Processing Letters*, 59:97–102, 1996.

[J2] V. Guruswami, U. Rotics, M. S. Madanlal, J. Makowsky, and C. P. Rangan. Restrictions of minimum spanner problems. *Information and Computation*, 136(2):143–164, 1997.

[J3] V. Guruswami and C. P. Rangan. A natural family of optimization problems with arbitrarily small approximation thresholds. *Information Processing Letters*, 68(5):241–248, 1998.

[J4] V. Guruswami. Maximum cut on line and total graphs. *Discrete Applied Mathematics*, 92:217–221, 1999.

[J5] V. Guruswami. Enumerative aspects of certain classes of perfect graphs. *Discrete Mathematics*, 205:97–117, 1999.

[J6] V. Guruswami and M. Sudan. Improved decoding of Reed-Solomon and Algebraic-geometric codes. *IEEE Transactions on Information Theory*, 45(6):1757–1767, 1999.

[J7] V. Guruswami and C. P. Rangan. Algorithmic aspects of clique-transversal and clique-independent sets. *Discrete Applied Mathematics*, 100(3):183–202, 2000.

[J8] V. Guruswami and M. Sudan. On representations of Algebraic-geometric codes for list decoding. *IEEE Transactions on Information Theory*, 47(4):1610–1613, 2001.

[J9] V. Guruswami, C. P. Rangan, M. Chang, G. J. Chang, and C. K. Wong. The K_r-packing problem. *Computing*, 66(1):79–89, 2001.

[J10] V. Guruswami, J. Håstad, M. Sudan, and D. Zuckerman. Combinatorial bounds for list decoding. *IEEE Transactions on Information Theory*, 48(5):1021–1035, 2002.

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12.4 Invited papers and surveys

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