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## Academic and Research Positions

### *University of Nebraska-Lincoln*

Professor of Computer Science and Engineering.	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

### *National University of Singapore*

Visiting Professor of School of Computing.	July 2019 - Dec 2019
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### *Johns Hopkins University*

Visiting Associate Professor of Computer Science.	July 2011 - Aug 2013
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### *NEC Research Institute, Princeton*

Postdoctoral Research Scientist.	Oct 2000 - Aug 2001
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### *University of Aarhus, Denmark*

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

CACM Research Highlight (Invited).  
SIGMOD Research Highlights Award 2022.  
Best of PODS 2021.  
Student Choice Outstanding Teaching award, Dept CS&E, UNL 2016-2017.  
Susan Rosowski Professorship, Univ. of Nebraska-Lincoln 2010.  
Distinguished Teaching Award, College of Arts and Sciences, Univ. of Nebraska-Lincoln, 2005.

## Research Funding

*Collaborative Research:AF: Weak Derandomizations in Time and Space Complexity* (PI). NSF Algorithmic Foundations. UNL amount: \$271,995. Award Period: 10/01/2021 – 09/30/2024.

*HDR TRIPODS: D<sub>4</sub> (Dependable Data-Driven Discovery) Institute*. NSF. 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. 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. 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. UNL amount: \$57,560. Awarded Period: 03/26/2018 - 11/25/2018.

*Collaborative Research:AF:Small: Exploring New Approaches in Space-bounded Computation* (PI). NSF Algorithmic Foundations. 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. UNL amount: \$272,031. Award Period: 08/01/2009 – 07/31/2014.

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

*Studies in Computational Complexity Theory* (PI). NSF Theory of Computing. 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 amount \$349,990. Award Period: 08/01/2003 – 09/30/2007.

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

### UNL Funding

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

Big-12 Fellowship. Projects: *Program checkers for NP-complete problems* and *Complexity of Individual Sequences*. Total amount \$2500. Award Period: 07/01/2004 – 06/31/2005.

*Program Checking Infrastructure for Cyber Security Applications* (PI). Layman Award. Total amount \$10,000. Award Period: 05/1/ 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<sup>1</sup>

### Peer Reviewed Conference Publications

- C55 S. CHAKRABORTY, N. V. VINODCHANDRAN, K. S. MEEL. Distinct Elements in Streams: An Algorithm for the (Text) Book. *European Symposium on Algorithms (ESA 2022)*: 34:1-34:6.
- C54 P. DIXON, A. PAVAN, J. VANDER WOUDE, N. V. VINODCHANDRAN. Pseudodeterminism: Promises and Lowerbounds. *Symposium on Theory of Computing (STOC 2022)*: 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 (PODS 2022)*: 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 (AISTATS 2022)*: 7531-7549.
- C51 E. BARANOV, S. CHAKRABORTY, A. LEGAY, K. S. MEEL, N. V. VINODCHANDRAN. A Scalable t-wise Coverage Estimator. *International Conference on Software Engineering (ICSE 2022)*: 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 (STOC 2021)*. 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 (PODS 2021)*. 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 (PODS 2021)*. 299-311.
- Best of PODS 2021, 2022 SIGMOD Research Highlights Award and invited to CACM Research Highlight.**
- C47 A. BHATTACHARYYA, S. GAYEN, S. KANDASAMY, N. V. VINODCHANDRAN. Testing Product Distributions: A Closer Look. *Algorithmic Learning Theory (ALT 2021)*. 367-396.
- C46 P. DIXON, A. PAVAN, N. V. VINODCHANDRAN. Complete Problems for Multi-Pseudodeterministic Computations. *Innovations in Theoretical Computer Science (ITCS 2021)*: 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 (TCC 2020)*. Lecture Notes in Computer Science, vol 12550, TCC (1) 2020: 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 33 (NeurIPS 2020)*.

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<sup>1</sup>Listing authors in alphabetical order is the standard in foundational computer science journals and conferences. As it is difficult to separate contributions by percentage in foundational topics, the authors share the credit equally.

- 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 (ICML 2020)*, PMLR 119:842-853, 2020.
- C42 SAIRAM BEHERA, SUTANU GAYEN, JITENDER S. DEOGUN, N. V. VINODCHANDRAN. Kmer-Estimate: 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)*, 438–447.
- C41 PETER DIXON, ADURI 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 SUTANU 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 TAYLOR SPANGLER, N. V. VINODCHANDRAN, ASHOK SAMAL, JORDAN R. GREEN. Fractal features for automatic detection of dysarthria. *IEEE International Conference on Biomedical & Health Informatics, 2017, (IEEE-BHI 2017)*, pages 437-440.
- C38 ADURI PAVAN, PAUL QUINT, STEPHEN 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 SUTANU GAYEN, N. V. VINODCHANDRAN. Algorithms for k-median Clustering over Distributed Streams. *International Conference of Computing and Combinatorics, 2016 (COCON 2016)*, LNCS vol 9797, pages 535-546.
- C36 PETER DIXON, DEBASIS MANDAL, ADURI 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 MYRA B. COHEN, ADURI 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, STEPHEN 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. *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. *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. *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. *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. *International Conference On Computer Communications And Networks, 2005, (ICCCN 05)*, pages 345-350.
- C18 AJAY TODIMALA, BYRAV 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. *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. *International Conference on Tools with Artificial Intelligence, 2004 (ICTAI 2004)*, pages 272-277.
- C14 N. V. VINODCHANDRAN. Learning DNFs and Circuits using Teaching Assistants. *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. *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. *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. *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. *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. In *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, KAMALA KRITHIVASAN, AND MEENA MAHAJAN. On the Structure within Mod-classes. In *National (India) Seminar on Theoretical Computer Science*, pages 151–161, 1993.

### Peer Reviewed Journal Publications

- J30 VLADIMIR BRAVERMAN, ZAOXING LIU, TEJASVAM SINGH, N. V. VINODCHANDRAN, LIN F. YANG. New Bounds for the CLIQUE-GAP Problem Using Graph Decomposition Theory. *Algorithmica* 80(2): 652–667 (2018).
- J29 N. V. VINODCHANDRAN AND MARIUS 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): 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 03*.
- 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.  $AM_{\text{exp}} \not\subseteq (NP \cap \text{CoNP})/\text{poly}$ . *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. Electronic journal: *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. In *Perspectives in Computational Complexity*, The Somenath Biswas Anniversary Volume. Ed. M. Agrawal and V. Arvind. Vol: 26 of Progress in Computer Science and Applied Logic, pages 37–49.

## Synergistic Activities

### Invited presentations

- Departmental Colloquium at Department of Computer Science, Indian Institute of Palakkat, Kerala, August 8, 2018. Presentation “Testing Distributions for Uniformity.”
- Departmental Colloquium at Department of Statistics, UNL, October 26, 2017. Presentation “Testing Distributions.”
- Departmental Colloquium at Department of Mathematics, UNL, Dec 2nd, 2016. Presentation “On the Space Complexity of The Graph Reachability Problem.”
- Complexity and Logic workshop at IIT, Kanpur*, August 17-19, 2012. Held in conjunction with Prof. Somenath Biswas’s 60th birthday celebrations. Presentation “The Complexity of the Graph Reachability Problem.”
- Departmental Colloquium at the National Institute of Technology, Calicut, Kerala, India, July 20th, 2012. Presentation “The Complexity of the Graph Reachability Problem.”
- Departmental Colloquium at the Institute of Mathematical Sciences, Chennai, India, July 12th, 2012. Presentation “The Complexity of the Graph Reachability Problem.”
- Dagstuhl workshop on *Computability, Complexity and Randomness* Dagstuhl, Germany, from Jan 8 - 13, 2012. Invited Presentation “The Complexity of the Graph Reachability Problem.”
- Departmental Colloquium at Johns Hopkins University, Baltimore, Feb 17, 2011. Presentation “On the Complexity of the Graph Reachability Problem.”
- Conference on Logic, Computability and Randomness*, University of Notre Dame, from may 24 - 28, 2010. Invited Presentation “Green’s Theorem and Isolation in Planar Graphs.”
- Dagstuhl workshop on *Algebraic Methods in Complexity Theory* Dagstuhl, Germany, from October 11 - 16, 2009. Invited Presentation “Kolmogorov Complexity in Randomness Extraction.”
- Dagstuhl workshop on *Algebraic Methods in Complexity Theory* Dagstuhl, Germany, from October 7 - 12, 2007. Invited Presentation “Directed Planar Reachability is in unambiguous logarithmic space.”
- Departmental Colloquium at College of Computer and Information Science, Northeastern University, Boston, USA. May 6-7, 2007. Presentation “On the Space Complexity of Directed Planar Reachability.”
- Departmental Colloquium at Department of Computer Science, Aarhus University, Denmark, from May 10-27, 2004. Presentation “Separating NP-completeness using Partial Bi-immunity.”

School of MPCE, Maquarie University, Sydney, from October 28-31, 1996. Presentation “Solvable Group problems are Low for PP” on October 30th, 1996.

School of Computer Science and Engineering, University of New South Wales, Sydney on November 1st, 1996. Presentation “Complexity of Computational Problems over Finite Groups”.

Department of Computer Science, Tokyo Institute of Technology, Tokyo, Japan, from September 29-October 3, 1997. Presentation “Complexity of Solvable Black-box group problems” in the Workshop on Complexity Theory on September 30th, 1997.

## Other Activities

Editor, Journal *Fundamenta Informaticae*.

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.

Co-organizer *Atlantic Theory Seminar series*, a joint Iowa State University - University of Nebraska seminar on computational complexity, algorithmic information, and learning.

Co-organizer and Track chair, *5th (2002), 6th (2003), and 7th (2004) Annual Regional Workshop in the Mathematical Sciences*, University of Nebraska-Lincoln.

## Teaching and Mentoring

### Courses Taught

*Senior Design* (CSCE 487-489), UNL

Offerings: 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:  $\sim 4.4/5$

*Data structures and Algorithms* (CSCE 310), UNL.

Offerings: Fall 2022, Spring 2014, Spring 2013, Spring 2010, Fall 2006, Spring 2006, Spring 2005.

Average Evaluation:  $\sim 4.3/5$

*Introduction to Computational Complexity Theory* (CSCE 424/824), UNL.

Offerings: Spring 2018, Spring 2010, Spring 2008, Spring 2006, Fall 2003, Fall 2002.

Average Evaluation:  $\sim 4.5/5$

*Design and Analysis of Algorithms* (CSCE 423/823), UNL.

Offerings: Spring 2022, Fall 2017, Spring 2009, Spring 2005, Spring 2004, Spring 2002.

Average Evaluation:  $\sim 4.0/5$

*Theory of Computation* (CS 600.471), Johns Hopkins University.

Offerings: Fall 2012, Fall 2011.

Average Evaluation:  $\sim 4.0/5$

*Introduction to Computing* (CSCE 101), UNL.

Offerings: Spring 2011.

Average Evaluation:  $3/5$ .

*Introduction to Discrete Structures* (CSCE 235), UNL.

Offering: 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 PhD Students: Jason Vander Woude.

Current Undergraduate REU: Alex Fetzner

PhD Students Graduated: Dr. Sutanu Gayen (Summer 2019) - Currently Assistant Professor, IIT Kanpur, India. Dr. Derrick Stolee (Spring 2012 - Jointly with Prof. Stephen Hartke, Dept of Math., UNL) Currently at Microsoft. 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.