

**Mike O’Leary**  
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## Education

Ph.D. Mathematics, Northwestern University, 1995

M.S. Mathematics, Northwestern University, 1991

B.S. Physics and Mathematics, Benedictine University, (formerly Illinois Benedictine College), 1989

## Academic Appointments

2015–Present	Chairperson, Department of Mathematics, Towson University
2009–Present	Professor, Department of Mathematics, Towson University
2005–Present	Joint Appointment with the Department of Computer and Information Sciences, Towson University
2011–2015	Director, School of Emerging Technologies, Towson University
2008–2012	Director, Integrated Homeland Security Management Master’s Program, Towson University
2007–2011	Director, Center for Applied Information Technology, Towson University
2003–2009	Associate Professor, Department of Mathematics, Towson University
1998–2003	Assistant Professor, Department of Mathematics, Towson University
1997–1998	Visiting Assistant Professor, Department of Mathematics, University of California, Santa Cruz
1995–1997	Visiting Assistant Professor, Department of Mathematics, University of Oklahoma

## Major Accomplishments

- As Chair of the Department of Mathematics, successfully conducted the seven-year external evaluation and re-certification as a Center of Actuarial Excellence. Led faculty in the creation of a new M.S. in Actuarial Science and Predictive Analytics. Oversaw the hiring of eleven tenure/tenure-track faculty, one clinical faculty, and seven lecturers.
- As the founding Director of the School of Emerging Technologies, created the SET Seed Funding program, which supported 35 faculty from 17 departments on fourteen different interdisciplinary research projects in emerging technologies. Developed the steering committee to oversee the School. Worked to develop the M.S. in Marketing Intelligence, which launched in 2015.
- Developed a new mathematical algorithm for the geographic profiling problem, which is the problem of estimating the location of the home base of a serial criminal based on the location of the crimes. Implemented the algorithm in open source software and provided the tool to police agencies across the country for use.
- Directed the Center for Applied Information Technology, a self-support unit inside the Division of Economic and Community Outreach that provides the M.S. in Applied Information Technology. Responsible for budgeting, finances, staffing, and physical space. Doubled enrollment to 327 students from 2007 to 2011. Brought the program to the HEAT Center in 2009, developed new courses to support the needs of Aberdeen Proving Grounds, and began offering the program online.
- Created and developed the course Case Studies in Computer Security, the capstone course for undergraduate computer security students. Created and led the Towson University student Cyber Defense team, which has won numerous major regional competitions, including the 2010, 2012, and 2014 CCDC Mid-Atlantic Regional competition, the 2011 Maryland Cyber Challenge and the 2010 CSC Cyb3r Battl3ground competition.

## Grants

I have served as the principal investigator or co-principal investigator on seventeen externally funded projects valued at more than \$5.39M.

17. M. O'Leary (PI), A. Kolesnikov, L.-K. Lauderdale, *Recruiting, Educating, and Graduating a Diverse Community of Mathematicians Through Mentoring, Peer Support, and Undergraduate Research*, National Science Foundation, S-STEM Scholarships in Science, Technology, Engineering, and Mathematics, 2/1/2021 - 1/31/2026, NSF-DUE 2031345, \$999,152.
16. J. Dehlinger (PI), S. Azadegan (former PI), M. O'Leary, B. Taylor, S. Kaza, N. Nguyen (co-PI), *CyberCorps: Scholarship for Service at Towson University*, National Science Foundation, Cybercorps, Scholarship for Service, 7/2017 - 6/2022, NSF-DGE 1663184, \$2,543,752.
15. J. Dehlinger (PI), S. Azadegan, N. Nguyen, S. Acharya, C. Brown, G. Meiselwitz, A. Wijesinha, A. Mangle, & M. O'Leary (co-PI), *Building a Technical and General Education Cybersecurity Modules Curriculum*, National Security Agency, NSA BAA 2017 CyberSecurity Core Curricula Development Proposal, RFI-2017-00022, \$190,662.
14. S. Kaza (PI), S. Azadegan, M. O'Leary, B. Taylor, S. Chakraborty, Y. Kim, & Z. Tang (co-PI), *Pathways to Cybersecurity Degrees at Towson: Building Capacity for US Army Reservists*, Department of Defense, 9/2016 - 8/2017, \$185,800.
13. M. O'Leary (PI), C. Turner (co-PI), *DoD Information Assurance Scholarship Program: Capacity Building; Helping Bowie State Develop a Case Studies Course in Computer Security*, Department of Defense, H98230-11-100437, 8/2011 - 11/2012, \$20,192.
12. M. O'Leary (PI), S. Hilberg & S. Chakraborty (co-PI), *Expanding the Reach of IT Programs*, Maryland Higher Education Commission BRAC Higher Education Fund, 1/2011 - 12/2011, \$73,844.
11. M. O'Leary (PI), S. Kaza, W. Yu, & L. Ray (co-PI), *DoD Information Assurance Scholarship Program; Scholarship & Capacity Building*, Department of Defense, 9/2010 - 12/2011, \$61,493.
10. M. O'Leary (PI), *The Mathematics of Geographic Profiling*, National Institute of Justice 2009-SQ-B9-K014, 8/2009 - 7/2012, \$95,465.
9. M. O'Leary (PI), S. Kaza & S. Acharya (co-PI), *Expanding an Applied Information Technology Masters Program*, Maryland Higher Education Commission BRAC Higher Education Fund, 1/2009 - 12/2009, \$90,990.
8. H. Hochheiser (PI), B. Taylor, S. Azadegan, C. Turner & M. O'Leary (co-PI), *Building Security In: Injecting Security throughout the Undergraduate Computing Curriculum*, National Science Foundation, Course Curriculum and Laboratory Improvement: Phase 2 (Expansion Projects), DUE 0817267, 9/2008-8/2011, \$399,506.
7. J. Feng (PI), J. Lazar, M. O'Leary, A. Zenebe & C. Turner (co-PI), *Integrating Usability and Accessibility in Information Assurance Education*, National Science Foundation, Federal Cyber Service: Scholarship for Service, DUE 0830865, 10/2008-9/2010, \$299,982.
6. M. O'Leary (PI), *The Mathematics of Geographic Profiling*, National Institute of Justice 2007-DE-BX-K005, 9/2007 - 8/2008, \$45,443.
5. M. O'Leary (PI) & C. Turner (co-PI), *A Second Generation Faculty Development Program*, National Science Foundation, Federal Cyber Service: Scholarship for Service, DUE 0723368, 9/2007 - 8/2010, \$299,963.
4. M. O'Leary (PI), A. Engel & C.L. May (co-PI), *Finding the Optimal Search Area for a Serial Criminal*, National Institute of Justice 2005-IJ-CX-K036, 7/2005 - 8/2007, \$49,961.
3. S. Azadegan (PI), M. O'Leary, D. Frincke, A. Wijesinha, & M. Zimand (co-PI), *An Undergraduate Computer Security Track*, National Science Foundation, Federal Cyber Service: Scholarship for Service, DUE 0113783, 9/2001-8/2003, \$160,068.
2. M. O'Leary (PI) & S. Azadegan (co-PI), *A Mathematics Course in Scientific Simulation*, National Science Foundation, Course, Curriculum and Laboratory Improvement, DUE 9952625, 4/2000 - 10/2003, \$68,982.
1. M. Siegel (PI), M. O'Leary & S. Azadegan (co-PI), *Validation and Enhancements of Application of Models from Epidemiology to INFOSEC Assurance Metrics*, Science Applications International Corporation, 10/29/1998 - 9/30/1999, \$25,686.

## Books

2. M. O'Leary, *Cyber Operations: Building, Defending, and Attacking Modern Computer Networks*, Second Edition, Apress, March 2019, 1134 pages.
1. M. O'Leary, *Cyber Operations: Building, Defending, and Attacking Modern Computer Networks*, Apress, October 2015, 772 pages.

## Research

One area of my research is on the geographic profiling problem, which is to create a search area for the location of the home base of a serial criminal from knowledge of the offender's crime locations. I am also involved in the development of improved teaching techniques for cyber security education.

Past work has been on the mathematical analysis of singular and degenerate parabolic partial differential equations, as well as the Navier-Stokes system for fluid mechanics.

## Publications

37. M. O'Leary, *Innovative Pedagogical Approaches to a Capstone Laboratory Course in Cyber Operations*, SIGCSE, Seattle, WA, March 8-11, 2017.
36. S. Azadegan & M. O'Leary, *An Undergraduate Cyber Operations Curriculum in the Making: A 10+ Year Report*, IEEE ISI 2016, Tucson, Arizona September 28-30, 2016.
35. M. O'Leary, *Small-Scale Cyber Defense Competitions*, Proceedings of the 16th Colloquium for Information Systems Security Education, Orlando, FL, June 11-13, 2012.
34. M. O'Leary, *Modeling Criminal Distance Decay*, *Cityscape*, **13**, No. 3 (2011), pp. 161–198.
33. M. O'Leary, *Multimodel Inference and Geographic Profiling*, *Crime Mapping: A Journal of Research and Practice* **2**, No. 1, (2010).
32. M. O'Leary, *Implementing a Bayesian Approach to Criminal Geographic Profiling*, First International Conference on Computing for Geospatial Research and Application (COM.Geo 2010), June 21-23, 2010, Washington, DC.
31. C. Turner, J. Odibuyi and M. O'Leary, *A Cross-Institutional Faculty Research Mentorship Program in Information Security and Assurance*, Proceedings of the 14<sup>th</sup> Colloquium for Information Systems Security Education, Baltimore, MD, June 7-9, 2010.
30. S. Kaza, B. Taylor, H. Hochheiser, S. Azadegan, M. O'Leary, and C. Turner, *Injecting Security in the Curriculum - Experiences in Effective Dissemination and Assessment Design*, Proceedings of the 14<sup>th</sup> Colloquium for Information Systems Security Education Baltimore, MD, June 7-9, 2010.
29. M. O'Leary, *The Mathematics of Geographic Profiling*, *Journal of Investigative Psychology and Offender Profiling* **6**, No. 3 (2009), pp. 253-265.
28. C. Turner, H. Hochheiser, J. Feng, B. Taylor, J. Lazar, A. Zenebe, S. Azadegan & M. O'Leary, *Cooperative Information Assurance Capacity Building*, Proceedings of the 13<sup>th</sup> Colloquium for Information Systems Security Education, Seattle, WA, June 1 - 3, 2009.
27. B. Taylor, H. Hochheiser, S. Azadegan & M. O'Leary, *Cross-site Security Integration: Preliminary Experiences across Curricula and Institutions*, Proceedings of the 13<sup>th</sup> Colloquium for Information Systems Security Education, Seattle, WA, June 1 - 3, 2009.
26. J. Miller & M. O'Leary, *A Diffusion Model in Population Genetics with Dynamic Fitness*, *J. Differential Equations* **225**, No.2, (2006), pp. 465–512.
25. M. O'Leary, S. Azadegan & J. Lakhani, *Development of a HoneyNet Laboratory: A Case Study*, Proceedings of the 7<sup>th</sup> ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing (Las Vegas, NV, June 19-20, 2006), pp. 401-406.
24. S. Azadegan, M. O'Leary, A. Wijesinha, & M. Zimand, *Undergraduate Computer Security Education: A Report on our Experience & Learning*, in *Practical and Experimental Approaches to Information Security Education*, Proceedings of WECS 7, Cynthia Irvine, Matthew Rose and Naomi Falby (eds.), pp. 17-27.
23. J. Wolfson & M. O'Leary, *Undergraduate Research and Civic Engagement: Tale of Two Programs*, *CUR Quarterly*, **26** No. 2, December 2005, pp 70-73.

22. M. O'Leary, *Go with the Flow*, in *Demos with Positive Impact*, D.R. Hill & L.F. Roberts, eds., Internet, August 2005, <http://www.mathdemos.org/mathdemos>.
21. M. O'Leary & S. Azadegan, *An Interdisciplinary Approach to Scientific Modeling and Simulation*, in Proceedings of the Sixth International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing and First ACIS International Workshop on Self-Assembling Wireless Networks (Snpd/Sawn'05) - Volume 00 (May 23 - 25, 2005), IEEE Computer Society, Washington, DC, 372-377.
20. A. Engel, C.L. May & M. O'Leary, *The Baltimore City Fire Department Staffing Problem*, in *Mathematics in Service to the Community. Concepts and Models for Service Learning in the Mathematical Sciences*, C. Hadlock ed., The Mathematical Association of America, 2005, pp. 35-46.
19. T. Giorgi & M. O'Leary, *On the Local Integrability and Boundedness of Solutions to Quasilinear Parabolic Systems*, Electron. J. Qual. Theory Differ. Equ. **2004**(2004), No. 14, pp. 1-14.
18. M. O'Leary, *Developing Computer Simulations Using Object-Oriented Programming. The Three-Body Problem: A Case Study*, in Proceedings of the Fifteenth Annual International Conference on Technology in Collegiate Mathematics (ICTCM 15), Pearson, 2004, pp. 222-226.
17. M. O'Leary, *Conditions for the Local Boundedness of Solutions to the Navier-Stokes System in Three Dimensions*, Comm. Partial Differential Equations **28** (2003), pp. 617-636.
16. S. Azadegan, M. Lavine, M. O'Leary, A. Wijesinha, & M. Zimand, *An Undergraduate Track in Computer Security*, in *Security Education and Critical Infrastructures*, C.E. Irvine & H. Armstrong (Eds.), IFIP Conference Proceedings **253**, Kluwer, 2003, pp. 319-332.
15. S. Azadegan, M. Lavine, M. O'Leary, A. Wijesinha, & M. Zimand, *An Undergraduate Track in Computer Security*, in Proceedings of the 8<sup>th</sup> Annual Conference on Innovation and Technology in Computer Science Education (ITICSE-03), Thessaloniki, Greece, June 30 - July 2 2003, pp. 207-210.
14. J.L. Aron, M. O'Leary, R.A. Gove, S. Azadegan, & M.C. Schneider, *The Benefits of a Notification Process in Addressing the Worsening Computer Virus Problem: Results of a Survey and a Simulation Model*, Computers & Security **21** (2002), pp. 142-163.
13. M. O'Leary, *The Resonant Filter*, in *Demos with Positive Impact*, D.R. Hill & L.F. Roberts eds., Internet, July 2002, <http://www.mathdemos.org/mathdemos>.
12. R. Boules & M. O'Leary, *Mathematica Based Computer Laboratories for the Enhancement of a Calculus Sequence*, in Proceedings of the Thirteenth Annual International Conference on Technology in Collegiate Mathematics (ICTCM 13), Addison Wesley, 2002, pp. 35-39.
11. J. Miller, M. O'Leary, & M. Schonbek, *Nonexistence of Singular Pseudo-Self-Similar Solutions of the Navier-Stokes System*, Math. Ann. **319**, (2001), 809-815.
10. M. O'Leary, *Integrability and Boundedness for Local Solutions to Doubly Degenerate Quasilinear Parabolic Equations*, Adv. Differential Equations, **5**(10-12), October-December 2000, pp. 1465-1492.
9. M. O'Leary, *Local Estimates for Solutions to Singular and Degenerate Quasilinear Parabolic Equations*, in *Nonlinear Partial Differential Equations*, G.-Q. Chen and E. DiBenedetto, eds., Contemporary Mathematics, **238**, American Mathematical Society, Providence, RI, 1999, pp. 241-249.
8. M. O'Leary, *Integrability and Boundedness for Local Solutions of Singular and Degenerate Quasilinear Parabolic Equations*, Differential Integral Equations, **12** (1999), no. 3, pp. 435-452.
7. M. O'Leary, *Pressure Conditions for the Local Regularity of Solutions of the Navier-Stokes Equations*, Electron. J. Differential Equations, **1998**(1998), No. 12, pp. 1-9.
6. M. O'Leary, *Taylor Polynomials for Rational Functions*, The College Mathematics Journal, **29**(3), June 1998, pp. 226-228.
5. M. O'Leary, *Mushy Regions in Conduction-Convection Problems with Change of Phase*, Proceedings of the Thirteenth Annual Conference on Applied Mathematics, University of Central Oklahoma, 1997. (Refereed Proceedings)
4. M. O'Leary, *Analysis of the Mushy Region in Conduction-Convection Problems with Change of Phase*, Electron. J. Differential Equations, **1997**(1997), No. 04, pp. 1-14.
3. E. DiBenedetto & M. O'Leary, *Conduction-Convection Problems with Change of Phase*, SIAM Special Volume for the 70th Birthday of I. Stackgold, (1995), pp. 104-114.
2. E. DiBenedetto & M. O'Leary, *Local  $C^\alpha$  Convergence of Elliptic Regularizations of Parabolic Equations*, Meccanica, **28**, (1993), pp. 97-102.

1. E. DiBenedetto & M. O'Leary, *Three Dimensional Conduction-Convection Problems with Change of Phase*, Arch. Rat. Mech. Anal., **123**, (1993), pp. 99-116.

## Laboratory Manuals

3. M. O'Leary & S. Azadegan, *A Course in Scientific Simulation*, Academx Press, 2003.
2. R. Boules, G. Goodson, O. Kim & M. O'Leary, *Laboratory Explorations for Single-variable Calculus using Mathematica*, Harcourt Custom Publishers, 2001.
1. R. Boules, G. Goodson, O. Kim & M. O'Leary, *Laboratory Explorations for Multivariable Calculus using Mathematica*, Harcourt Custom Publishers, 2001.

## Talks and Presentations

75. *Hot Topic: Cybersecurity: Protecting Systems Users and Data*, Panel Session with Jan Ettles and Julie Fontenelle, Special Libraries Association (SLA) 2019 Annual Conference, Cleveland, OH, June 14-18, 2019.
74. *Innovative Pedagogical Approaches to a Capstone Laboratory Course in Cyber Operations*, SIGCSE, Seattle, WA, March 8-11, 2017.
73. *Defending your Network: A Survey of Common Cyber Threats*, TUGIS, March 2016.
72. *Defend Your Cyber World*, Northeast Maryland Technology Council (NMTC) Expert Speaker Series, October 2015.
71. *Applying Mathematics... to Catch Criminals*, American Statistical Association, Aberdeen Proving Grounds, February 2015.
70. *Applying Mathematics to Catch Criminals*, Senior Science Society, Bel Air, MD, November 2014.
69. *Computer Science Education*, STEM Summit X, Aberdeen Proving Grounds, May 2014.
68. *How Bad Things Happen to Good Computers: A Live Demonstration of Cyber Attacks, and the Tools and Techniques We Can Use to Reduce Our Risks*, NMTC Science Cafe, Bel Air Library, January 2014.
67. *Engaging Students* (panel), 2013 National Initiative for Cybersecurity Education (NICE) Workshop, Gaithersburg, MD, September 18, 2013.
66. *When Bad Things Happen to Computer Networks*, National Defense Industrial Association (NDIA) Scholarship Awards Dinner, April 26, 2013.
65. *When Bad Things Happen to Computer Networks: A demonstration of how hackers break into systems and what we can all do to reduce our risks*, Susquehanna Workforce Network, October 8, 2012.
64. *When Bad Things Happen to Computer Networks: A demonstration of how hackers break into systems and what we can all do to reduce our risks*, Bowie State University, September 27, 2012.
63. *When Bad Things Happen to Good Computers: Learn the techniques hackers use to break into your system*, Northeast Maryland Technology Council (NMTC) Expert Speaker Series, September 13, 2012.
62. *When Bad Things Happen to Computer Networks: A demonstration of how hackers break into systems and what we can all do to reduce our risks*, Edward V. Badolato Distinguished Speaker Series in Homeland Security, September 7, 2012.
61. *Small Scale Cyber Security Competitions*, Colloquium for Information Systems Security Education, Orlando, FL, June 2012.
60. *Models for Offender Target Location Selection with Explicit Dependency Structures*, Quantitative Methods in Defense and National Security 2012, Fairfax, VA, April 30 - May 1, 2012.
59. *Patterns in Offender Distance Decay and the Geographic Profiling Problem*, Eleventh Crime Mapping Conference, Miami, FL, October 2011.
58. *A New Software Prototype for Geographic Profiling*, Eleventh Crime Mapping Conference, Miami, FL, October 2011.
57. *Applying Mathematics... to Catch Criminals*, Randolph Macon College, Ashland, VA, September 2011.
56. *Patterns in Offender Distance Decay and the Geographic Profiling Problem*, AMS-MAA Joint Meetings, New Orleans, LA, January 2011.
55. *Patterns in Offender Distance Decay and the Geographic Profiling Problem*, 1063<sup>rd</sup> Meeting of the American Mathematical Society, Los Angeles, CA, October 2010.
54. *Implementing a Bayesian Approach for the Geographic Profiling Problem*, The First International Conference on Computing for Geospatial Research and Applications (COM.Geo 2010), Washington, DC, June 2010.

53. *New Approaches for the Geographic Profiling Problem*, The NIJ Conference, Arlington, VA, June 2010.
52. *Modeling Distance Decay for the Geographic Profiling Problem*, Geospatial Technical Working Group, Portland, OR, April 2010.
51. *Searching for the Home Base of a Serial Criminal*, AMS-MAA Joint Meetings, San Francisco, CA, January 2010.
50. *Mathematical Models for the Geographic Profiling Problem*, UCLA Applied Mathematics Colloquium, Los Angeles, CA, November 2009.
49. *A New Software Tool for Geographic Profiling*, The Tenth Crime Mapping Conference, New Orleans, LA, August 2009.
48. *A New Software Tool for Geographic Profiling*, The NIJ Conference, Arlington, VA, June 2009
47. *Cross-site Security Integration: Preliminary Experiences across Curricula and Institutions*, 13<sup>th</sup> Colloquium for Information Systems Security Education, Seattle, WA, June 2009.
46. *Mathematical models for the geographic profiling problem*, Center for Evidence-Based Crime Policy, George Mason University, Fairfax, VA, March 2009.
45. *Mathematical models for the geographic profiling problem*, Georgetown University Mathematics Department Colloquium, Washington, DC, March 2009.
44. *Determining the Optimal Search Area for a Serial Criminal*, Joint Mathematics Meetings, Washington DC, January 2009.
43. *A Diffusion Model in Population Genetics with Mutation and Dynamic Fitness*, PDE Seminar, Vanderbilt University, Nashville, TN, November 2008.
42. *Advances in Geographic Profiling*, 31<sup>st</sup> Applied Geography Conference, Wilmington DE, October 2008.
41. *Determining the Optimal Search Area for a Serial Criminal*, INFORMS National Meeting, Washington, DC, October 2008.
40. *Using Mathematics... To Catch Criminals*, Kappa Mu Epsilon Initiation, Stevenson University, Baltimore, MD, September 2008.
39. *The Mathematics of Geographic Profiling*, The NIJ Conference, Arlington, VA, July 2008.
38. *A Diffusion Model in Population Genetics with Mutation and Dynamic Fitness*, The World Conference on Nonlinear Analysis, Orlando, FL, July 2008.
37. *A Diffusion Model in Population Genetics with Mutation and Dynamic Fitness*, The Sixth International Conference on Differential Equations and Dynamical Systems, Baltimore, MD, May 2008.
36. *The Mathematics of Geographic Profiling*, Spring Meeting, Geospatial Technology Working Group, New Orleans, LA, April 2008.
35. *The Mathematics of Geographic Profiling*, Center for Army Analysis, Fort Belvoir, VA, April 2008.
34. *Starting and Maintaining a Student Industrial Research Program in the Mathematical Sciences*, (Panel Discussion with Tim Hsu, Bob Borrelli and Michael Raugh), MathFest, San Jose, CA, August 2007.
33. *The Mathematics of Geographic Profiling*, Baltimore County Police Department, Towson, MD, June 2007.
32. *The Mathematics of Geographic Profiling*, Ninth Crime Mapping Research Conference, Pittsburgh, PA, March 2007.
31. *The Mathematics of Geographic Profiling*, Crime Hot Spots: Behavioral, Computational and Mathematical Models, Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, CA, January 29 - February 2, 2007.
30. *Web Security*, 8<sup>th</sup> Session of the Information Security Discussion Series, Social Security Administration, Baltimore, MD, August 2006.
29. *A New Mathematical Technique for Geographic Profiling*, The NIJ Conference, Washington, DC, July 2006.
28. *Undergraduate Research and Civic Engagement: A Tale of Two Programs*, CUR 2006 National Conference, DePauw University, Greencastle, IN, June 2006 [with J. Wolfson].
27. *Determining the Optimal Search Area for a Serial Criminal*, Modeling and Simulation Technical Working Group, National Institute of Justice, Jersey City, NJ, March 2006.
26. *A Laboratory Based Capstone Course in Computer Security for Undergraduates*, Thirty-Seventh SIGCSE Technical Symposium on Computer Science Education, Houston, TX, March 2006.
25. *Go with the Flow*, Joint Mathematics Meetings, San Antonio, TX, January 2006.
24. *A Mesoscale Diffusion Model in Population Genetics with Dynamic Fitness*, Seminar, Towson University, April 2005.
23. *"Optimum" Strategies for Information Security*, Towson University, Towson, MD, October 2004.
22. *Conditions for the Local Boundedness of Solutions to the Navier-Stokes System in Three Dimensions*, 996<sup>th</sup> Meeting

- of the American Mathematical Society, University of Southern California, Los Angeles, CA, April 2004.
21. *The Towson University Applied Mathematics Laboratory*, Joint Mathematics Meetings, Phoenix, AZ, January 2004.
  20. *A Course in Scientific Simulation*, Joint Mathematics Meetings, Phoenix, January 2004. [Poster Session]
  19. *Developing Demonstrations and Simulations using Microsoft Visual C++*, International Conference on Technology in Collegiate Mathematics, (ICTCM 16), Rosemont, IL, November 2003.
  18. *An Undergraduate Track in Computer Security*, Third Annual World Conference on Information Security (WISE 3), Monterey, CA, June 2003.
  17. *Using Epidemiological Models to Analyze the Spread of Computer Viruses*, Montclair State University, March 2003.
  16. *Developing Computer Simulations Using Object-Oriented Programming. The Three-Body Problem: A Case Study*, International Conference on Technology in Collegiate Mathematics (ICTCM 15), Orlando, FL, November 2002.
  15. *Conditions for the Local Regularity of Solutions to the Navier-Stokes System*, Towson University, Towson, MD, October 2002.
  14. *A Course in Scientific Modeling and Simulation*, NSF DUE Projects in Mathematics, Arlington, VA, March 2002. [Poster Session]
  13. *Modeling and Simulating the Double Pendulum*, Joint Mathematics Meetings, San Diego, CA, January 2002.
  12. *Mathematica Based Computer Laboratories for the Enhancement of a Calculus Sequence*, Thirteenth Annual International Conference on Technology in Collegiate Mathematics (ICTCM 13), Atlanta, GA, November 2000 [with R. Boules].
  11. *Pressure Conditions for the Local Regularity of the Navier-Stokes Equations*, Georgetown University, Washington, DC, September 1999.
  10. *Pseudo-Self-Similar Solutions of the Navier-Stokes System*, Towson University, Towson, MD, September 1999.
  9. *An Analysis of the Mushy Region in Conduction-Convection Problems with Change of Phase*, Towson University, Towson, MD, October 1998.
  8. *Integrability and Boundedness of Local Solutions to Singular and Degenerate Quasilinear Parabolic Equations*, International Conference on Nonlinear PDE and Applications, Evanston, IL, March 1998.
  7. *Using Projects in a Large Lecture Traditional Calculus Course: Notes from the Field*, MAA Sectional Meeting, University of Central Oklahoma, Edmond, OK, April 1997.
  6. *Pressure Conditions for the Local Regularity of the Navier-Stokes Equations*, University of Oklahoma, Norman, OK, March 1997.
  5. *An Analysis of the Mushy Region in Conduction-Convection Problems with Change of Phase*, Thirteenth Annual Conference on Applied Mathematics, University of Central Oklahoma, Edmond, OK, February 1997.
  4. *An Analysis of the Mushy Region in Conduction-Convection Problems with Change of Phase*, University of Oklahoma, Norman, OK, September 1996.
  3. *Conduction-Convection Problems with Change of Phase*, University of Oklahoma, Norman, OK, September 1995.
  2. *Conduction-Convection Problems with Change of Phase*, SIAM-CBMS Conference on Inverse Problems and Non-Destructive Evaluation, June 1995.
  1. *Conduction-Convection Problems with Change of Phase*, Free Boundary Problems, Theory and Applications, Toledo, Spain, June 1993. [Poster Session]

## Teaching

In mathematics, I have experience teaching a range of undergraduate and graduate courses, including Calculus, Discrete Mathematics, Differential Equations, Euclidean and Non-Euclidean Geometry, Mathematical Models, Cryptography, Numerical Analysis, Integral Transforms, Partial Differential Equations, and Asymptotic and Perturbation Methods.

I co-developed an interdisciplinary course in Scientific Modeling and Simulation, an undergraduate course that combines mathematical modeling and numerical analysis with event-driven graphical computer programming to develop computer simulations of various physical problems.

In computer science, I created and developed the course Case Studies in Computer Security, which is the hands-on capstone course in the undergraduate computer security track. In this flipped class students create, set-up, defend and attack real computer networks in an isolated laboratory setting. The course notes from this class are now available as the book *Cyber Operations*, already noted.

I founded and have led the Towson University Cyber Defense team since our first competition in 2006. We have won the Mid-Atlantic Collegiate Cyber Defense Competition and advanced to the national finals in 2010, 2012 and 2014. In 2015, 2016, and 2017 the team finished third in the Mid-Atlantic Collegiate Cyber Defense Competition. The team also won the 2011 Maryland Cyber Challenge and the 2010 CSC Cyb3r Battl3ground competition.

## Undergraduate Student Research Talks

I have advised students on undergraduate research projects that resulted in public talks at professional meetings.

- Rohan Vazarkar and David Bitner, *Antipwny: An IDS for Metasploit*, BSidesDE, Wilmington DE, November 2013.
- Rohan Vazarkar, *Minecraft Through a Metasploit Module*, BSidesDC, Washington DC, October 2013.
- Johnathan Fragale, *Introduction to the use after free vulnerability and why it matters*, BSidesDE, Wilmington DE, November 2012.
- Greg Kuruc, *Detecting the Break-in: Do you know what your processes are up to?*, BSidesDE, Wilmington DE, November 2012.
- Ogbeide Derrick Oigiagbe and Rayvorn Patterson Jr., *CVE 2012-4681 (Java Applet Remote Code Execution) from the Victims Perspective*, BSidesDE, Wilmington DE, November 2012.

## Graduate Students

- Jacob Oakley, D.Sc. Information Technology, 2018
- Kyle DiGiorgio, M.S. Computer Science, 2017
- Logan Bair, M.S. Computer Science, 2016
- Leslie Newhouse, M.S. Applied & Industrial Mathematics, 2016
- Matt Carr, M.S. Computer Science, 2015
- Dustin Hanks, M.S. Computer Science, 2014
- Matt Mickel, M.S. Computer Science, 2014
- Donte Lowery, M.S. Computer Science, 2013
- Brett Fitti-Hafer, M.S. Applied & Industrial Mathematics, 2013
- Brian Bielski, M.S. Applied & Industrial Mathematics, 2013
- Jeremiah Tucker, M.S. Applied & Industrial Mathematics, 2012
- Brandon Whalen, M.S. Computer Science, 2010
- Jorge Lara Alvarado, M.S. Applied Information Technology, 2009
- Doug Reed, M.S. Computer Science, 2009
- Luke Samuels, M.S. Computer Science, 2009
- Justin Brock, M.S. Applied & Industrial Mathematics, 2008
- Shaun Sensenig, M.S. Computer Science, 2007
- Paul Corbitt, M.S. Applied & Industrial Mathematics, 2006
- Jay Lakhani, M.S. Computer Science, 2006
- Quang Luu, M.S. Computer Science, 2006

I served on the dissertation committee for Joel Hunt, Ph.D. Justice, Law and Criminology, American University, 2016.

## Service

### Department of Mathematics

- In July 2015, I was appointed the Chair of the Department of Mathematics.
- The department has successfully hired 19 faculty, including a tenured full professor as the director of the ASRM program, ten tenure/tenure-track assistant professors, one clinical assistant professor, six permanent lecturers, and one temporary lecturer.
- In 2015, the department completed the renovation of the third floor office space; this includes the creation of the Student Success Center, dedicated space for the UTeach program, a new classroom, and 12 new offices. In 2019, the department completed a renovation of the first and second floor, including four new classrooms.



- In 2016, the department conducted its 7 year external evaluation.
- The department developed a M.S. program in Actuarial Science and Predictive Analytics, which launched in 2019.

### **School of Emerging Technology**

- In October 2011, I was appointed as the founding Director of the School of Emerging Technology; I held this position through Fall 2015.
- The School of Emerging Technologies (SET) serves as an incubator for interdisciplinary faculty/student research and other forms of scholarly and creative collaborations on the study and application of emerging technologies that impact people's lives at work, in the community, and at home. The SET develops and supports innovative, integrative, interdisciplinary programs at the baccalaureate through applied doctoral levels in fields involving emerging technologies, and works to address workforce and public/societal needs. The SET works to forge educational partnerships with community colleges, government agencies, and technology-based industries.
- The School of Emerging Technologies has developed a Seed Funding program that supported 24 faculty from 12 departments on fourteen different interdisciplinary research projects in emerging technologies.
- As the director of the School of Emerging Technologies, I worked to develop and launch the new M.S. in Marketing Intelligence in Fall 2015.

### **Applied Information Technology**

- I was the director of the Center for Applied Information Technology from 2007 through 2011.
- The Center for Applied Information Technology was part of the Division of Economic and Community Outreach. The role of the Center was to run and develop graduate programs in applied information technology that meet the needs of the local community, to create and nurture partnerships with companies and government agencies, and to develop external grants and contracts. The Center was a self-support unit, and I was responsible for budgeting, finances, staffing, and the physical space.
- I developed the CAIT Fellows program, by which the Center supported university faculty working on projects in applied information technology with a focus on economic and community outreach.
- I worked to place students on external graduate assistantships with a number of area government agencies and companies. Students were placed with the Maryland Department of Human Resources, the Maryland Department of Health and Mental Hygiene, and the Board of Child Care. The value of these contracts from 2007-2011 was \$217,072.
- I developed a program to allow Applied Information Technology students to complete their Master's Case Study project for an external organization or a non-profit. Sponsors included Senior Box Office, Hearts & Ears, RESI, CUMMU, and a number of TU departments, including OTS and the Department of Occupational Therapy and Occupational Science.
- I brought the M.S. in Applied Information Technology to the HEAT Center, and worked to create new courses to support the needs of the workers at Aberdeen Proving Grounds, including finding two grants to support these efforts.
- I began offering the M.S. in Applied Information Technology online, including finding two grants to support the online program, one to develop an online cyber security laboratory and one to develop an online environment to support the teaching of elementary programming.

### **Integrated Homeland Security Management**

- I was the director of the Master's program in Integrated Homeland Security Management from 2008-2012.
- The Integrated Homeland Security Management program is a fully online, interdisciplinary program in homeland security, with concentrations in Information Assurance, Health Preparedness, and Security Policy. Program enrollment while I was the director was roughly 40-45 students.

### **Applied Mathematics Laboratory**

- I was the director of the Applied Mathematics Laboratory from 2000-2008.

- The Applied Mathematics Laboratory looks for undergraduate research projects in applied mathematics sponsored by local companies and government agencies, then forms teams of students and faculty members to work on the problem.
- In 2005-2008 we had three projects with the National Institute of Justice to develop an algorithm that would better predict the anchor point of a serial criminal when the crime locations are known.
- In 2004-2005 we had a project with the Carroll Area Transit System to analyze their operations and to predict the number of buses that the system would require in the future. We received a \$1,500 grant to support this project.
- In 2003-2005 we had two projects with the Baltimore County Department of Environmental Protection and Resource Management to study water well failure patterns in rural Baltimore County.
- In 2002-2003 we had a project with the Baltimore City Fire Department to study their scheduling process in an attempt to reduce costs. The student team briefed the Mayor and his staff on the project. A three-minute piece describing the briefing was broadcast on Fox45 Television during the Ten O'Clock news on May 9, 2003. An article was written by Associated Press, and picked up by WBAL Television, and put on their web site.

## National

- I served as an external reviewer for the Department of Mathematics at Cleveland State University (2016).
- I have served as a grant reviewer for the National Science Foundation (2014, 2013, 2002).
- I have served as a grant reviewer for the National Institute of Justice (2015, 2014, 2010, 2009).
- I served on the editorial board for The UMAP Journal (2008-2011).
- I have served as a referee for a number of academic journals and conferences, including
  - Crime Science (2021)
  - Journal of Applied Ecology (2019)
  - Statistica Neerlandica (2019, 2018)
  - Communications in Statistics (2017)
  - The Journal of Investigative Psychology and Offender Profiling (2017, 2015)
  - Crime Science (2015)
  - Methods in Ecology and Evolution (2013)
  - SIAM Undergraduate Research Online (2012)
  - SIAM Journal on Applied Mathematics (2011, 2010, 2009)
  - International Journal of Network Security (2011, 2007)
  - The Colloquium for Information Systems Security Education (2012, 2011)
  - Crime Mapping: A Journal of Theory and Practice (2010)
  - Nonlinear Analysis (2007)
  - Electronic Journal of Differential Equations (2005, 1998)
  - Pacific Journal of Mathematics (2004)
  - Journal of Mathematical Analysis and Applications (2004)
  - Discrete and Continuous Dynamical Systems (2003)
  - IFIP/IEEE International Conference of Dependable Systems and Networks, Dependable Computing and Communications Symposium (2003)
  - Electronic Journal of Qualitative Theory of Differential Equations (2002)
  - SIAM Journal on Mathematical Analysis (1999)
  - Advances in Differential Equations (1998)
- I have worked with the Mathematical Association of America on a number of projects related to undergraduate research in mathematics.
  - I have been a member of the Committee on Student Activities and Chapters from 2007–2011.
  - I served on the Subcommittee on Undergraduate Research from 2000–2007.
  - I worked with the organizers of the Undergraduate Research Poster Session at the Joint National Meetings from 2006–2011.
    - \* I was responsible for making the assignments of judges to posters, ensuring that each poster was judged by faculty who were expert in the research area and had no common affiliations with the students and/or their advisor(s).

- \* I helped to develop the scoring criteria, the score sheets, and the tie breaking algorithms.
  - \* I developed and wrote a computerized scoring network that used a web server and a back end database to allow the organizing team to simultaneously enter the scores into the system using individual laptops.
  - \* In 2011, more than 250 undergraduate research posters were presented.
- I was a reviewer for Math Reviews (2008-2014).

## **University**

- I served on the Office of Academic Innovation (OAI) steering committee, 2013–2019.
- I was a member of the search committee for the Vice President of the Division of Economic and Community Outreach, 2008.
- I was a member of the Faculty Leadership Class for 2001–2002.
- Member, Undergraduate Research Council, 2000–2011.
- Member, University Senate Subcommittee on Information Technology, 2004–2009; Vice-Chair for 2005–2006, 2008–2009; Chair for 2006–2008.

## **College**

- Member, CSM Committee on Undergraduate Research, 2000–2003.

## **Awards**

- Fisher College of Science and Mathematics, Business and Community Outreach Award, 2006.
- 1994-95 Alfred P. Sloan Doctoral Dissertation Fellow.