



Jay S. Bagga, Ph. D.
Curriculum Vita
April 2023

CURRENT POSITION AND CONTACT INFORMATION	Professor of Computer Science Co-Director, Voting System Technical Oversight Program (VSTOP) Department of Computer Science Ball State University Muncie, Indiana jbagg@bsu.edu
RESEARCH EXPERTISE AND INTERESTS	Graph Theory, Graph Algorithms, and their Applications to Computer Science and other areas; Cybersecurity and Cryptography; Theory of Computation; Combinatorics and Discrete Structures; Technology of Elections; Software Verification and Model Checking; Bioinformatics.
EDUCATION	Ball State University , Muncie, Indiana M.S., Computer Science , 1988 Purdue University , W. Lafayette, Indiana Ph.D., Mathematics - Graph Theory , 1984 M.S., Mathematics 1977
PROFESSIONAL EXPERIENCE	Professor of Computer Science 1992 to present Department of Computer Science, Ball State University As a Professor of Computer Science, I teach graduate and undergraduate classes in Computer Security and Cryptography, Theory of Computation, Graph Algorithms, Programming, Discrete Structures, Data Structures, Complexity, and Algorithm Design. I have research expertise in Graph Theory, Graph Algorithms, Computational Geometry, Bioinformatics, and Technology of Elections. I have collaborated in research with students and research scholars from many universities in US and abroad. I have directed several doctoral and masters theses and dissertations. I have been awarded several Federal, State, University, and Industry research grants. I have organized national and international professional conferences. I have directed several exchange programs between Ball State University and international institutions. I have served as Editor or Referee of many national and international professional journals and conference proceedings.

Co-Director, Voting System Technical Oversight Program 2007 to present
Bowen Center for Public Affairs
Ball State University

As a Co-Director of the Voting System Technical Oversight Program (VSTOP) for the State of Indiana, I direct and coordinate activities related to the certification and testing of election equipment (including electronic voting systems and electronic poll books). I also manage the development of procedures and standards for the certification, acquisition, functioning, training, and security for electronic poll books used to conduct elections in Indiana. I work with state and federal agencies such as the Indiana Election Division, the Indian Election Commission and the US Election Assistance Commission to monitor compliance of state and federal standards for election equipment used in Indiana.

The VSTOP team advises the Indiana Secretary of State and the Indiana Election Commission on the certification of voting machines and electronic poll books in Indiana.

VSTOP helped pioneer first-in-the-nation legislation authorizing the certification and testing of electronic poll books before they are permitted to be used in elections in Indiana. The project also entails the creation of a database containing all voting machines used in Indiana as well as a report on the best practices of poll worker training.

Visiting Professor of Mathematics January 2015 to May 2015
Department of Mathematical Sciences
Indiana Purdue University Fort Wayne

I continued my work with VSTOP as a Co-Director. Taught an undergraduate class in Combinatorics and Discrete Mathematics. Conducted research in Graph Algorithms. Worked on co-authoring a book in Graph Theory.

Visiting Professor of Mathematics January 2009 to May 2009
Department of Mathematical Sciences
Texas State University

I continued my work with VSTOP as a Co-Director. Taught a graduate class in Graph Theory. Conducted research in Graph Algorithms.

**Director of United Nations University-International Institute
for Software Technology Exchange Program with
Ball State University** 2003 to 2006

I organized, hosted and directed the research of visiting scholars from several countries to Ball State University.

**Senior Fulbright Scholar and
Visiting Professor of Computer Science** January 2000 to December 2000
Department of Computer Science
University of Zimbabwe

Taught classes in Computer Science. Organized an International Conference in Graph Theory. Conducted research in Graph Algorithms.

Associate Professor of Computer Science 1989 to 1992
 Department of Computer Science
 Ball State University

Taught graduate and undergraduate classes in Graph Algorithms, Programming, Discrete Structures and Data Structures and Algorithm Design and Complexity. Conducted research in Graph Theory and Graph Algorithms. Collaborated in research with students and research scholars from many universities in US and abroad. I have been awarded several research grants from Federal, State, Universities, and Industry.

Associate Professor of Mathematics 1988 to 1989
 Department of Mathematical Sciences
 Purdue University Fort Wayne

Taught classes in Mathematics and conducted research in Graph Theory.

Assistant Professor of Mathematics 1984 to 1988
 Department of Mathematical Sciences
 Purdue University Fort Wayne

Taught classes in Mathematics and conducted research in Graph Theory.

- PERSONAL HONORS & AWARDS
- Mira TechPoint Technology in Education Excellence & Innovation Finalist 2012
 - Ball State Summer Commencement Speaker 2012
 - Ball State Outstanding Faculty Award 2010
 - Third Harary Memorial Lecture Speaker, Department of Computer Science, New Mexico State University 2009
 - Harary Plenary Lecture Speaker, MIGHTY (Midwest Graph Theory Conference), Indiana University Purdue University Fort Wayne 2006
 - Ball State Outstanding Research Award 2002
 - Fulbright Senior Scholar and Visiting Professor, University of Zimbabwe 2000
 - Foundation Fellow of the Institute of Combinatorics & its Applications 1992

- VSTOP HONORS & AWARDS
- 2021 Clearinghouse Award winner:
Outstanding Innovations in Elections – Large Jurisdictions. 2022
 - 2021 Clearie Honorable Mention
Outstanding Use of Help America Vote Act (HAVA) Grants in Election Modernization. 2022

- FUNDED GRANTS
- Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State 2023 to 2025 (in-process)
 - Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State 2021 to 2023
 - Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State 2019 to 2021
 - Voting Systems Technical Oversight Program (VSTOP),

Indiana Secretary of State	2017 to 2019
• Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State	2015 to 2017
• Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State	2013 to 2015
• Vietnam Educational Foundation U. S. Faculty Scholar Program Grant	2014 to 2015
• Vietnam Educational Foundation U. S. Faculty Scholar Program Grant	2012 to 2013
• US Election Assistance Commission (EAC Grant), Post Election Audit and Logic and Accuracy Initiative	2011 to 2013
• Ball State University ASPiRE Grant	2011 to 2012
• Vietnam Educational Foundation U. S. Faculty Scholar Program Grant	2011 to 2012
• Mobile Devices as Emerging Educational Tools,” Emerging Media Initiative Grant, Ball State University	2009 to 2010
• Biocomputational Immersive Learning, Ball State Enhanced Provost Initiative Grant	2009 to 2010
• Voting Systems Technical Oversight Program (VSTOP), Indiana Secretary of State	2008 to 2012
• International Programs Endowment Fund, Ball State University,	2008 to 2009
• Curriculum Development for “Careers in Homeland Security” Funded by Indiana Department of Homeland Security	2008
• “Science Literacy Project,” Department of Energy	2006 to 2008
• SERC (Software Engineering Research Center) and City Machine Tools and Die Grant	2002
• Ball State University Summer Research Grant	2002
• Ball State University Provost Initiative Grant	2001
• Ball State University Office of Research Grant	2000
• U. S. Department of State Fulbright Grant	
• United Nations University - International Institute of Software Technology Grant	2000
• Ball State University International Exchange Visitors Grant	1999 to 2000
• Central States Universities Incorporated Grant	1998
• U. S. Office of Naval Research (ONR) Grant	1994 to 1997
• Ball State University Summer Research Grant	1994
• Graph Note-Cards Software Development, Venue Corporation (California) Grant	1993 to 1995
• Cardinal Quest, Ball State Provost’s Green for Green Grant	1993
• U. S. Office of Naval Research (ONR) Grant	1991 to 1994
• Ball State University Summer Research Grant	1990
• U. S. Office of Naval Research (ONR) Grant	1986 to 1989
• Indiana University-Purdue University Summer Research Grant	1990

SELECTED
PROFESSIONAL
PRESENTATIONS IN
ELECTIONS
TECHNOLOGY

Since 2011, election administrators, voting system certification specialists, testing laboratory professionals, and members of the U.S. Election Assistance Commission

have gathered annually at the *State Certification Testing of Voting Systems National Conference* to discuss ways to improve the reliability of voting systems in order to uphold the integrity of the vote for the American electorate. The first (2011) conference was hosted by Center for Election Systems at Kennesaw State University. In 2012, VSTOP hosted the conference in Indianapolis where election officials were greeted by the Indiana Secretary of State. Other locations where conferences have occurred include Harrisburg, Pennsylvania (2013); Denver, Colorado (2014); Seattle, Washington (2015); Cambridge, Massachusetts (2016); and Austin, Texas (2017).

As a Co-Director of the VSTOP, I have worked with a committee that organizes the State Certification Testing of Voting Systems National Conferences. I have also made the following presentations (jointly with VSTOP Co-Directors) on our research:

- Straight Party Voting and Down Ballot Outcomes: The Impact of Indiana’s Public Law 21-2016 2017
- Evaluating the Performance of Electronic Poll Books: A National Survey 2016
- Electronic Poll Book Certification: Lessons Learned - Pitfalls, Perils, and Best Practices 2015
- Designing and Conducting an Audit of an Election Anomaly 2014
- E-Poll Books: The Next Certification Frontier 2013
- Generalized Protocol for Certifying E-Voting Systems 2012
- ECOs and State Certification Protocols - The Indiana Experience 2011

BOOKS/BOOK
CHAPTERS

1. Chapter *Disruptive Innovations in Voting: Electronic Poll Book Adoption and Certification in Indiana* couthored with Chad Kinsella and Bryan Byers, in the book **Government Response to Disruptive Innovation: Perspectives and Examinations**, Editors: Sam B. Edwards, III and James R. Masterson , Projected publication date: March, 2023, IGI Global Publishers, ISBN13: 9781668464298.
2. **Line Graphs and Line Digraphs**, couthored with Lowell W. Beineke, Springer, 2021, <https://doi.org/10.1007/978-3-030-81386-4>
3. **Theoretical Computer Science and Discrete Mathematics**, First International Conference, ICTCSDM 2016, 2017, co-edited with S. Arumugam, Lowell W. Beineke, and B.S. Panda. <https://doi.org/10.1007/978-3-319-64419-6>

DOCTORAL/
MASTERS
THESIS ADVISOR/
COMMITTEE
MEMBER /
THESIS EXAMINER

- (Ph.D Committee Member) Jessica Weir: *Big Data for the Benefit of Aquatic Invasive Species Management*, Ball State University (2023).
- (Ph.D Thesis Examiner) Neeta Shinde: *Graph Theoretical Aspects in Coding Theory*, University of Pune, India (2022).
- (Ph.D Advisor) Pambe Junior: *Labeling Problems in Graphs*, University of Cameroon (2017).
- (MS Advisor) Iman Hussein *Algorithms for Drawing Trees*, Ball State University (2017).
- (MS Advisor) Sujana Pradhan: *Design and Implementation of an Electronic Poll Book Solution*, Ball State University, 2014.

- (Ed.D. Advisor) Adrian Heinz: *Algorithms and Software Systems for Learning and Research*, Ball State University (2009).
- (PhD. Thesis Examiner) C. Sivagananam: *Studies in Graph Theory – Neighbor Connected and Neighborhood Total Domination in Graphs*, Annamalai University, India (2008).
- (Ph.D. Thesis Examiner) R. Lakshmi: *Contributions to the Theory of Optimal Orientations of Graphs*, Annamalai University, India (2006).
- (Ed.D. Advisor) Brian Simmons, Computer Science Cognate, Ball State University (1996).
- Between 1989 and 2017 I directed over thirty Masters Theses in Computer Science at Ball State University.

TEACHING
EXPERIENCE

- Network and Computer Security
- Design and Analysis of Algorithms
- Graph Theory and Graph Algorithms with Applications
- Research Methods in Computer Science
- Theory of Computation
- Advanced Theory of Computation
- Model Checking
- Applied Computational Geometry
- Bioinformatics Algorithms
- Discrete Structures
- Data Structures
- Combinatorics and Discrete Mathematics
- Computer Science 1 and 2
- Calculus 1 and 2
- Finite Mathematics
- Number Theory
- Statistics

EXPERIENCE AND
EXPERTISE IN
PROGRAM AND
COURSE
DEVELOPMENT

- Online Masters Program in Computer Science at Ball State University.
- Masters Program in Computer Science at Ball State University.
- Masters Program in Computer Science at University of Hanoi.
- Masters Program in Computer Science at University of Zimbabwe.
- New courses developed and taught at Ball State University and other institutions:
 - Topics in Cryptography and Cybersecurity.
 - Research Methods in Computer Science.
 - Theory of Computation 1 and Theory of Computation 2.
 - Graph Theory, Graph Algorithms, and Applications.
 - Advanced Topics in Graph Theory.
 - Software Verification and Model Checking.
 - Bioinformatics Algorithms.
 - Discrete Structures.
 - Design and Analysis of Algorithms.

- Applied Computational Geometry.
- Combinatorics and Discrete Mathematics.

1. Big data from a popular app reveals that fishing creates superhighways for aquatic invaders, with Jessica L Weir, Kirsten Vacuraa, Adam Berland, Kieran Hyder, Christian Skov, Johan Attbyg, and Paul A Venturelli, PNAS Nexus, 2022, 1, 1–9, <https://doi.org/10.1093/pnasnexus/pgac075>
2. New results and open problems in line graphs, with Lowell W. Beineke, AKCE International Journal of Graphs and Combinatorics, 2022, <https://doi.org/10.1080/09728600.2022.2093146>
3. A survey of line digraphs and generalizations, Jay S. Bagga and Lowell W. Beineke, Discrete Math. Lett. 6 (2021) 68–83, <https://doi.org/10.47443/dml.2021.s109>
4. Graphoidal graphs and graphoidal digraphs: a generalization of line graphs, with S. Arumugam, AKCE International Journal of Graphs and Combinatorics, 2020.
5. A survey and a new class of graceful unicyclic graphs, with Max Pambe Biatch', S. Arumugam, AKCE International Journal of Graphs and Combinatorics, 2020.
6. Discovery of Some New Classes of Graceful Unicyclic Graphs, with L. Fotso and Max Pambe, Journal of Combinatorial Mathematics and Combinatorial Computing, Volume 109, 2019, 105-127.
7. A number theoretic problem on super line graphs, Jay Bagga, Lowell Beineke and Badri Varma, AKCE International Journal of Graphs and Combinatorics, Volume 13, Issue 2, August 2016, Pages 177-190.
8. *New Classes of Graceful Unicyclic Graphs*, Electronic Notes in Discrete Mathematics 48 (2015) 27-32. (with Laure Pauline Fotso, Pambe Biatch' Max, S. Arumugam).
9. *Network Motif Identification and Structure Detection with Exponential Random Graph Models*, Network Biology, 2014, 4(4): 155-169.
10. *An Algorithm for graceful labelings of certain unicyclic graphs*, VNU Journal of Science: Comp. Science & Com. Eng. Vol. 30, No. 3 (2014) 1–11 (with Pambe Biatch' Max and Laure Pauline Fotso).
11. *On Dominator Colorings in Graphs*, Springer, Proceedings Mathematical Sciences, 10.1007/s12044-012-0092-5, 2012 (with S. Arumugam and K. Raja Chandrasekar).
12. *Graphical Modeling for High Dimensional Data*, Journal of Modern Applied Statistical Methods, 2012, Vol. 11, No. 2, (with M. Begum and A. Blakey)
13. *Graceful Labelings - Properties and Algorithms*, Graph Theory Research Directions, pp. 49-58, 2011, Narosa Publishing House, India.
14. *The Spectra of Super Line Multigraphs*, Proc. ICDM, RMS-Lecture Notes Series No. 13, 2010, pp. 81–89. (with R. Ellis and D. Ferrero).
15. *Software Systems for Research in Graph Theory*, The Journal of Combinatorial Mathematics and Combinatorial Computing, vol. LXIX, May 2009, pp 53-62. (with A. Heinz).

16. *Degree Sets in Polygon Visibility Graphs*, The Journal of Combinatorial Mathematics and Combinatorial Computing, vol. LXIX, May 2009, pp 63-74. (with John Emert, J. Michael McGrew, and Frank W. Owens).
17. *An Algorithm for Graceful Labelings of Cycles*, Congressus Numerantium 186 (2007), pp-57-63. (with Adrian Heinz and Mahbubul Majumder)
18. *Properties of Graceful Labelings of Cycles*, Congressus Numerantium 188 (2007), pp 109-1115. (with Adrian Heinz and Mahbubul Majumder)
19. *Software Systems for Implementing Graph Algorithms for Learning and Research*, ICTACS 2006, Proceedings of the First International Conference on Theories and Applications of Computer Science 2006, World Scientific Publishers. (with Adrian Heinz).
20. *On Avoiding a Clash of Arms at a Round Table*, Congressus Numerantium, 179 (2006), pp. 215-219. (with John Emert, J. Michael McGrew, and Frank W. Owens).
21. *The structure of super line graphs*, Proceedings, 8th International Symposium on Parallel Architectures, Algorithms & Networks (I-SPAN 2005), pp 468-471. IEEE Computer Society. (with Daniela Ferrero).
22. *The structure of super line graphs*, Proceedings, 8th International Symposium on Parallel Architectures, Algorithms & Networks (I-SPAN 2005), pp 468-471. IEEE Computer Society. (with D. Ferrero).
23. *Old and New Generalizations of Line Graphs*, International Journal of Mathematics and Mathematical Sciences 2004: 29, 1509-1521.
24. *Connectivity Properties of Visibility Graphs*, Congressus Numerantium, 165 (2003), pp. 189-194. (with John Emert and M. McGrew).
25. *A Cluster-Oriented Mutual Exclusion Algorithm for Mobile Ad-hoc Networks*, Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications, Volume II, CSREA Press, 2003. (with S. Udgate).
26. *JGraph - A Java Based System for Drawing Graphs and Running Graph Algorithms*, Lecture Notes in Computer Science, 2265 (2002), Springer Verlag. (with A. Heinz).
27. *Directed Polygons as Boundaries of Visibility Graphs*, Congressus Numerantium, 142 (2000), pp. 57-63. (with John Emert and M. McGrew).
28. *Hamiltonian Properties in Bipartite Graphs*, Bulletin of the Institute of Combinatorics and its Applications, 26 (1999). (with B. Varma).
29. *Independence and Cycles in Superline Graphs*, Australasian Journal of Combinatorics, 19 (1999). (with L. Beineke and B. Varma).
30. *The Super Line Graph L_2* , Discrete Mathematics, 206 (1999) (with L. Beineke and B. Varma).
31. *Directed Polygons Visibility Graphs*, Congressus Numerantium, vol. 132, (1998), pp. 61-67. (With John Emert and M. McGrew).

32. *The Complexity of Illuminating Polygons by a- floodlights*, International Informatics Series 5, Canadian Conference on Computational Geometry, 1996. (with L. Gewali and D. Glasser).
33. *Illuminating Simple Polygons by Floodlights*, Vision Geometry IV, The International Society for Optical Engineering, 1995. (with L. Gewali and D. Glasser)
34. *The Line Completion Number of a Graph*, Graph Theory, Combinatorics, and Algorithms, John Wiley, 1995. (with L. Beineke and B. Varma),
35. *Super Line Graphs*, Graph Theory, Combinatorics, and Algorithms, John Wiley, 1995. (with L. Beineke and B. Varma).
36. *On the Pure Edge Integrity of Graphs*, Graph Theory, Combinatorics, and Algorithms, John Wiley, 1995. (with J. Deogun).
37. *Edge Integrity - A Survey*, Discrete Applied Math, vol. 124(1994), pp 3-12. (with L. Beineke, M. Lipman, and R. Pippert).
38. *On the Sizes of Some Visibility Graphs*, Congressus Numerantium vol. 104, 1994, pp 25-32. (with J. Emert, M. McGrew, and W. Toll).
39. *Vertex Transitive Graphs of Toughness One*, The Bulletin of ICA, 10, 39-49, 1994. (with M. Lipman).
40. *Super Line Graphs and Their Properties*, in Proceedings of the Third China-USA International Graph Theory Conference, Beijing, 1993. (with L. Beineke and B. Varma).
41. *The Super Line Graph L_2 for Hypercubes*, Congressus Numerantium, vol. 93, 1993, pp 111-113. (with Maria Rosario Vasquez).
42. *On the Size of Minimal Visibility Graphs*, Department of Mathematical Sciences Technical Report #87, Ball State University, 1993. (with M. McGrew, J. Emert, and W. Toll).
43. *Some Bounds and An Algorithm for the Edge Integrity of Trees*, Ars Combinatoria, 35-A, pp 225-238, 1993. (with L. Beineke, M. Lipman, and R. Pippert, and R. L. Sedlmeyer).
44. *A Classification Scheme for Vulnerability and Reliability Parameters of Graphs*, Mathematical and Computer Modeling, 17/11, 1993, pp13-16. (with L. Beineke, M. Lipman, and R. Pippert).
45. *On the Honesty of Graph Complements*, Discrete Math, 122, pp 1-6, 1993. (with L. Beineke, M. Lipman, and R. Pippert).
46. *A Survey of Integrity*, Discrete Applied Mathematics, vol. 37-38, 1992, pp 13-28. (with L. Beineke, M. Lipman, and R. Pippert).
47. *Two Problems on Coloring Tournaments*, Vishwa International Journal of Graph Theory, vol. 1, December 1992. (with L. Beineke and F. Harary).
48. *A Variation on the Edge-Integrity*, Congressus Numerantium, vol. 91, 1992, pp207-211. (with J. Deogun).

49. *Degree Conditions and Long Cycles in Bipartite Graphs*, Congressus Numerantium, vol. 85, 1991, pp 123-128. (with B. Varma).
50. *Some Graph Theoretic Properties of Petri Nets*, Graph Theory, Combinatorics, and Applications, vol. 1, pp 19-28, John Wiley & Sons, 1991. (with F. Owens).
51. *Extensions of an Algorithm for Computing the Edge Integrity of Trees*, Graph Theory, Combinatorics, and Applications, vol. 1, pp 41-54, John Wiley & Sons, 1991. (with L. Beineke, M. Lipman, R. Pippert).
52. *Petri Nets, State Machines and Deadlocks*, ACM Nineteenth Annual Computer Science Conference, March 1991. (Abstract) (with F. Owens).
53. *Bipartite Graphs and Degree Conditions*, Graph Theory, Combinatorics, Algorithms, and Applications vol. 54, SIAM, 1991. (with B. Varma).
54. *The Concept of Leverage in Network Vulnerability*, Graph Theory, Combinatorics, and Applications, vol. 1, pp 29-40, John Wiley & Sons, 1991. (with L. Beineke, M. Lipman, R. Pippert).
55. *Explorations into Graph Vulnerability*, Graph Theory, Combinatorics, and Applications, vol. 1, pp 143-158, John Wiley & Sons, 1991. (with L. Beineke, M. Lipman, R. Pippert).
56. *Low Dimensional Middle Cubes are Hamiltonian*, Computing in the 90's, Lecture Notes in Computer Science #507, pp8-14, Springer Verlag, 1990. (with F. Owens).
57. *On Some Classes of Petri Nets*, ACM Eighteenth Annual Computer Science Conference, February 1990. (Abstract) (with F. Owens).
58. *On the Numbers of Some Subtournaments of a Bipartite Tournament*, Annals of the New York Academy of Sciences, vol. 555, 1989. (with L. W. Beineke).
59. *On Superstrong Tournaments and Their Scores*, Annals of the New York Academy of Sciences, vol. 555, 1989. (with L. W. Beineke).
60. *Deadlocks and Traps in Complete Petri Nets*, ACM Seventeenth Annual Computer Science Conference, February 1989. (Abstract) (with F. Owens).
61. *A Good Algorithm for the Computation of the Edge-Integrity of Trees*, Congressus Numerantium, vol. 67, 1988, pp 225-232 (with L.W. Beineke, M.J. Lipman , R.E. Pippert , and R.L. Sedlmeyer).
62. *The Separation Sequence and Network Reliability*, Congressus Numerantium, vol. 66 , 1988, pp 293-300 (with L.W. Beineke, M.J. Lipman , R.E. Pippert).
63. *Variations on a Theorem of Petersen*, Periodica Mathematica Hungarica, vol. 19(3), 1988, pp. 241-247. (with L.W. Beineke, G. Chartrand, and O.R. Oellermann).
64. *On the Edge Integrity of Graphs*, Congressus Numerantium; vol. 60, 1987, pp. 141-144. (with L.W. Beineke, M.J. Lipman , R.E. Pippert).
65. *On Superstrong Bipartite Tournaments*, Congressus Numerantium, vol. 53, 1987, pp. 113-119. (with L. W. Beineke)
66. *Uniquely Realizable Score Lists in Bipartite Tournaments*, Czechoslovak Mathematical Journal, vol. 37, no. 112, 1987, pp. 323-333. (with L. W. Beineke).
67. *Some Results on Binary Matrices Obtained via Bipartite Tournaments*, in Graph Theory and its Applications to Algorithms and Computer Science, John Wiley & Sons, 1985, pp. 47-56. (with L. W. Beineke).

68. *On Upsets in Bipartite Tournaments*, in Graph Theory and its Applications to Algorithms and Computer Science, John Wiley & Sons, 1985, pp. 37-46.

RECENT
NATIONAL,
INTERNATIONAL,
INVITED, AND
OTHER
PRESENTATIONS

1. Two invited presentations *Algorithms, Complexity and Applications to Graph Algorithms* and (jointly with Lowell Beineke) *Some Recent Advances in Line Graphs and Line Digraphs* at International Workshop on Algorithms, Complexity and Some Recent Advances in Graph Theory - 2023 Atmiya University, Rajkot, Gujarat, India, in association with Hemchadracharya North Gujarat University, Patan, Gujarat, India.
2. *Models of Computing, AI, and Machine Learning: Applications to Health Sciences and Orthopedics*, invited faculty presentation at the 41st Annual Conference of Gujarat Orthopedic Association (GOACONN), Bharuch, Gujarat, India, from 3-5 February 2023.
3. *Recent Advances in Line Graphs and Line Digraphs*. invited presentation as the Prof. S. Arumugam Endowment Lecturer, Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, 27 January 2023.
4. Eight lectures on *Topics in Cryptography and Cybersecurity* to about one-hundred juniors and seniors in the Computer Engineering program at Ramco Institute of Technology, Rajapalayam, Tamilnadu, India, 23-26 January 2023.
5. Two presentations in *Workshop on Line Graphs & Labelings of Graphs* at Birla Institute of Science and Technology (BITS) Campus, Goa, India, 18-19 January, 2023.
6. *New Research Directions in Line Graphs*, invited presentation (with Lowell Beineke) at the International Conference on Graphs, Networks and Combinatorics (ICGNC 2023), New Delhi, India, 10-12 January 2023.
7. *The Voting System Technical Oversight Program's (VSTOP) Role in Technology and Cybersecurity for the State of Indiana: A Perspective of Indiana Legislation and Election Administration*, presented jointly with the VSTOP Team, Colloquium at Ball State University, Department of Computer Science, October 2022.
8. *Computational Complexity of Some Graph Algorithms and Graph Recognition Problems*. Seminar at Indiana University Purdue University Indianapolis (IUPUI), Department of Computer Science, April 2022.
9. *Computational Complexity of Some Graph Algorithms and Graph Recognition Problems*. Colloquium at Ball State University, Department of Computer Science, April 2022.
10. *New Results and Open Problems in Line Graphs..* Invited presentation (with Lowell Beineke) at the International Conference on Graphs, Combinatorics and Optimization, BITS Pilani, Dubai Campus, February 2022.
11. *Some Open Problems in Line Graphs and Line Digraphs*. Invited Speaker and Inaugural Speaker at the International Conference on Theoretical Computer Science and Discrete Mathematics, Sri Sivasubramaniya Nadar College of Engineering, India, December 2021.
12. *Graph Labeling Algorithms and Applications to Computer Science* Tech Talk, Colloquium Presentation at Georgia Gwinnett College, October 2021.

13. *Properties of Graceful Labelings of Graphs and Digraphs*. Invited Keynote Speech at IWOGL 2021 (International Workshop On Graph Labeling), September 2021.
14. *Risk Limiting Audits in Indiana: Lessons Learned and Best Practices Developed*. State Certification Testing of Voting Systems, June 2021.
15. *Recent Legislative Developments for Election Equipment Certification: The Case of Indiana*. State Certification Testing of Voting Systems, June 2021.
16. *Computational Complexity and Applications of Graph Algorithms*. Invited presentation at the Second International Conference on Applied Mathematics and Intellectual Property Rights, A.P.C. Mahalaxmi College For Women, March 2021.
17. *Graceful Labelings of Unicyclic Graphs*. 52nd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Florida Atlantic University, March 2021.
18. Keynote Speaker at INNOVATIONS IN INTERDISCIPLINARY RESEARCH VIRTUAL INTERNATIONAL CONFERENCE, Kalasalingam Academy of Research and Education, India, 2020
19. Chief Guest and Inaugural Speaker at INNOVATIONS IN INTERDISCIPLINARY RESEARCH VIRTUAL INTERNATIONAL CONFERENCE, Kalasalingam Academy of Research and Education, India, 2020.
20. Professor S. Arumugam Endowment Lecturer, Manonmaniam Sundranar University, India, 2020.
21. Invited Presentation at International Conference on Theoretical Computer Science and Discrete Mathematics at Kalasalingam University, India, December 2016.
22. (2018) Graceful Labelings of Unicyclic Graphs, International Conference on Discrete Mathematics and its Applications to Network Science, BITS Pilani, Goa Campus, India.
23. (2016) Are trees Graceful? Indiana University Purdue University Fort Wayne, March 23, 2016.
24. (2016) PI MU EPSILON Presentation: "The Mathematics and Technology of Elections and Voting. IPFW, 2016.
25. (2016) Programming Problems in Graph Theory, Elections and Voting, Colloquium Presentation at Ball State, Nov 16, 2016.
26. (2016) An Optimization Problem on Super Line Graphs. 57th Midwest Graph Theory (MIGHTY) Conference held at Wright State University, Dayton, Ohio, April 9, 2016.
27. (2016) Super Line Graphs and the Line Completion Number, Research Presentation at International Conference on Theoretical Computer Science and Discrete Mathematics at Kalasalingam University, India, December 2016.
28. (2015) The Technology of Elections and Voting Systems" to students and faculty at Kalasalingam University (via live video) in February 2015.
29. (2013) Graceful Labeling Algorithms, invited lecture at Kalasalingam University, January 2013

30. (2013) Three Lectures in Bioinformatics, Invited lectures at Kalasalingam University, January 2013.
Lecture 1: Introduction to Bioinformatics and Complexity of Algorithms
Lecture 2: Informatics Algorithms
Lecture 3: Biological Networks and Graph Theory
31. (2013) (Invited Plenary Presentation) Graphical Models in Bioinformatics, International Conference in Applied Mathematics Theoretical Computer Science (ICAMTCS 2013), St. Xavier's Catholic College of Engineering, Tamilnadu, India, January 24-25, 2013.
32. (2013) (Invited Plenary Presentation) Electronic Voting Systems and Risk Limiting Audits, International Statistical Conference, Bangladesh Statistical Association, Dhaka, 27-29 December 2012.
33. (2012)(Invited Plenary Presentation) Graphical Models of Biological Networks, International Conference on Statistical Data Mining for Bioinformatics, Health, Agriculture and Environment, 21-24 December 2012, Rajshahi University, Bangladesh.
34. (2012) Algorithms in Bioinformatics, International Conference on Statistical Data Mining for Bioinformatics, Health, Agriculture and Environment, 21-24 December 2012, Rajshahi University, Bangladesh. (2011) Graceful Labellings of Graphs, University of Engineering and Technology, Vietnam National University, December 2011.
35. (2010) Super Line Graphs, International Conference on Recent Trends in Graph Theory and Combinatorics (ICRTGC - 2010), Cochin, India, August 12-15, 2010.
36. (2009) Workshop in Graph Theory, Algorithms, and Applications, University of Yaoundé I, Cameroon, September 7-11, 2009.
37. (2009) (Invited Presentation) Frank Harary's Graph Theory in Games, Tournaments and Social Networks (Annual Frank Harary Lecture Series), Department of Computer Science, New Mexico State University, April 8, 2009.
38. (2009) A Course in Graph Theory and its Applications, A three lecture course given to researchers and fellows at United Nations University - International Institute for Software Technology (UNU-IIST), Macau, China, March 17-23, 2009.
39. (2009) (Invited Presentation) Graceful Labelings of Some Classes of Unicyclic Graphs - Properties and Algorithms, Texas A&M University, Galveston, February 4, 2009.
40. (2008) Graceful Labelings of Unicyclic Graphs, International Conference on Discrete Mathematics (ICDM 2008), Mysore, India, June 6-10, 2008.
41. (2008) Graceful Labelings - Properties and Algorithms, Indian Institute of Technology (IIT), Kharagpur, India, May 2008.
42. (2007) Properties and of Graceful Labelings of Cycles, International Conference on Recent Developments in Combinatorics and Graph Theory, Kalasalingam University, India, June 2007.
43. (2007) Properties of Graceful Labelings of Cycles, The Thirty-Eighth Southeastern International Conference on Combinatorics, Graph Theory, and Computing, March 2007 in the University Center at Florida Atlantic University in Boca Raton, FL.
44. (2007) Knowledge Management Software Systems in Academia and Industry, Invited presentation at the 94th Indian Science Congress, Annamalai University, India, January 2007.

45. (2006)Software Systems for Implementing Graph Algorithms for Learning and Research, The First International Conference on Theories and Applications of Computer Science (ICTACS'06), Vietnam, August 2006.
46. (2005)Model Checking with SPIN and its Industrial Applications (Tutorial), ICTAC05 - International Colloquium on Theoretical Aspects of Computing, Hanoi, Vietnam, October 2005.

JOURNAL EDITOR/
REFEREE

- Editorial Board Member, South East Asian Journal of Mathematics and Mathematical Sciences, published by Ramanujan Society of Mathematics and Mathematical Sciences.
- Associate Editor, VNU Journal of Science: Computer Science and Communication Engineering.
- Co-Editor, Journal of Combinatorial Math and Combinatorial Computing, Volume 84, 2012.
- Program Committee Member and Reviewer, Fourth International Conference on Knowledge and Systems Engineering (KSE 2012).
- Co-Editor, Journal of Combinatorial Math and Combinatorial Computing, Volume 69, 2009.
- Served on Review Panels for several National Science Foundation (NSF) SBIR-STTR proposals.
- Served on Fulbright Review Committee.
- Co-Editor, Congressus Numerantium, Volumes 63 and 64, 1988.
- Reviewer/Referee for
 - Australasian Journal of Combinatorics
 - South East Asian Journal of Mathematics and Mathematical Sciences
 - The Journal of Combinatorial Mathematics and Combinatorial Computing
 - Congressus Numerantium
 - Discrete Math
 - Ars Combinatoria
 - Math Reviews
 - Several books
 - Several Conference Proceedings
 - External reviewer for awards/promotions to full professor, External reviewer for grant proposals
 - Asian Applied Computing Conference.

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