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(Updated on October 18, 2024)

Academic and Research Positions

University of Nebraska–Lincoln

Professor of Comp. Science and Engg./School of Computing.	Sept 2015 – Present
Professor of Mathematics (Courtesy).	Sept 2016 – Present
Susan Rosowski Professor of Computer Science and Engineering.	May 2010 – Aug 2015
Associate Professor of Computer Science and Engineering.	Sept 2007 – August 2015
Assistant Professor of Computer Science and Engineering.	Sept 2001 – Aug 2007

Simons Institute for Theory of Computing

Visiting Scientist (Meta-Complexity). Spring 2023

National University of Singapore

Visiting Professor of School of Computing. July 2019 – Dec 2019

Johns Hopkins University

Visiting Associate Professor of Computer Science. July 2011 – Aug 2013

NEC Research Institute, Princeton

Postdoctoral Research Scientist. Oct 2000 – Aug 2001

University of Aarhus, Denmark

Research Assistant Professor of BRICS, Dept. of Computer Science. Mar 1999 – Sept 2000

Education

Doctor of Philosophy, Institute of Mathematical Sciences, Chennai, India.	Feb 1999
Master of Science, Indian Institute of Technology, Chennai, India.	Aug 1993
Bachelor of Technology, Regional Engineering College, Calicut, India.	Oct 1990

Honors and Awards

Research Excellence Award, UNL, College of Engineering 2022–2023.
Communications of the ACM Research Highlights 2023.
SIGMOD Research Highlights Award 2022.
Best of PODS 2021.
Student Choice Outstanding Teaching award, Computer Sc. and Engg., UNL, 2016–2017.
Susan Rosowski Professorship, UNL 2010–2015.
Distinguished Teaching Award, College of Arts and Sciences, UNL, 2005.

Research Funding

Collaborative Research: AF:Small:NSF-DST: New Directions in Data Streaming: Models and Algorithms (PI). NSF Algorithmic Foundations. Total amount: $600,000. UNL amount: $324,999. Award period: 10/01/2024 – 9/30/2027.

Collaborative Research: AF: Small: New Directions in Algorithmic Replicability (PI). NSF Algorithmic Foundations. Total amount: $600,000. UNL amount: $337,697. Award period: 03/01/2024 – 02/28/2027.

Collaborative Research:AF:Weak Derandomizations in Time and Space Complexity (PI). NSF Algorithmic Foundations. Total amount: $500,000. UNL amount: $271,995. Award period: 10/01/2021 – 09/30/2025.

REU Supplement to Collaborative Research:AF:Weak Derandomizations in Time and Space Complexity NSF Algorithmic Foundations. UNL amount: $8000. Award period: 07/01/2022 – 06/30/2023.

HDR TRIPODS:D4 (Dependable Data-Driven Discovery) Institute (Senior Personnel). NSF. Total amount $1,000,000. UNL amount: $103,324. Award period: 10/01/2019 – 9/30/2022.

Operationalizing Cyber Situational Awareness Research: Capability Exploration (Co-PI). National Strategic Research Institute (NSRI). UNL amount: $336,754. Award period: 07/25/2018 – 07/24/2019.

Collaborative Research:EAGER:AF:Weak Derandomizations in Time and Space Complexity (PI). NSF Algorithmic Foundations. Total amount: $100,000. UNL amount: $50,000. Award period: 10/01/2018 – 09/01/2019.

Operationalizing Cyber Situational Awareness Research: Discovery Study (Co-PI). National Strategic Research Institute. Total amount: $100,000. UNL amount: $57,560. Award period: 03/26/2018 – 11/25/2018.

Collaborative Research:AF:Small:Exploring New Approaches in Space-bounded Computation (PI). NSF Algorithmic Foundations. Total amount $464,221. UNL amount: $246,079. Award period: 09/01/2014 – 08/31/2018.

Collaborative Research:AF:Small:Research in Nonuniformity, Completeness, and Reachability (PI). NSF Algorithmic Foundations. Total amount $500,000. UNL amount: $272,031. Award period: 08/01/2009 – 07/31/2014.

Collaborative Research:Research in Computational Complexity (PI). NSF Theory of Computing. Total amount $207,277. UNL amount: $104,086. Award period: 08/01/2008 – 07/31/2010.

Studies in Computational Complexity Theory (PI). NSF Theory of Computing. Total and UNL amount: $200,000. Award period: 08/01/2004 – 07/31/2008.

Secure Group Communications (SGC) over Wired and Wireless Networks (Co-PI). NSF Trusted Computing. Total and UNL amount: $349,990. Award period: 08/01/2003 – 09/30/2007.

Randomized Algorithms for Spatiotemporal Databases (Co-PI). NASA Nebraska Space Grant and EPSCoR. Total and UNL amount: $18,000. Award period: 03/1/2004 – 02/28/2005.

UNL Funding

Quantum Approaches Addressing Global Threats (Co-PI). UNL Grand Challenges Catalyst Competition – Catalyst Awards. Total amount: $4,172,881. Award period: 10/01/23 – 9/30/28.

Algorithms for Large Data Set Problems (PI). Layman Award. Total amount: $10,000. Award period: 06/01/2015 – 05/31/2017.

Program checkers for NP-complete problems and *Complexity of Individual Sequences.* Big-12 Fellowships. Total amount: $2500. Award period: 07/01/2004 – 06/310/2005.

Program Checking Infrastructure for Cyber Security Applications (PI). Layman Award. Total amount: $10,000. Award period: 05/01/ 2004 – 04/30/2005.

Secure E-Services: Access control issues in banking and financial systems (Co-PI). UNL ERP Project. Total amount: $8,400. Award period: 11/01/2002 – 05/31/2003.

A Complexity-theoretic Approach to Learning Theory (PI). Faculty Seed Grant from the Research Council of University of Nebraska–Lincoln. Total amount: $7,000. Award period: 01/01/2002 – 12/31/2002.

Publications

Peer Reviewed Conference Publications

C63 Jason Vander Woude, Peter Dixon, A. Pavan, Jamie Radcliffe and N. V. Vinodchandran. Replicability in Learning: Geometric Partitions and KKM-Sperner Lemma. *Advances in Neural Information Processing Systems 2024 (NeurIPS 2024)* (To Appear).

C62 Mridul Nandi, N. V. Vinodchandran, Arijit Ghosh, Kuldeep S. Meel, Soumit Pal and Sourav Chakraborty. Improved Streaming Algorithm for the Klee's Measure Problem and Generalizations. *Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX/RANDOM 2024)*, pages 26:1-26:21.

C61 A. Bhattacharyya, S. Gayen, K. S. Meel, D. Myrisiotis, A. Pavan and N. V. Vinodchandran. Total Variation Distance Estimation Is as Easy as Probabilistic Inference. *International Conference on Machine Learning 2024 (ICML 2024).*

C60 Sourav Chakraborty, Kuldeep Meel, A Pavan and N. V. Vinodchandran. On the Feasibility of Forgetting in Data Streams. *ACM Symposium on Principles of Database Systems 2024 (PODS 2024)*, pages 2(2):1–17.

C59 P. Dixon, A. Pavan, J. Vander Woude, N. V. Vinodchandran. List and Certificate Complexities in Replicable Learning. *Advances in Neural Information Processing Systems 2023 (NeurIPS 2023)*, pages 30784–30806.

Spotlight Paper (∼ top 3%)

C58 M. Chen, A. Pavan, N. V. Vinodchandran. Relations between Space-Bounded and Adaptive Massively Parallel Computations. *International Symposium on Distributed Computing 2023 (DISC 2023)*, pages 37:1-37:7.

C57 A. Bhattacharyya, S. Gayen, K. S. Meel, D. Myrisiotis, A. Pavan, N. V. Vinodchandran. On Approximating Total Variation Distance. *International Joint Conference on Artificial Intelligence 2023 (IJCAI 2023)*, pages 3479–3487.

C56 A. Pavan, K. S. Meel, N. V. Vinodchandran, A. Bhattacharyya. Constraint Optimization over Semirings. *AAAI Conference on Artificial Intelligence 2023 (AAAI 2023)*, pages 4070–4077.

C55 S. Chakraborty, N. V. Vinodchandran, K. S. Meel. Distinct Elements in Streams: An Algorithm for the (Text) Book. *European Symposium on Algorithms 2022 (ESA 2022)*, pages 34:1–34:6.

C54 P. Dixon, A. Pavan, J. Vander Woude, N. V. Vinodchandran. Pseudodeterminism: Promises and Lowerbounds. *ACM Symposium on Theory of Computing 2022 (STOC 2022)*, pages 1552–1565.

C53 K. S. Meel, S. Chakraborty, N. V. Vinodchandran. Estimation of the Size of Union of Delphic Sets: Achieving Independence from Stream Size. *ACM Symposium on Principles of Database Systems 2022 (PODS 2022)*, pages 41–52.

C52 A. Bhattacharyya, S. Gayen, S. Kandasamy, V. Raval, N. V. Vinodchandran. Efficient Interventional Distribution Learning in the PAC Framework. *International Conference on Artificial Intelligence and Statistics 2022 (AISTATS 2022)*, pages 7531–7549.

C51 E. Baranov, S. Chakraborty, A. Legay, K. S. Meel, N. V. Vinodchandran. A Scalable t-wise Coverage Estimator. *IEEE International Conference on Software Engineering 2022 (ICSE 2022)*, pages 36–47.

C50 A. Bhattacharyya, S. Gayen, E. Price, N. V. Vinodchandran. Near-Optimal Learning of Tree-Structured Distributions by Chow-Liu. *ACM Symposium on Theory of Computing 2021 (STOC 2021)*, pages 147–160.

C49 S. Chakraborty, K. S. Meel, N. V. Vinodchandran. Estimating Size of Union of Sets in Streaming Model. *ACM Symposium on Principles of Database Systems 2021 (PODS 2021)*, pages 126–137.

C48 A. Bhattacharyya, A. Pavan, Kuldeep S. Meel, N. V. Vinodchandran. Model Counting meets F_0 Estimation. *ACM Symposium on Principles of Database Systems 2021 (PODS 2021)*, pages 299–311.

Best of PODS 2021, 2022 SIGMOD Research Highlights Award, 2023 CACM Research Highlights Award.

C47 A. Bhattacharyya, S. Gayen, S. Kandasamy, N. V. Vinodchandran. Testing Product Distributions: A Closer Look. *Algorithmic Learning Theory 2021 (ALT 2021)*, pages 367–396.

C46 P. Dixon, A. Pavan, N. V. Vinodchandran. Complete Problems for Multi-Pseudodeterministic Computations. *Innovations in Theoretical Computer Science 2021 (ITCS 2021)*, pages 66:1–66:16.

C45 P. Dixon, Sutanu Gayen, Aduri Pavan, N. V. Vinodchandran. Perfect Zero Knowledge: New Upperbounds and Relativized Separations. *Theory of Cryptography Conference 2020 (TCC 2020).* Lecture Notes in Computer Science, vol 12550, TCC (1) 2020, pages 684–704.

C44 A. Bhattacharyya, S. Gayen, K. S. Meel, N. V. Vinodchandran. Efficient Distance Approximation for Structured High-Dimensional Distributions via Learning. *Advances in Neural Information Processing Systems 2020 (NeurIPS 2020).*

C43 A. Bhattacharyya, S. Gayen, S. Kandasamy, A. Maran, N. V. Vinodchandran. Learning and Sampling of Atomic Interventions from Observations. *International Conference on Machine Learning 2020 (ICML 2020)*, PMLR 119:842–853, 2020.

C42 S. Behera, S. Gayen, J. S. Deogun, N. V. Vinodchandran. KmerEstimate: A Streaming Algorithm for Estimating k-mer Counts with Optimal Space Usage. *ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics 2018 (ACM-BCB 2018)*, pages 438–447.

C41 P. Dixon, A. Pavan, N. V. Vinodchandran. On Pseudodeterministic Approximation Algorithms. *International Symposium on Mathematical Foundations of Computer Science 2018 (MFCS 2018)*, LIPIcs vol 117, 61:1–61:11.

C40 S. Gayen, N. V. Vinodchandran. New Algorithms for Distributed Sliding Windows. *Scandinavian Symposium and Workshops on Algorithm Theory 2018 (SWAT 2018)*, LIPIcs vol 101, pages 22:1–22:15.

C39 T. Spangler, N. V. Vinodchandran, A. Samal, J. R.Green. Fractal Features for Automatic Detection of Dysarthria. *IEEE International Conference on Biomedical & Health Informatics 2017, (IEEE-BHI 2017)*, pages 437–440.

C38 A. Pavan, P. Quint, S. D. Scott, N. V. Vinodchandran, J. Smith. Computing Triangle and Open-Wedge Heavy-Hitters in Large Networks. *International Conference on Big Data 2016 (IEEE BigData 2016)*, 998–1005.

C37 S. Gayen, N. V. Vinodchandran. Algorithms for k-median Clustering over Distributed Streams. *International Conference of Computing and Combinatorics 2016 (COCOON 2016)*, LNCS vol 9797, pages 535–546.

C36 P. Dixon, D. Mandal, A. Pavan, N. V. Vinodchandran. A Note on the Advice Complexity of Multipass Randomized Logspace. *International Symposium on Mathematical Foundations of Computer Science 2016 (MFCS 2016)*, pages 31:1–31:7.

C35 M. B. Cohen, A. Pavan, N. V. Vinodchandran. Budgeted Testing Through an Algorithmic Lens. *International Symposium on Foundations of Software Engineering 2016 (SIGSOFT FSE 2016)*, pages 948–951.

C34 P. Quint, S. Scott, N. V. Vinodchandran, and B. Worley. Constrained Group Testing to Predict Binding Response of Candidate Compounds. *Siam International Conference on Data Mining 2016 (SDM 2016)*, pages 756–764.

C33 V. Braverman, Z. Liu, T. Singh, N. V. Vinodchandran, and L. F. Yang. New Bounds for the CLIQUE-GAP Problem Using Graph Decomposition Theory. *International Symposium on Mathematical Foundations of Computer Science 2015 (MFCS 2015)*, LNCS vol 9235, pages 151–162.

C32 D. Mandal, A. Pavan, and N. V. Vinodchandran. On Probabilistic Space-Bounded Machines with Multiple Access to Random Tape. *International Symposium on Mathematical Foundations of Computer Science 2015 (MFCS 2015)*, LNCS vol 9235, pages 459–471.

C31 D. Chakraborty, A. Pavan, R. Tewari, N. V. Vinodchandran, and L. Yang. New Time-Space Upperbounds for Directed Reachability in High-Genus and H-Minor-Free Graphs. *Foundations of Software Technology and Theoretical Computer Science 2014 (FSTTCS 2014)*, LIPIcs vol 29, pages 585–595.

C30 T. Imai, K. Nakagawa, A. Pavan, N. V. Vinodchandran, and O. Watanabe. An $O(n^{1/2+\epsilon})$-Space and Polynomial-Time Algorithm for Directed Planar Reachability. *Conference on Computational Complexity 2013 (CCC 2013)*, pages 277-286.

C29 D. Stolee and N. V. Vinodchandran. Space-Efficient Algorithms for Reachability in Surface-Embedded Graphs. *Conference on Computational Complexity 2012 (CCC 2012)*, pages 326–333.

C28 B. Garvin, D. Stolee, R. Tewari, and N. V. Vinodchandran. ReachFewL = ReachUL. *International Computing and Combinatorics Conference 2011 (COCOON 2011)*, LNCS vol 6842, pages 252–258.

C27 S. Datta, R. Kulkarni, R. Tewari, and N. V. Vinodchandran. Space Complexity of Perfect Matching in Bounded Genus Bipartite Graphs. *International Symposium on Theoretical Aspects of Computer Science 2011 (STACS 2011)*, LIPIcs vol 9, pages 579–590.

C26 D. Stolee, C. Bourke, and N. V. Vinodchandran. A Log-Space Algorithm for Reachability in Planar Acyclic Diagraphs with Few Sources. *IEEE Conference on Computational Complexity 2010 (CCC 2010)*, pages 131–138.

C25 J. Hitchcock, A. Pavan, and N. V. Vinodchandran. Kolmogorov Complexity in Randomness Extraction. *International Conference on Foundations of Software Technology and Theoretical Computer Science 2009 (FSTTCS 2009)*, LIPIcs vol 4, pages 215–226.

C24 C. Bourke, R. Tewari, and N. V. Vinodchandran. Directed Planar Reachability is in Unambiguous Logspace. *IEEE Conference on Computational Complexity 2007 (CCC 2007)*, pages 217–221.

C23 A. Pavan, R. Santhanam, and N. V. Vinodchandran. Some Results on Average-Case Hardness within the Polynomial Hierarchy. *International Conference on Foundations of Software Technology and Theoretical Computer Science 2006 (FSTTCS 2006)*, LNCS vol: 4337, pages 188–199.

C22 L. Fortnow, J. Hitchcock, A. Pavan, N. V. Vinodchandran, and F. Wang. Extracting Kolmogorov Complexity with Applications to Dimension Zero-One Laws. *International Colloquium on Automata, Languages and Programming 2006 (ICALP 2006)*, LNCS vol: 3903, pages 335–345.

C21 K. Deng, C. Bourke, S. Scott, and N. V. Vinodchandran. New Algorithms for Optimizing Multi-class Classifiers via ROC Surfaces. *Proceedings of the Workshop on ROC Analysis in Machine Learning 2006*, pages 25–32.

C20 S. Despande, A. Todimala, R. K. Balachandran, B. Ramamurthy, X. Zou, and N. V. Vinodchandran. DH-SPDCS: A Scalable Scheme for Secure Dynamic Conferencing for Data Networks. *IEEE International Conference on Communication 2006 (ICC 2006)*, pages 2310–2315.

C19 Geng Hao, N. V. Vinodchandran, Byrav Ramamurthy, and Xukai Zou. A Balanced Key Tree Approach for Dynamic Secure Group Communication. *IEEE International Conference On Computer Communications And Networks 2005 (ICCCN 05)*, pages 345–350.

C18 A. Todimala, B. Ramamurthy, and N. V. Vinodchandran. Least Cost Disjoint Paths with Dependent Cost Structure in WDM Networks. *International Conference on Broadband Networks 2005 (BROADNET 2005)*, pages 145–154.

C17 A. Pavan and N. V. Vinodchandran. Relations between Average-Case and Worst-Case Complexity. *International Symposium Foundations of Computing Theory 2005 (FCT 2005)*. LNCS vol: 3623, pages 422–432.

C16 R. K. Balachandran, B. Ramamurthy, X. Zou, and N. V. Vinodchandran. CRTDH: An Efficient Key Agreement Scheme for Secure Group Communications in Wireless Ad-Hoc Networks. *IEEE International Conference on Communications 2005 (ICC 2005)*, Vol: 2, pages 1123– 1127.

C15 Q. Tao, S. Scott, N. V. Vinodchandran, T. T. Osugi, and B. Mueller. An Extended Kernel for Generalized Multiple-Instance Learning. *IEEE International Conference on Tools with Artificial Intelligence 2004 (ICTAI 2004)*, pages 272–277.

C14 N. V. Vinodchandran. Learning DNFs and Circuits Using Teaching Assistants. *Proceedings of the 10th International Computing and Combinatorics Conference 2004 (COCOON 04)*, LNCS vol: 3160, pages 188–197.

C13 Q. Tao, S. Scott, N. V. Vinodchandran, and T. T. Osugi. SVM-Based Generalized Multiple-Instance Learning via Approximate Box Counting. *Proceedings of the 21st International Conference on Machine Learning 2004 (ICML 2004)*, pages 799–806.

C12 J. M. Hitchcock and N. V. Vinodchandran. Dimension, Entropy Rates, and Circuit Complexity. *Proceedings of the 19th IEEE Conference on Computational Complexity 2004 (CCC 2004)*, pages 174–183.

C11 J. M. Hitchcock, A. Pavan, and N. V. Vinodchandran. Partial Bi-Immunity and NP-Completeness. *Proceedings of the 19th IEEE Conference on Computational Complexity 2004 (CCC 2004)*, pages 198–203.

C10 X. Zou, B. Ramamurthy, N. V. Vinodchandran, and R. K. Balachandran. Access Control Using a Unified Hierarchy Technique. *IASTED International Conference on Communications, Internet, & Information Technology, 2003.*

C09 L. Fortnow, L. Antunes, and N. V. Vinodchandran. Computational Depth vs Average Polynomial Time. *International Symposium on Fundamentals of Computation Theory 2003 (FCT 2003)*, Lecture Notes in Computer Science vol: 2751, pages 303–310.

C08 V. Arvind, K. V. Subrahmanyam, and N. V. Vinodchandran. Query Complexity of Program Checking by Constant-Depth Circuits. *International Symposium on Algorithms and Computation 1999 (ISAAC 99)*, Lecture Notes in Computer Science vol: 1741, pages 123–132.

C07 P. B. Miltersen and N. V. Vinodchandran. Derandomizing Arthur-Merlin Games using Hitting Sets. *Proceedings of the 40th Annual Symposium on Foundations of Computer Science 1999 (FOCS 1999)*, pages 71–80.

C06 P. B. Miltersen, N. V. Vinodchandran, and O. Watanabe. Superpolynomial versus Subexponential Circuit Size in the Exponential Hierarchy. *International Computing and Combinatorics Conference 1999 (COCOON 99)*, Lecture Notes in Computer Science vol: 1627, pages 210–220.

C05 N. V. Vinodchandran. Improved Lowness Results for Solvable Black-Box Group Problems. *International Conference on Foundations of Software Technology and Theoretical Computer Science 1997 (FSTTCS 97)*, Lecture Notes in Computer Science vol: 1346, pages 220–234.

C04 V. Arvind and N. V. Vinodchandran. Exact Learning via Teaching Assistants. *International Workshop on Algorithmic Learning Theory 1997 (ALT 97)*, Lecture Notes in Artificial Intelligence vol: 1316, pages 291–306.

C03 V. Arvind and N. V. Vinodchandran. The Complexity of Exactly Learning Algebraic Concepts. *International Workshop on Algorithmic Learning Theory 1996 (ALT 96)*, Lecture Notes in Artificial Intelligence vol: 1160, pages 100–112.

C02 V. Arvind and N. V. Vinodchandran. Solvable Black-Box Group Problems are low for PP. In *Symposium on Theoretical Aspects of Computer Science, 1996 (STACS 96)*, Lecture Notes in Computer Science vol: 1046, pages 99–110.

C01 N. V. Vinodchandran, K. Krithivasan, and M. Mahajan. On the Structure within Mod-classes. *National (India) Seminar on Theoretical Computer Science*, 1993, pages 151–161.

Peer Reviewed Journal Publications

J35 E. Baranov, S. Chakraborty, A. Legay, K. S. Meel, N. V. Vinodchandran. A Scalable t-wise Coverage Estimator. *IEEE Transaction on Software Engineering*, 50(8): 2021-2039 (2024)

J34 A. Pavan, N. V. Vinodchandran, A. Bhattacharyya, K. S. Meel. Model Counting Meets F_0 Estimation. *ACM Trans. Database Syst.* 48(3): 7:1-7:28 (2023)

J33 A. Pavan, N. V. Vinodchandran, A. Bhattacharyya, K. S. Meel. Model Counting Meets Distinct Elements. *Commun. ACM* 66(9): 95-102 (2023) (Research Highlight).

J32 A. Bhattacharyya, S. Gayen, E. Price, Vincent Y. F. Tan, N. V. Vinodchandran. Near-Optimal Learning of Tree-Structured Distributions by Chow-Liu. *SIAM Journal on Computing*, 52(3): 761–793 (2023).

J31 A. Pavan, N. V. Vinodchandran, A. Bhattacharyya, K. S. Meel. Model Counting Meets Distinct Elements in a Data Stream. *SIGMOD Records*, 51(1): 87–94 (2022) (Research Highlight).

J30 V. Braverman, Z. Liu, T. Singh, N. V. Vinodchandran, L. F. Yang. New Bounds for the CLIQUE-GAP Problem Using Graph Decomposition Theory. *Algorithmica*, 80(2): 652–667 (2018).

J29 N. V. Vinodchandran and M. Zimmand. On Optimal Language Compression for Sets in PSPACE/poly. *Theory of Computing Systems*, 56(3): 581–590 (2015).

J28 B. Garvin, D. Stolee, R. Tewari, and N. V. Vinodchandran. ReachFewL = ReachUL. *Computational Complexity*, 23(1): 83–98 (2014).

J27 A. Pavan, R. Tewari, and N. V. Vinodchandran. On the Power of Unambiguity in Logspace. *Computational Complexity*, 21(4): 643–670 (2012).

J26 R. Tewari, and N. V. Vinodchandran. Green's Theorem and Isolation in Planar Graphs. *Information and Computation*, 215: 1–7 (2012).

J25 S. Datta, R. Kulkarni, R. Tewari, and N. V. Vinodchandran. Space Complexity of Perfect Matching in Bounded Genus Bipartite Graphs. *Journal of Computer and System Sciences*, 78(3): 765–779 (2012)

J24 J. Hitchcock, A. Pavan, N. V. Vinodchandran. Kolmogorov Complexity in Randomness Extraction. *ACM Transactions on Computation Theory*, 3(1): (2011).

J23 L. Fortnow, J. Hitchcock, A. Pavan, N. V. Vinodchandran, and F. Wang. Extracting Kolmogorov Complexity with Applications to Dimension Zero-One Laws. *Information and Computation*, 209(4): 627–636 (2011).

J22 C. Bourke, R. Tewari, and N. V. Vinodchandran. Directed Planar Reachability is in Unambiguous Logspace. *ACM Transactions on Computation Theory*, 1(1): 4:1–4:17 (2009).

J21 R. K. Balachandran, X. Zou, B. Ramamurthy, A. Thukral, and N. V. Vinodchandran. An Efficient and Attack-Resistant Key Agreement Scheme for Secure Group Communications in Mobile Ad-Hoc Networks. *Wireless Communications in Mobile Ad-Hoc Networks*, 8(10): 1297–1312 (2008).

J20 A. Pavan and N. V. Vinodchandran. 2-Local Random Reduction to 3-Valued Functions. *Computational Complexity*, 17(4): 501–514 (2008).

J19 Q. Tao, S. Scott, N. V. Vinodchandran, T. T. Osugi, and B. Mueller. Kernels for Generalized Multiple-Instance Learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 30(12): 2084–2097 (2008).

J18 C. Bourke, K. Deng, R. E. Schapire, S. Scott, and N. V. Vinodchandran. On Reoptimizing Multi-Class Classifiers. *Machine Learning*, 71(2-3): 219–242 (2008).

J17 A. Pavan and N. V. Vinodchandran. Relations Between Average-Case and Worst-Case complexity. *Theory of Computing Systems*, 42(4): 596–607 (2008).

J16 J. M. Hitchcock, A. Pavan, and N. V. Vinodchandran. Partial Bi-immunity, Scaled Dimension, and NP-Completeness. *Theory of Computing Systems*, 42(2): 131–142 (2008).

J15 A. Pavan, S. Sengupta, A. Selman, and N. V. Vinodchandran. Polylogarithmic Round Interactive Proofs for coNP collapses the Exponential Hierarchy. *Theoretical Computer Science*, 385: 167–178 (2007).

J14 L. Antunes, L. Fortnow, D. van Melkebeek, and N. V. Vinodchandran Computational Depth: Concept and Applications. *Theoretical Computer Science*, 354(3): 391–404 (2006). 391–404. Special issue for selected papers from the conference *Fundamentals of Computation Theory* 2003.

J13 J. M. Hitchcock and N. V. Vinodchandran. Dimension, Entropy Rates, and Circuit Complexity. *Journal of Computer and System Sciences*, 72(4): 760–782 (2006).

J12 C. Bourke, J. M. Hitchcock, and N. V. Vinodchandran. Entropy Rates and Finite State Dimension. *Theoretical Computer Science*, 349: 392–406 (2005).

J11 N. V. Vinodchandran. Nondeterministic Circuit Minimization Problem and Derandomizing Arthur-Merlin Games. *International Journal on Foundations of Computer Science*, 16(6): 1297–1308 (2005).

J10 N. V. Vinodchandran. A Note on the Circuit Complexity of PP. *Theoretical Computer Science*, 347: 415–418 (2005).

J09 P. B. Miltersen and N. V. Vinodchandran. Derandomizing Arthur-Merlin Games using Hitting Sets. *Computational Complexity*, 14: 256–279 (2005).

J08 N. V. Vinodchandran. Counting Complexity of Solvable Black-Box Group Problems. *SIAM Journal on Computing*, 33(4): 852–869 (2004).

J07 N. V. Vinodchandran. $\mathrm{AM}_{\mathrm{exp}} \not\subseteq (\mathrm{NP} \cap \mathrm{CoNP})/\mathrm{poly}$. *Information Processing Letters*, 89: 43–47 (2004).

J06 V. Arvind, K. V. Subrahmanyam and N. V. Vinodchandran. Query Complexity of Program Checking by Constant-Depth Circuits. *Chicago Journal of Theoretical Computer Science*, Article 2, December 2002.

J05 V. Arvind and N. V. Vinodchandran. The Counting Complexity of Group-definable Languages. *Theoretical Computer Science*, 242: 199–218 (2000).

J04 V. Arvind and N. V. Vinodchandran. Exact Learning via Teaching Assistants. *Theoretical Computer Science*. Special issue devoted to the Seventh International Workshop on Algorithmic Learning Theory, 241: 51–81 (2000).

J03 V. Arvind and N. V. Vinodchandran. Solvable Black-Box Group Problems are low for PP. *Theoretical Computer Science*, 180: 17–47 (1997).

J02 M. Mahajan and N. V. Vinodchandran. A Note on Mod and Generalized Mod-classes. *Information Processing Letters*, 55(1): 27–31 (1995).

J01 M. Mahajan, T. Thierauf and N. V. Vinodchandran. A Note on the SpanP Functions. *Information Processing Letters*, 51: 7–10 (1994).

Surveys

S1 N. V. Vinodchandran. Space Complexity of Directed Reachability Problem over Surface-Embedded Graphs. *Perspectives in Computational Complexity*, The Somenath Biswas Anniversary Volume. vol: 26 of Progress in Computer Science and Applied Logic, pages 37–49.

Synergistic Activities

Invited Presentations

Satisfiability: Theory, Practice, and Beyond, Simons Institute workshop, April 17–21, 2023. Invited presentation "SAT Beyond Boolean Interpretations."

Complexity and Logic Workshop at IIT, Kanpur, August 17–19, 2012. Held in conjunction with Prof. Somenath Biswas's 60th birthday celebrations. Invited presentation "The Complexity of the Graph Reachability Problem."

Dagstuhl Workshop on Computability, Complexity and Randomness, Dagstuhl, Germany, Jan 8–13, 2012. Invited presentation "The Complexity of the Graph Reachability Problem."

Conference on Logic, Computability and Randomness, University of Notre Dame, May 24–28, 2010. Invited presentation "Green's Theorem and Isolation in Planar Graphs."

Dagstuhl workshop on Algebraic Methods in Complexity Theory, Dagstuhl, Germany, October 11–16, 2009. Invited presentation "Kolmogorov Complexity in Randomness Extraction."

Dagstuhl workshop on Algebraic Methods in Complexity Theory, Dagstuhl, Germany, October 7–12, 2007. Invited presentation "Directed Planar Reachability is in Unambiguous Logarithmic Space."

Several invited departmental colloquiums across the world.

Other Activities

Editor of journals: *Computability, Fundamenta Informaticae, ACM Transactions on Probabilistic Machine Learning.*

Program Committee Member: *Computing and Combinatorics Conference, 2018 (COCOON 2018).*

Session Chair: *40th International Conference on Mathematical Foundations of Computer Science, 2017 (MFCS 2017).*

Program Committee Member: Conference on *Computability, Complexity, and Randomness, 2015, (CCR 2015).*

Program Committee Member: International Conference on *Foundations of Software Technology and Theoretical Computer Science, 2007, (FSTTCS 07).*

Co-Organizer: *Randomness in Computation*, Special session in AMS Sectional Meeting October 2005.

Teaching and Mentoring

Courses Taught

Senior Design (CSCE 487-489), UNL.
Offerings: Fall 2024, Spring 2024, Fall 2023, Spring 2023, Fall 2022, Spring 2022, Fall 2021, Spring 2021, Fall 2020.
Seminar: Foundations of Machine Learning (CSCE 990), UNL.
Offerings: Spring 2019, Spring 2021.
Advances in Computational Complexity: Lecture Series (CS6290), School of Computing, National University of Singapore, Fall 2019, First 6 weeks term.
Foundations of Computer Science (RAIK 283H), UNL.
Offerings: Fall 2014, Fall 2013, Fall 2010, Fall 2009, Fall 2008, Fall 2007, Fall 2006, Fall 2005.
Average Evaluation: ∼4.4/5
Data structures and Algorithms (CSCE 310), UNL.
Offerings: Fall 2023, Fall 2022, Spring 2014, Spring 2013, Spring 2010, Fall 2006, Spring 2006, Spring 2005.
Average Evaluation: ∼4.3/5
Introduction to Computational Complexity Theory (CSCE 424/824), UNL.
Offerings: Spring 2018, Spring 2010, Spring 2008, Spring 2006, Fall 2003, Fall 2002.
Average Evaluation: ∼4.5/5
Design and Analysis of Algorithms (CSCE 423/823), UNL.
Offerings: Spring 2022, Fall 2018, Spring 2009, Spring 2005, Spring 2004, Spring 2002.
Average Evaluation: ∼4.0/5
Theory of Computation (CS 600.471), Johns Hopkins University.
Offerings: Fall 2012, Fall 2011.
Average Evaluation: ∼4.0/5
Introduction to Computing (CSCE 101), UNL.
Offerings: Spring 2011.
Averate Evaluation: ∼3/5.

Introduction to Discrete Structures (CSCE 235), UNL.
Offerings: Fall 2001.
Average Evaluation: ∼3.39/5.
Theory Seminar Series (CSCE 900), UNL.
Offerings: Fall 2018 (Deep Learning), Fall 2010 (Unique Games Conjecture), Fall 2009 (Concentration of Measures), Fall 2008 (Game Theory), Fall 2006 (Quantum Computation), Spring 2006 (Communication Complexity), Fall 2005 (Online Algorithms), Spring 2005 (Randomized Algorithms), Fall 2004 (Approximation Algorithms).
Other Courses: *Coding theory*, *Introduction to Quantum Computing*, *Advances in Computational Complexity*, *Algorithms for Large Data Sets*, *Pattern Recognition*.

Mentoring

Current Undergraduate REU: Drew Medina, Aden Hester.

PhD Students Graduated: Dr. Jason Vander Woude (Spring 2023 - jointly with J. Radcliffe) - Currently Senior Research Scientist, Sandia National Labs. Dr. Sutanu Gayen (Summer 2019) - Currently Assistant Professor, IIT Kanpur, India. Dr. Derrick Stolee (Spring 2012 - Jointly with Prof. S. Hartke, Dept. of Math., UNL) - Currently at GitHub. Dr. Raghunath Tewari (Spring 2011) - Currently Associate Professor at IIT Kanpur, India. Dr. Chris Bourke (Fall 2008) - Currently Associate Professor of Practice at the University of Nebraska–Lincoln.

MS Students Graduated: Chris Bourke (Fall 2004), Raghunath Tewari (Spring 2007), Taylor Spangler (Fall 2013), Rakesh Adloori (Spring 2016), Archit Srivastava (Summer 2022).

External Member, PhD Committee: Sambuddha Roy, State University of New Jersey, Rutgers.

Member, Board of Examiners, PhD thesis: Ajitha Shenoy, IIT Kanpur.