

# Daniel R. Tauritz

## *Full Curriculum Vitae*

Department of Computer Science  
Missouri University of Science and Technology<sup>1</sup>  
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## Research Vision

Artificial Intelligence approaches to complex real-world problem solving with an emphasis on National Security problems in areas such as Cyber Security, Cyber Physical Systems, Critical Infrastructure Protection, and Program Understanding. Current emphasized approaches:

- I** Computational Game Theory employing Coevolutionary Algorithms for identifying high-consequence adversarial strategies and corresponding defense strategies.
- II** Hyper-heuristics employing Evolutionary Computation for the Automated Design of Algorithms tailored for high-performance on targeted problem classes.

## Education

Leiden University, Leiden, The Netherlands

- Ph.D. in Computer Science (2002)  
Dissertation title: “Adaptive Information Filtering: concepts and algorithms”  
Advisors: Joost N. Kok and Ida G. Sprinkhuizen-Kuyper
- Master of Science in Computer Science (1996)
- Propaedeutic in Computer Science (1992) and Mathematics (1992)

## Research Appointments

- 4/2012-** Los Alamos National Laboratory (LANL), Los Alamos, New Mexico, U.S.A.
  - 5/2014-** University Collaboration Scientist, A-4: Advanced Research in Cyber Systems
  - 3/2013-** Academic Director, LANL/S&T Cyber Security Sciences Institute (CSSI)
  - 4/2012-4/2014** Guest Scientist
- 5/2005-** Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
  - 8/1/2015-** Contract Scientist, Department 05838 - Cyber Initiatives
  - 9/1/2014-7/31/2015** Sabbatical Faculty, Department 05631 - Threat Analysis Technologies
  - 5/2005-8/2005** Summer Faculty, Center for Cyber Defenders
- 3/1996-11/1996** NATO C3 Agency<sup>2</sup>, The Hague, The Netherlands
  - 9/1996-11/1996** Research Contractor
  - 3/1996-8/1996** Graduate Research Intern

## Academic Appointments

- 8/2002-** Missouri University of Science and Technology (Missouri S&T)<sup>1</sup>, Rolla, Missouri, U.S.A.
  - 7/2016-** Associate Chair for Undergraduate Studies and Outreach Activities, Department of Computer Science
  - 12/2014-** Associate Professor Courtesy Joint Appointment, Department of Electrical and Computer Engineering

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<sup>1</sup>formerly University of Missouri-Rolla (UMR)

<sup>2</sup>since 2012 part of the NATO Communications and Information Agency

- 1/1/2014-6/30/2014** Associate Chair for Undergraduate Studies and Outreach Activities, Department of Computer Science [stepped down due to sabbatical]  
**9/2008-** Associate Professor of Computer Science with Tenure  
**5/2008-** Investigator in the Energy Research & Development Center (ERDC)  
**7/2006-** Research Investigator in the Intelligent Systems Center (ISC)  
**10/2002-** Director of the Natural Computation Laboratory (NC-LAB)  
**8/2002-8/2008** Assistant Professor of Computer Science  
**2/2005-6/2006** Affiliated Member of the Intelligent Systems Center (ISC)  
**4/1997-12/1997** Instructor of Computer Science, University of South Alabama, Mobile, Alabama, U.S.A.  
**9/1994-12/2001** Leiden University, Leiden, The Netherlands  
**12/1997-12/2001** Research Associate in Computer Science  
**9/1995-12/1995** Graduate Teaching Assistant in Computer Science  
**9/1994-12/1994** Graduate Teaching Assistant in Computer Science

## Summary of Major Research Accomplishments

- Grants & Contracts Funding Summary<sup>3</sup>
  - Grand Total (PI & Co-PI): \$4,381,446 (shared credit: \$2,168,551)
  - PI Total: \$1,746,676
- Established research, workforce training, and recruiting relationships with Los Alamos National Laboratory (LANL), first as a LANL Guest Scientist and subsequently as a LANL University Collaboration Scientist. Co-founded the LANL/S&T Cyber Security Sciences Institute (CSSI) in 2013 which has received \$1,028K so far in research contracts<sup>3</sup>. The CSSI research is focused on solving complex security problems inherent to enterprise computer networks employing computational intelligence approaches, including coevolutionary approximations of game theory and novel hyper-heuristic techniques. Gave invited talks at LANL in 2012 & 2013.
- Established research, education, and recruiting relationships with Sandia National Laboratories, first as Summer Faculty in Sandia's Center for Cyber Defenders, subsequently as S&T's campus coordinator for Sandia's recruiting efforts, in Academic Year 2014-2015 as Sabbatical Faculty in residence at Sandia, and continuing as contract scientist. Received \$545K so far in research contracts for research spanning computational intelligence techniques applied to cyber security and critical infrastructure protection and hyper-heuristics for automated algorithm design and automated code targeting for diverse computational architectures. Gave invited talks at Sandia in 2005, 2012, 2013, 2014, and 2015.
- Founded the Natural Computation Laboratory (NC-LAB) which since its founding in 2002 has concentrated on the development of novel types of Evolutionary Algorithms (EAs) and hyper-heuristics, and their application to real-world problems, in particular in the area of cyber security. The bulk of the NC-LAB funding has come from Sandia National Laboratories (SNL), Los Alamos National Laboratory (LANL), and the National Science Foundation (NSF). This is a controlled access lab for performing export controlled research. The vast majority of the lab's contracts from Sandia and LANL have been export controlled.
- Assumed leadership roles in the ACM SIGEVO community, as Late Breaking Papers Chair at the 2010 ACM SIGEVO Genetic and Evolutionary Computation Conference (GECCO 2010),

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<sup>3</sup>including \$484K pending contract from Los Alamos National Laboratory

Genetic Algorithms Track Co-Chair at GECCO 2012 & 2013, co-founder of the Combinatorial Black Box Optimization Competition (CBBOC), first held at GECCO 2015 and repeated at GECCO 2016, co-chair of the Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) held at GECCO since 2015, co-chair of the 2nd Workshop on Metaheuristic Design Patterns (MetaDecP) at GECCO 2015, and co-instructor of the Hyperheuristics Tutorial offered annually at GECCO since 2015.

- Granted on 11/29/2011, together with co-inventor Ray Luechtefeld, US patent 8,069,131 for an NSF funded virtual facilitation research project, namely an artificially intelligent rule-based system to assist teams or groups in becoming more effective by improving the communication process between members of the team or group. The system helps members share information, negotiate more effectively and make better group decisions. The system is designed to allow users to generate dialog interventions and rule sets which are then vetted by all users of the system.

### Summary of Major Awards

- Received Missouri S&T Outstanding Teaching Awards for Academic Years 2017-2018, 2016-2017, 2010-2011, 2007-2008, and 2006-2007<sup>4</sup>.
- Received Missouri S&T 2014 Faculty Service Award.
- Received Missouri S&T's Global Learning 2012 Outstanding Teaching Commendation Award.

### Funding

*Grants & Contracts - sorted by end date*

- “LANL/Missouri University of Science and Technology Cyber Security Sciences Institute” (PI, 100% credit), \$484,000, 2/1/2019-9/30/2023, Los Alamos National Laboratory<sup>5</sup>.
- “Hyper-heuristics for solving real-world problems on diverse computational architectures” (PI, 100% credit), \$226,000, 10/1/2014-9/30/2019, Sandia National Laboratories.
- “Scalable Automated Tailoring of SAT Solvers” (PI, 100% credit), \$7,500, 2018-2019 academic year, Computer Research Association's Committee on the Status of Women in Computing Research. *Direct payment from CRA of student stipends and travel reimbursement.*
- “RFID – In Plant Location Tracking” (Co-PI, 50% credit), \$80,000, 1/17/2019-8/30/2019, Kansas City National Security Campus (with Jagannathan Sarangapani).
- “LANL/Missouri University of Science and Technology Cyber Security Sciences Institute” (PI, 100% credit), \$466,000, 10/1/2013-12/31/2018, Los Alamos National Laboratory.
- “Computational Intelligence Techniques for Situational Awareness in Computing Networks” (PI, 100% credit), \$299,680, 11/4/2011-9/30/2014, Sandia National Laboratories.
- “Peer to Peer Infrastructure Security” (Co-PI, 10% credit), \$2,669, 9/11/2013-9/10/2014, National Security Agency (with Bruce McMillin et al).
- “LANL/Missouri University of Science and Technology Cyber Security Sciences Institute” (PI, 100% credit), \$78,034, 3/7/2013-9/30/2013, Los Alamos National Laboratory.

<sup>4</sup>at the time of the 2006-2007 Outstanding Teaching Award, Missouri S&T was known as University of Missouri-Rolla

<sup>5</sup>contract pending

- “Common Correctness for Protecting Confidentiality of Critical Infrastructure Systems” (Co-PI, 10% shared credit), \$41,250, 8/31/2011-11/30/2012, National Security Agency (with Bruce McMillin and Sahra Sedighsarvestani).
- “Computational Intelligence Techniques for Virtual Facilitation” (PI, 100% credit), \$57,066, 6/1/2011-8/15/2012, University of La Verne.
- “Automated Partial Credit Grading: Demonstration Project” (PI, 50% credit), \$12,000, 2011-2012 academic year, Computer Research Association’s Committee on the Status of Women in Computing Research (with Matt Insall). *Direct payment from CRA of student stipends and travel reimbursement.*
- “Common Correctness for Protecting Confidentiality of Critical Infrastructure Systems” (Co-PI, 10% shared credit), \$115,133, 9/13/2010-12/12/2011, National Security Agency (with Bruce McMillin, Ann Miller and Sahra Sedighsarvestani).
- “Attack and Event Representation in Electric Power Transmission Systems” (PI, 100% credit), \$5,000, 8/22/2011-9/30/2011, Sandia National Laboratories.
- “Computational Intelligence Techniques for Malware Classification” (PI, 100% credit), \$39,996, 1/15/2011-8/15/2011, Sandia National Laboratories.
- “A GPU-based High Performance Computing Cluster for Multiple Military Modeling Capabilities” (Co-PI, 25% shared credit), \$150,000, 5/12/2009-5/11/2011, Department of Defense - Air Force Office of Scientific Research (with Donald Wunsch, Sanjeev Agarwal, and Ganesh Venayagamoorthy).
- “Common Correctness for Protecting Confidentiality of Critical Infrastructure Systems” (Co-PI, 15% shared credit), \$28,006, 9/10/2009-12/31/2010, National Security Agency (with Bruce McMillin, Ann Miller and Sahra Sedighsarvestani).
- “Common Correctness for Protecting Confidentiality of Critical Infrastructure Systems” (Co-PI, 15% shared credit), \$32,998, 9/8/2008-9/7/2009, National Security Agency (with Bruce McMillin, Ann Miller and Sahra Sedighsarvestani).
- “A Program to Facilitate Scholastic Achievement in Computer Science, Engineering, and Mathematics” (Co-PI, 45% shared credit), \$225,464, 8/15/2004-7/31/2009, NSF (with Jennifer Leopold and Harvest Collier).
- “Computer Science Recruitment for the 21st Century: Phase III” (PI, 100% credit), \$9,500, 2008-2009 academic year, Computer Research Association’s Committee on the Status of Women in Computing Research. *Direct payment from CRA of student stipends and supplies/travel reimbursement.*
- “Indoor Air Quality Simulator with Lab Interface and Interactive Consumer Interface” (PI, 50% shared credit), \$22,500, 2007-2008 academic year, Computer Research Association’s Committee on the Status of Women in Computing Research (with Glenn Morrison). *Direct payment from CRA of student stipends and supplies/travel reimbursement.*
- “Computer Science Recruitment for the 21st Century” (PI, 100% credit), \$9,500, 2007-2008 academic year, Computer Research Association’s Committee on the Status of Women in Computing Research. *Direct payment from CRA of student stipends and supplies/travel reimbursement.*

- “The Study and Reduction of the Deleterious Effects on Interacting Power Control Devices” (Co-PI, 12% shared credit), \$680,859, 5/1/2006-4/30/2007, Sandia National Laboratories (with Mariesa Crow, Bruce McMillin, Frank Liu, Badrul Chowdhury and Jag Sarangapani).
- “Computer Science Recruitment in the 21st Century: Improving the image of Computer Science with 6th graders, especially females” (PI, 100% credit), \$6,500, 2006-2007 academic year, Computer Research Association’s Committee on the Status of Women in Computing Research. *Direct payment from CRA of student stipends and supplies/travel reimbursement.*
- “Interconnected Laboratory Scale FACTS Devices” (Co-PI, 12% shared credit), \$1,278,391, 4/15/2005-4/30/2006, Sandia National Laboratories (with Mariesa Crow, Bruce McMillin, Frank Liu, Badrul Chowdhury and Jag Sarangapani).
- “Computational Intelligence Enhanced Intrusion Detection” (PI, 100% credit), \$23,400, 1/1/2003-12/31/2003, University of Missouri Research Board.

### Donations Obtained

- Spring Semester 2018: \$1,000 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Fall Semester 2016: \$650 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Spring Semester 2016: \$650 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Spring Semester 2014: \$600 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Fall Semester 2013: \$100 support for prizes for a semester long competition in CS 128 - Discrete Mathematics for Computer Science from Sandia National Laboratories
- Spring Semester 2013: \$550 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Fall Semester 2012: \$100 support for prizes for a semester long competition in CS 128 - Discrete Mathematics for Computer Science from Carfax
- Spring Semester 2012: \$500 support for Artificial Intelligence Tournament from Sandia National Laboratories
- Fall Semester 2008: NVIDIA Tesla GPGPU cards from NVIDIA
- Spring Semester 2005: Prizes for AI Tournament from Network Appliance
- Fall Semester 2004: Prizes for AI Tournament from Microsoft
- Fall Semester 2003: Prizes for AI Tournament from Microsoft

## Publication Record

for additional meta-data and download links, see <https://web.mst.edu/~tauritzd/papers.html>

## Refereed Publications

1. Aaron S. Pope, Daniel R. Tauritz and Alexander D. Kent. Evolving Bipartite Authentication Graph Partitions. *IEEE Transactions on Dependable and Secure Computing*, 16(1):58-71, January/February 2019.
2. David Curry, Cihan Dagli, Daniel Tauritz. An Evolutionary Algorithm for Many-Objective Optimization Emphasizing Decision Making. Under minor revision, *IEEE Systems Journal*.
3. Kevin Schoonover, Eric Michalak, Sean Harris, Adam Gausmann, Hannah Reinbolt, Daniel R. Tauritz, Chris Rawlings, Aaron Scott Pope. Galaxy: A Network Emulation Framework for Cybersecurity. In *Proceedings of the 11th USENIX Workshop on Cyber Security Experimentation and Test (CSET '18)*, Baltimore, MD, U.S.A., August 13, 2018.
4. Aaron Scott Pope, Robert Morning, Daniel R. Tauritz, and Alexander Kent. Automated Design of Network Security Metrics. In *Proceedings of the 20th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '18)*, pages 1680–1687, Kyoto, Japan, July 15-19, 2018.
5. Sean Harris, Eric Michalak, Kevin Schoonover, Adam Gausmann, Hannah Reinbolt, Joshua Herman, Daniel R. Tauritz, Chris Rawlings, and Aaron Scott Pope. Evolution of Network Enumeration Strategies in Emulated Computer Networks. In *Proceedings of the 20th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '18)*, pages 1640–1647, Kyoto, Japan, July 15-19, 2018.
6. Samuel N. Richter and Daniel R. Tauritz. The Automated Design of Probabilistic Selection Methods for Evolutionary Algorithms. In *Proceedings of the 20th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '18)*, pages 1545–1552, Kyoto, Japan, July 15-19, 2018.
7. Marketa Illetszkova, Alex R. Bertels, Joshua M. Tuggle, Adam Harter, Samuel Richter, Daniel R. Tauritz, Samuel Mulder, Denis Bueno, Michelle Leger and William M. Siever. Improving Performance of CDCL SAT Solvers by Automated Design of Variable Selection Heuristics. In *Proceedings of the 2017 IEEE Symposium Series on Computational Intelligence (SSCI 2017)*, Honolulu, Hawaii, U.S.A., November 27 - December 1, 2017.
8. Islam Elnabarawy, Daniel R. Tauritz and Donald C. Wunsch. Evolutionary Computation for the Automated Design of Category Functions for Fuzzy ART: An Initial Exploration. In *Proceedings of the 19th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '17)*, pages 1133–1140, Berlin, Germany, July 15-19, 2017.
9. Adam Harter, Daniel R. Tauritz and William M. Siever. Asynchronous Parallel Cartesian Genetic Programming. In *Proceedings of the 19th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '17)*, pages 1820–1824, Berlin, Germany, July 15-19, 2017.
10. Aaron S. Pope, Daniel R. Tauritz and Alexander D. Kent. Evolving Random Graph Generators: A Case for Increased Algorithmic Primitive Granularity. In *Proceedings of the 2016 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2016)*, Athens, Greece, December 6-9, 2016.

11. Aaron S. Pope, Daniel R. Tauritz and Alexander D. Kent. Evolving Multi-level Graph Partitioning Algorithms. In *Proceedings of the 2016 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2016)*, Athens, Greece, December 6-9, 2016.
12. Alex R. Bertels and Daniel R. Tauritz. Why Asynchronous Parallel Evolution is the Future of Hyper-heuristics: A CDCL SAT Solver Case Study. In *Proceedings of the 18th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '16)*, pages 1359–1365, Denver, Colorado, July 20-24, 2016.
13. Matthew A. Martin and Daniel R. Tauritz. Hyper-Heuristics: A Study On Increasing Primitive-Space. In *Proceedings of the 17th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '15)*, pages 1051–1058, Madrid, Spain, July 11–15, 2015.
14. Sean Harris, Travis Bueter, and Daniel R. Tauritz. A Comparison of Genetic Programming Variants for Hyper-Heuristics. In *Proceedings of the 17th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '15)*, pages 1043–1050, Madrid, Spain, July 11–15, 2015.
15. George Rush, Daniel R. Tauritz, and Alexander D. Kent. Coevolutionary Agent-based Network Defense Lightweight Event System (CANDLES). In *Proceedings of the 17th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '15)*, pages 859–866, Madrid, Spain, July 11–15, 2015.
16. Matthew A. Martin, Alex R. Bertels, and Daniel R. Tauritz. Asynchronous Parallel Evolutionary Algorithms: Leveraging Heterogeneous Fitness Evaluation Times for Scalability and Elitist Parsimony Pressure. In *Proceedings of the 17th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '15)*, pages 1429–1430, Madrid, Spain, July 11–15, 2015.
17. Jasenko Husic, Daniel R. Tauritz, and Samuel A. Mulder. Evolving Decision Trees for the Categorization of Software. In *Proceedings of the 38th IEEE Annual Computers, Software and Applications Conference Workshops (COMPSACW '14)*, pages 337–342, Västerås, Sweden, July 21–25, 2014.
18. George Rush, Daniel R. Tauritz, and Alexander D. Kent. DCAFE: A Distributed Cyber Security Automation Framework for Experiments. In *Proceedings of the 38th IEEE Annual Computers, Software and Applications Conference Workshops (COMPSACW '14)*, pages 134–139, Västerås, Sweden, July 21–25, 2014.
19. Matthew A. Martin and Daniel R. Tauritz. A Problem Configuration Study of the Robustness of a Black-Box Search Algorithm Hyper-Heuristic. In *Proceedings of the 16th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '14)*, pages 1389–1396, Vancouver, BC, Canada, July 12–16, 2014.
20. Matthew A. Martin and Daniel R. Tauritz. Multi-Sample Evolution of Robust Black-Box Search Algorithms. In *Proceedings of the 16th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '14)*, pages 195–196, Vancouver, BC, Canada, July 12–16, 2014.
21. Jeffery Shelburg, Marouane Kessentini and Daniel Tauritz. Regression Testing for Model Transformations: A Multi-Objective Approach. In *Proceedings of the 5th Symposium on Search-Based Software Engineering (SSBSE 2013)*, pages 209-223, St. Petersburg, Russia, August 24–26, 2013.
22. Nathaniel R. Kamrath and Brian W. Goldman and Daniel R. Tauritz. Using Supportive Co-evolution to Evolve Self-Configuring Crossover. In *Proceedings of the 15th Annual Conference*

- Companion on Genetic and Evolutionary Computation (GECCO '13)*, pages 1489–1496, Amsterdam, The Netherlands, July 6–10, 2013.
23. Matthew A. Martin and Daniel R. Tauritz. Evolving Black-Box Search Algorithms Employing Genetic Programming. In *Proceedings of the 15th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '13)*, pages 1497–1504, Amsterdam, The Netherlands, July 6–10, 2013.
  24. Mohamed Mkaouer, Marouane Kessentini, Slim Bechikh, Daniel Tauritz. Preference-Based Multi-objective Software Modelling. In *Proceedings of the 1st International Workshop on Combining Modelling and Search-Based Software Engineering (CMSBSE 2013) - an International Conference on Software Engineering 2013 (ICSE 2013) workshop*, San Francisco, U.S.A., May 18–26, 2013.
  25. Brian W. Goldman and Daniel R. Tauritz. Linkage Tree Genetic Algorithms: Variants and Analysis. In *Proceedings of the 14th Annual Conference on Genetic and Evolutionary Computation (GECCO '12)*, pages 625–632, Philadelphia, U.S.A., July 7–11, 2012.
  26. Josh L. Wilkerson, Daniel R. Tauritz, and James Bridges. Multi-Objective Coevolutionary Automated Software Correction System. In *Proceedings of the 14th Annual Conference on Genetic and Evolutionary Computation (GECCO '12)*, pages 1229–1236, Philadelphia, U.S.A., July 7–11, 2012.
  27. Brian W. Goldman and Daniel R. Tauritz. Supportive Coevolution. In *Proceedings of the 14th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '12)*, pages 59–66, Philadelphia, U.S.A., July 7–11, 2012.
  28. Lisa M. Guntly and Daniel R. Tauritz. Learning Individual Mating Preferences. In *Proceedings of the 13th Annual Conference on Genetic and Evolutionary Computation (GECCO '11)*, pages 1069–1076, Dublin, Ireland, July 12–16, 2011.
  29. Brian W. Goldman and Daniel R. Tauritz. Self-Configuring Crossover. In *Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '11)*, pages 575–582, Dublin, Ireland, July 12–16, 2011.
  30. Brian W. Goldman and Daniel R. Tauritz. Meta-Evolved Empirical Evidence of the Effectiveness of Dynamic Parameters. In *Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '11)*, pages 155–156, Dublin, Ireland, July 12–16, 2011.
  31. Josh L. Wilkerson and Daniel R. Tauritz. Scalability of the Coevolutionary Automated Software Correction System. In *Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '11)*, pages 243–244, Dublin, Ireland, July 12–16, 2011.
  32. Josh L. Wilkerson and Daniel R. Tauritz. A Guide For Fitness Function Design. In *Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '11)*, pages 123–124, Dublin, Ireland, July 12–16, 2011.
  33. Jonathan J. Blount, Daniel R. Tauritz and Samuel A. Mulder. Adaptive Rule-Based Malware Detection Employing Learning Classifier Systems: A Proof of Concept. In *Proceedings of the 35th IEEE Annual Computer Software and Applications Conference Workshops (COMPSACW '11)*, pages 110–115, Munich, Germany, July 18–21, 2011.



34. Jason E. Cook and Daniel R. Tauritz. An Exploration into Dynamic Population Sizing. In *Proceedings of GECCO 2010 - the Genetic and Evolutionary Computation Conference*, pages 807–814, Portland, Oregon, U.S.A., July 7–11, 2010.
35. Josh Wilkerson and Daniel R. Tauritz. Coevolutionary Automated Software Correction. In *Proceedings of GECCO 2010 - the Genetic and Evolutionary Computation Conference*, pages 1391–1392, Portland, Oregon, U.S.A., July 7–11, 2010 (two-page poster abstract).
36. Travis C. Service and Daniel R. Tauritz. Increasing Infrastructure Resilience Through Competitive Coevolution. *New Mathematics and Natural Computation*, 5(2):441–457, July 2009.
37. Travis C. Service and Daniel R. Tauritz. Free Lunches in Pareto Coevolution. In *Proceedings of GECCO 2009 - the Genetic and Evolutionary Computation Conference*, pages 1721–1728, Montreal, Canada, July 8–12, 2009. **Nominated for best theory track paper award.**
38. André Nwamba and Daniel R. Tauritz. Futility-Based Offspring Sizing. In *Proceedings of GECCO 2009 - the Genetic and Evolutionary Computation Conference*, pages 1873–1874, Montreal, Canada, July 8–12, 2009 (two-page poster abstract).
39. Jennifer Leopold and Daniel Tauritz. An Interactive Student-Driven Program to Facilitate Scholastic Achievement in Computer Science, Engineering, and Mathematics. In *Proceedings of the American Society for Engineering Education Annual Conference & Exposition*, Austin, Texas, U.S.A., June 14–17, 2009.
40. Travis C. Service and Daniel R. Tauritz. A No-Free-Lunch Framework for Coevolution. In *Proceedings of GECCO 2008 - the Genetic and Evolutionary Computation Conference*, pages 371–378, Atlanta, Georgia, U.S.A., July 12–16, 2008.
41. Ekaterina A. Holdener and Daniel R. Tauritz. Learning Offspring Optimizing Mate Selection. In *Proceedings of GECCO 2008 - the Genetic and Evolutionary Computation Conference*, pages 1109–1110, Atlanta, Georgia, U.S.A., July 12–16, 2008 (two-page poster abstract).
42. Travis C. Service and Daniel R. Tauritz. Co-Optimization Algorithms. In *Proceedings of GECCO 2008 - the Genetic and Evolutionary Computation Conference*, pages 387–388, Atlanta, Georgia, U.S.A., July 12–16, 2008 (two-page poster abstract).
43. William M. Siever, Daniel R. Tauritz, Ann Miller, Mariesa L. Crow, Bruce B. McMillin, and Stanley Atcitty. Symbolic Reduction for High-Speed Power System Simulation. *Simulation: Transactions of the Society for Modeling and Simulation International*, 84(6):297–309, June 2008.
44. Ekaterina A. Smorodkina and Daniel R. Tauritz. Greedy Population Sizing for Evolutionary Algorithms. In *Proceedings of CEC 2007 - IEEE Congress on Evolutionary Computation*, pages 2181–2187, Singapore, September 25–28, 2007.
45. Ekaterina A. Smorodkina and Daniel R. Tauritz. Toward Automating EA Configuration: the Parent Selection Stage. In *Proceedings of CEC 2007 - IEEE Congress on Evolutionary Computation*, pages 63–70, Singapore, September 25–28, 2007.
46. Travis Service, Daniel R. Tauritz and William M. Siever. Infrastructure Hardening: A Competitive Coevolutionary Methodology Inspired by Neo-Darwinian Arms Races. In *Proceedings of COMPSAC 2007: the 31st IEEE Computers, Software, and Applications Conference*, pages 101–104, Beijing, China, July 23–27, 2007.

47. Matt Johnson, Daniel R. Tauritz, Ralph Wilkerson. SNDL-MOEA: Stored Non-Domination Level MOEA. In *Proceedings of GECCO 2007 - the Genetic and Evolutionary Computation Conference*, pages 837–844, London, UK, July 7–11, 2007. **Nominated for best multi-objective optimization track paper award.**
48. William M. Siever, Ann Miller and Daniel R. Tauritz. Improving Grid Fault Tolerance by Optimal Control of FACTS Devices. *International Journal of Innovations in Energy Systems and Power*, 2(1):44–49, June 2007.
49. Ekaterina A. Smorodkina, Mayur Thakur and Daniel R. Tauritz. Algorithms for the Balanced Edge Partitioning Problem. In *Proceedings of WEA 2007 - the 6th Workshop on Experimental Algorithms*, pages 311–323, Rome, Italy, June 6–9, 2007.
50. William M. Siever, Ann Miller and Daniel R. Tauritz. Blueprint for Iteratively Hardening Power Grids employing Unified Power Flow Controllers. In *Proceedings of IEEE SoSE 2007 - the 2nd International Conference on System of Systems Engineering*, pages 1–7, San Antonio, Texas, April 16–18, 2007.
51. Radha P. Kalyani and Mariesa L. Crow and Daniel R. Tauritz. Optimal Placement and Control of Unified Power Flow Control devices using Evolutionary Computing and Sequential Quadratic Programming. In *Proceedings of the 2006 IEEE PES Power Systems Conference & Exposition - PSCE2006*, pages 959–964, Atlanta, Georgia, October 29 - November 1, 2006.
52. Ekaterina A. Smorodkina and Daniel R. Tauritz. Power Grid Protection Through Rapid Response Control of FACTS Devices, In *Proceedings of the International Workshop on Complex Network and Infrastructure Protection - CNIP 2006*, pages 441–450, Rome, Italy, March 28–29, 2006.
53. William M. Siever, Daniel R. Tauritz and A. Miller. Improving grid fault tolerance by optimal control of FACTS devices. In *Proceedings of First International ICSC Symposium on Artificial Intelligence in Energy Systems and Power - AIESP 2006, CD only proceedings with no page numbers*, Madeira, Portugal, February 7–10, 2006.
54. John Chaloupek, Daniel R. Tauritz, B. McMillin and M.L. Crow. Evolutionary Optimization of Flexible AC Transmission System Device Placement for Increasing Power Grid Reliability. In *Proceedings of FEA 2005, the 6th International Workshop on Frontiers in Evolutionary Algorithms*, pages 516–519, Salt Lake City, Utah, July 21–26, 2005.
55. Timothy Rupe, Jennifer Leopold, Anne Maglia and Daniel R. Tauritz. Evolutionary Optimization of Filter Parameters for Image Segmentation. In *Proceedings of FEA 2005, the 6th International Workshop on Frontiers in Evolutionary Algorithms*, pages 511–515, Salt Lake City, Utah, U.S.A., July 21–26, 2005.
56. Daniel R. Tauritz, Joost N. Kok, and Ida G. Sprinkhuizen-Kuyper. Adaptive information filtering using evolutionary computation. *Information Sciences*, 122(2–4):121–140, February 2000.
57. Daniel R. Tauritz and Ida G. Sprinkhuizen-Kuyper. Adaptive information filtering: evolutionary computation and  $n$ -gram representation. In *Proceedings of the Twelfth Belgium-Netherlands Artificial Intelligence Conference*, pages 157–164, 2000.
58. Daniel R. Tauritz and Ida G. Sprinkhuizen-Kuyper. Adaptive information filtering algorithms. In David J. Hand, Joost N. Kok, and Michael R. Berthold, editors, *Advances in Intelligent Data Analysis, Third International Symposium, IDA-99*, volume 1642 of *Lecture Notes in Computer Science*, pages 513–524. Springer-Verlag, 1999.

59. Daniel R. Tauritz, Ida G. Sprinkhuizen-Kuyper, and Joost N. Kok. Evolutionary computation applied to adaptive information filtering. In *Proceedings of the Ninth Dutch Conference on Artificial Intelligence (NAIC'97)*, pages 17–26, 1997.
60. Daniel R. Tauritz, Joost N. Kok, and Ida G. Sprinkhuizen-Kuyper. Adaptive information filtering using evolutionary computation. In *Proceedings of the Third Joint Conference on Information Sciences (JCIS'97)*, volume 1, pages 77–80, March 1997.

### Other Conference Papers

- David Andrew Cape and Daniel R. Tauritz. Probabilistically Interpolated Rational Hypercube Landscape Evolutionary Algorithm. In *Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '11)*, pages 807–808, Dublin, Ireland, July 12–16, 2011.
- William M. Siever, R.P. Kalyani, Mariesa L. Crow and Daniel R. Tauritz. UPFC control employing Gradient Descent Search. In *Proceedings of the 37th Annual North American Power Symposium*, pages 379–382, Ames, Iowa, U.S.A., October 23–25, 2005.
- Alex J. Berry, Daniel R. Tauritz and Michael Hilgers. Evolving Intelligent Agents for First Responder Training Simulation. In *Smart Engineering System Design: Neural Networks, Fuzzy Logic, Evolutionary Programming, Complex Systems and Artificial Life – Volume 14 – Proceedings of the Artificial Neural Networks In Engineering Conference – ANNIE 2004*, pages 177–182, St. Louis, Missouri, U.S.A., November 7–10, 2004.
- Matt Johnson, Daniel R. Tauritz and Ralph W. Wilkerson. Evolutionary Computation Applied to Melody Generation. In *Smart Engineering System Design: Neural Networks, Fuzzy Logic, Evolutionary Programming, Complex Systems and Artificial Life – Volume 14 – Proceedings of the Artificial Neural Networks In Engineering Conference – ANNIE 2004*, pages 307–312, St. Louis, Missouri, U.S.A., November 7–10, 2004.

### Position Papers & Tutorials

- Daniel R. Tauritz and John R. Woodward. Hyper-Heuristics. In *Proceedings of the 20th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '18)*, pages 685–719, Kyoto, Japan, July 15–19, 2018. [TUTORIAL]
- Daniel R. Tauritz and John R. Woodward. Hyper-Heuristics. In *Proceedings of the 19th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '17)*, pages 510–544, Berlin, Germany, July 15–19, 2017. [TUTORIAL]
- Daniel R. Tauritz and John R. Woodward. Hyper-Heuristics. In *Proceedings of the 18th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '16)*, pages 273–304, Denver, Colorado, U.S.A., July 20–24, 2016. [TUTORIAL]
- John R. Woodward and Daniel R. Tauritz. Hyper-Heuristics. In *Proceedings of the 17th Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '15)*, pages 199–230, Madrid, Spain, July 11–15, 2015. [TUTORIAL]
- Bruce McMillin, C. Gill, M. L. Crow, F. Liu, D. Niehaus, A. Potthast, and Daniel R. Tauritz. Cyber-Physical Systems Distributed Control: The Advanced Electric Power Grid. National Workshop on Beyond SCADA: Networked Embedded Control for Critical Physical Systems (HCSS:NEC4CPS), Pittsburgh, PA, U.S.A., November 8–9, 2006.

- Bruce McMillin, C. Gill, M. L. Crow, F. Liu, D. Niehaus, A. Potthast, and Daniel R. Tauritz. Cyber-Physical Systems Engineering: The Advanced Power Grid. NSF Workshop on Cyber-Physical Systems: Research Motivation, Techniques and Roadmap, Austin, TX, U.S.A., October 16–17, 2006.
- Mariesa L. Crow, C. Gill, F. Liu, B. McMillin, D. Niehaus, and Daniel R. Tauritz. Engineering the Advanced Power Grid: Research Challenges and Tasks. Workshop on Research Directions for Security and Networking in Critical Real-Time and Embedded Systems - CRTES06, San Jose, California, U.S.A., April 4, 2006.
- Bruce McMillin, Mariesa L. Crow, Daniel R. Tauritz, F Liu, B Chowdhury and J Sarangapani. Improving Power Transmission Efficiency and Reliability through Hardware/Software Co-Design. Second Carnegie Mellon Conference in Electric Power Systems: Monitoring, Sensing, Software and Its Valuation for the Changing Electric Power Industry, Pittsburgh, Pennsylvania, January 11–12, 2006.

### Technical Reports

- Stephen T. Jones, Alexander V. Outkin, Jared Lee Gearhart, Jacob Aaron Hobbs, John Daniel Siirola, Cynthia A. Phillips, Stephen Joseph Verzi, Daniel Tauritz, Samuel A. Mulder, Asmeret Bier Naugle. PLADD: Detering Attacks on Cyber Systems and Moving Target Defense. Technical Report SAND2017-0412C, Sandia National Laboratories, 2017.
- Jared Lee Gearhart, Jacob Aaron Hobbs, Stephen T. Jones, Samuel A. Mulder, Asmeret Bier Naugle, Alexander V. Outkin, Cynthia A. Phillips, John Daniel Siirola, Daniel Tauritz, Stephen Joseph Verzi. A New Scheduling Problem Motivated by Moving-target Cyberdefense. Technical Report SAND2016-2709C, Sandia National Laboratories, 2016.
- Stephen Jones, Alexander Outkin, Jared Gearhart, Jacob Hobbs, John Siirola, Cindy Phillips, Stephen Verzi, Daniel Tauritz, Samuel Mulder, Asmeret Naugle. Evaluating Moving Target Defense with PLADD. Technical Report SAND2015-8432R, Sandia National Laboratories, 2015.
- Daniel R. Tauritz. Adaptive Information Filtering: concepts and algorithms. Ph.D. dissertation, Leiden University, 2002, ISBN 90-9015926-6.
- Daniel R. Tauritz and Ida G. Sprinkhuizen-Kuyper. Adaptive information filtering: improvement of the matching technique and derivation of the evolutionary algorithm. Technical Report 99-04, Leiden University, 1999.
- Daniel R. Tauritz. Adaptive information filtering as a means to overcome information overload. Master's thesis, Leiden University, 1996.
- Daniel R. Tauritz. Concepts of adaptive information filtering. Technical Report 96-19, Leiden University, 1996.
- Daniel R. Tauritz. Optimization of the discriminatory power of a trigram based document clustering algorithm using evolutionary computation. Technical Report 96-5, Leiden University, 1996.
- Lucien G. Heins and Daniel R. Tauritz. Adaptive Resonance Theory (ART): An introduction. Technical Report 95-35, Leiden University, 1995.

**Invited Talks**

- 12/5/2018** “Artificial Intelligence Approaches for Wickedly Hard National Security Problems”, Computer Science Colloquium Series Fall 2018, University of New Mexico, Albuquerque, New Mexico, U.S.A.
- 4/17/2018** “Computational Intelligence Approaches for Wickedly Hard National Security Problems”, NNSA’s Kansas City National Security Campus, Kansas City, Missouri, U.S.A.
- 6/4/2015** “A Tutorial on Hyper-Heuristics for the Automated Design of Algorithms”, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 6/5/2014** “Hyper-heuristics for the Tunable Automated Design of Custom Algorithms”, Department 1461 Tech Meeting, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 7/31/2013** “Automated Real-World Problem Solving: Navigating The Meta-Heuristical Black-Box Optimization Tapestry”, Information Science and Technology Institute Seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, U.S.A.
- 7/22/2013** “Automated Real-World Problem Solving: Navigating The Meta-Heuristical Black-Box Optimization Tapestry”, Cyber Engineering Research Institute Seminar, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 7/12/2013** “Automated Real-World Problem Solving: A Meta-Heuristical Black-Box Optimization Tapestry”, Donders Institute, Radboud University Nijmegen, The Netherlands
- 7/5/2013** “Automated Real-World Problem Solving: Navigating The Meta-Heuristical Black-Box Optimization Tapestry”, Leiden Institute of Advanced Computer Science, Leiden, The Netherlands
- 7/30/2012** “Evolutionary Computing 101”, Cyber Engineering Research Institute Seminar, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 7/30/2012** “Grand Challenges in Evolutionary Computing”, Cyber Engineering Research Institute Seminar, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 7/30/2012** “Automated Software Testing & Correction employing Evolutionary Computing and with potential Cyber Security applications”, Cyber Engineering Research Institute Seminar, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 7/24/2012** “Evolutionary Computing 101”, Center for Nonlinear Studies Seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, U.S.A.
- 7/24/2012** “Grand Challenges in Evolutionary Computing”, Center for Nonlinear Studies Seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, U.S.A.
- 7/24/2012** “Current Research in EC: Linkage Learning in Evolutionary Algorithms and Automated Software Testing & Correction employing Evolutionary Computing”, Center for Nonlinear Studies Seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, U.S.A.
- 3/2009** “Grand Challenges in Evolutionary Computing”, Computer Science Colloquium, Iowa State University, Ames, Iowa, U.S.A.
- 11/2008** “New Directions in Parameterless Evolutionary Algorithms”, Symposium on New Directions in Evolutionary Algorithms, Donders Centre for Cognition, Radboud University Nijmegen, The Netherlands

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- 11/2008** Introduction to, and Experimental Research in, Evolutionary Algorithms, Workshop, Donders Centre for Cognition, Radboud University Nijmegen, The Netherlands
- 3/2008** “A Co-Evolutionary Armsrace Methodology for Improving Cyber-Physical System Robustness - Distributed Power Electronics Devices”, Fourth Annual Carnegie Mellon Conference on the Electricity Industry: Future Energy Systems: Efficiency, Security, Control, Carnegie Mellon University, Pittsburgh, Pennsylvania, U.S.A.
- 4/2007** “Real-world adversarial game-theoretic problem solving employing competitive coevolutionary armsraces: Critical infrastructure protection & automated software engineering”, University of Missouri-St. Louis, St. Louis, Missouri, U.S.A.
- 3/2005** “How Darwin can help Increase the Robustness of our Nation’s Electrical Power Grid: Evolving A Distributed Agent-Based SCADA System”, Sandia National Laboratories, Albuquerque, New Mexico, U.S.A.
- 10/2004** “How to write grants”, UMR Council of Graduate Students Grant Writing Workshop.
- 4/2004** “Can Darwin save the US electric power grid?”, Truman State University ACM Chapter, Kirksville, Missouri, U.S.A.
- 5/2003** “Natural Computation: computational models inspired by nature”, UMR Bioinformatics Working Group.
- 9/2002** “Applications of  $n$ -grams”, UMR CS Department Colloquium Series.
- 1999** “Methods and Algorithms for Adaptive Information Filtering”, CWI (National Research Institute for Mathematics and Computer Science of the Netherlands), Amsterdam, The Netherlands.
- 1999** “Methods and Algorithms for Adaptive Information Filtering”, University of Maastricht, The Netherlands.
- 1998** “Adaptive Information Filtering”, Symposium on the SION Digital Information Super Highway Theme, Amsterdam, The Netherlands.

## Academic Activities

### *Course Development*

- 2006-2008** Evolutionary Computing (CS 5401/6401 - formerly 348/448) - created a two-course sequence on evolutionary computing, consisting of a senior/graduate introductory course and an advanced, research emphasized, graduate course building on foundations laid in the intro course.
- 2006** Computer Security (CS 483) - completely revamped as an advanced graduate course centered around problem-based learning (PBL) in teams.
- 2004** Discrete Mathematics for Computer Science (CS 1200 - formerly 128/158) - instituted a LEAD Learning Center. In Spring Semester 2005 expanded this Learning Center to all sections and coordinated shared responsibility for it with the other section instructors.
- 2003** Introduction to Artificial Intelligence (CS 5400 - formerly 347) - completely revamped to provide in-depth, hands-on overview of search algorithms and heuristics with a major implementation component in a modern programming language; programming assignments in the second half of a semester progressively prepare the students for the S&T Artificial Intelligence Tournament.
- 2002** Advanced graduate course on Evolutionary Computing (CS 6401 - formerly 448) - provided an introduction to the general theory of Evolutionary Computing followed by individual research projects in which students implemented Evolutionary Algorithms, a number of which led to M.S. theses and conference papers. Besides traditional lectures, in-class case studies were performed in groups, and students gave presentations on their individual research projects.

### *Courses Taught at Missouri University of Science and Technology*

<i>S&amp;T course #</i>	<i>title</i>	<i>year(s) taught</i>
CS 1200 <sup>1</sup>	Discrete Mathematics for Computer Science	2004-2005, 2009-2013, 2015
CS 5401 <sup>2,4</sup>	Evolutionary Computing	2007-2013, 2015-2018
CS 5400 <sup>3,4</sup>	Introduction to Artificial Intelligence	2003-2007, 2009-2014, 2016-2019
CS 401 <sup>4,5</sup>	Cyber Security Research & Development	2006, 2008
CS 6400 <sup>6</sup>	Advanced Topics in Artificial Intelligence	2002,2011,2013
CS 6401 <sup>7</sup>	Advanced Evolutionary Computing	2003-2006, 2008-2010,2012, 2016

<sup>1</sup>formerly CS 128/158, <sup>2</sup>formerly CS 301/348, <sup>3</sup>formerly CS 347 <sup>4</sup>distance section offered, <sup>5</sup>formerly CS 483, <sup>6</sup>formerly CS 447, <sup>7</sup>formerly CS 401/448

### *Courses Taught at University of South Alabama*

<i>title</i>	<i>year(s) taught</i>
Introduction to Scientific Computing in C	1997
Introduction to Scientific Computing in Fortran	1997

*S&T's Academic Administrators Professional Development***1/2017** Faculty Recruitment**11/2016** Leading by Influence**10/2016** Civil Rights and Equity**9/2016** Leveraging University Advancement**8/2016** Policies and Procedures for Academic Administrators*Professional Development***8/2016** Missouri S&T Grievance Panel Training**3/2006** Attended 1st CI2RCO Conference on Critical Information Infrastructure Protection, Rome, Italy**11/2005** Participated in Microsoft's Security Development Lifecycle-Information Technology (SDL-IT) Workshop for Academia, Curriculum/Course Development Workshop, Atlanta, Georgia**4/2005** Attended NSF Regional Grants Conference, Oakland, California**8/2004-** Member of Missouri S&T's On Course Users Workgroup**4/2004** Attended the UM Grantsmanship Day in Columbia, Missouri**8/2003-5/2004** University of Missouri New Faculty Teaching Scholar**5/2003-** Member of Missouri S&T's Promotion & Tenure Writers Group**8/2002-5/2003** Member of Missouri S&T's Freshman Faculty Forum**Students Supervised Summary**

Total number of Ph.D. students graduated	5 <sup>1</sup>
Total number of Ph.D. students active	3
Total number of M.S. thesis students graduated	19 <sup>2</sup>
Total number of M.S. thesis students active	2
Total number of undergraduate research students supervised	65
Total number of undergraduate research students active	6

<sup>1</sup>3 co-supervised, <sup>2</sup>3 co-supervised



**Ph.D. Students Supervised**

Name	Support	Description	Status
Lisa Guntly	NSF GRFP	Age-Based Population Dynamics to Develop Autonomous Evolutionary Algorithms	Dropped Out
Sean Harris	Chancellor's Distinguished Fellowship	Hyper-heuristics for evolving custom learning algorithms for coevolving attacker and defender multi-agent systems	Active
Joshua Herman <sup>1</sup>	SFS <sup>2</sup> Fellowship	Human-imitating agents for cyber security computer network emulations	Switched to M.S.
Ekaterina Holdener née Smorodkina	SNL <sup>3</sup> ,GTA	The Art of Parameterless Evolutionary Algorithms	Graduated 2008
Matt Johnson <sup>1</sup>	GTA	The Stored Non-Domination Level Multi-Objective Evolutionary Algorithm	Graduated 2007
Radha Kalyani <sup>1</sup>	SNL <sup>3</sup> , GTA	Power Informatics: Optimal Control of UPFC devices w/ Sequential Quadratic Programming	Graduated 2007
Aaron Pope	LANL <sup>4</sup>	Evolving Graph Algorithms for Cyber Security	Active
Deacon Seals	ISC <sup>2</sup> ,GTA	Automated Programming of FPGAs Employing Evolutionary Computation	Active
William Siever <sup>1</sup>	SNL <sup>3</sup> , Tang Fellowship, GTA	A Reinforcement Learning approach to controlling UPFC devices	Graduated 2007
Joshua Wilkerson	ISC <sup>2</sup> ,GTA	Coevolutionary Automated Software Engineering	Graduated 2012

<sup>1</sup> *Co-supervised*<sup>2</sup> *Scholarship for Service*<sup>3</sup> *Sandia National Laboratories (<https://www.sandia.gov>)*<sup>4</sup> *Los Alamos National Laboratories (<https://www.lanl.gov/>)*<sup>5</sup> *Intelligent Systems Center (<https://isc.mst.edu>)*

## M.S. Thesis Students Supervised

Name	Support	Description	Status
Monu Bambroo	UMRB <sup>2</sup>	Intrusion Detection using Fuzzy Logic and Evolutionary Algorithm techniques	Graduated 2005
Alex Berry <sup>1</sup>	DoD TACOM,GTA	Evolving Intelligent Agents for Adaptive First Responder Virtual Training	Graduated 2004
Alex Bertels	SNL CSMP	Hyper-heuristics for Program Understanding induced SAT	Graduated 2016
Jonathan Blount	SNL	Computational Intelligence Techniques for Malware Detection	Graduated 2011
John Chaloupek	SNL/DoE	Power Informatics: Evolutionary Optimization of FACTS device placements	Switched non-thesis
Ajith Cherukad Jose	ORNL	Evolutionary Optimization of Affective Computing	Graduated 2011
Rebecca Curtis	SNL	Automated Algorithm Targeting for Diverse Computational Architectures	Transferred to another school
Benjamin Daniels	LANL	Coevolving attackers and defenders for enterprise computer networks	On leave
Brian Goldman	GTA	Evolutionary Computing	Graduated 2012
Christopher Gore		A Time Series Classifier	Graduated 2008
Jason Cook	GTA	Autonomous Evolutionary Algorithms	Graduated 2010
Adam Harter	GTA	Asynchronous Parallel Evolutionary Algorithms, Hyper-heuristics	Active
Ekaterina Holdener née Smorodkina <sup>1</sup>	GTA	Numerical and Parametrical Analysis of Higher Order Material Models	Graduated 2005
Jasenko Husic	SNL CSMP	Reverse Engineering for Situational Awareness in Computing Networks	Graduated 2014
Matthew Martin	SNL CSMP	Reverse Engineering for Situational Awareness in Computing Networks	Graduated 2015
André Nwamba	GTA	Automated Offspring Sizing in Evolutionary Algorithms	Graduated 2009
Kasthurirangan Parthasarathy	UMRB <sup>2</sup>	Bio-inspired Approaches for Critical Infrastructure Protection: Application of Clonal Selection Principle for Intrusion Detection and FACTS Placement	Graduated 2005
Rohit Parti	UMRB <sup>2</sup>	An Evolutionary Computation approach to Intrusion Response	Graduated 2004
Samuel Richter	GTA	Evolving Selection for Evolutionary Computation	Graduating 2019
George Rush	LANL	Computational Intelligence Approaches for Cyber Security	Graduated 2015
Travis Service	SNL/DoE,GTA	Co-Optimization: A Generalization of Coevolution	Graduated 2008
Jeffery Shelburg	SNL CSMP	Clustering Enhanced Learning Classifier Systems	Graduated 2013
Joshua Tuggle		Evolving SAT solvers	Switched non-thesis
Christopher Walker <sup>1</sup>		A Two-Phase Algorithm for the Registration of Fractured Surfaces	Graduated 2005
Joshua Wilkerson	ISC <sup>3</sup> ,GTA	Co-Evolutionary Automated Software Correction: A Proof of Concept	Graduated 2008

<sup>1</sup> Co-supervised

<sup>2</sup> University of Missouri Research Board

<sup>3</sup> Intelligent Systems Center

## Undergraduate Research Students Supervised

Name	Support	Description	Year
Elizabeth Babb <sup>1</sup>	MRO-W <sup>2</sup>	Indoor Air Quality Simulator	2007
Alex Bertels	OURE <sup>3</sup>	Automated Fitness Guided Fault Localization	2011-2012
Alex Bertels	OURE <sup>3</sup>	Scalable Coevolutionary Automated Software Correction	2012-2013
Alex Bertels	OURE <sup>3</sup>	User-Friendly Coevolutionary Automated Software Correction	2013-2014
James Bridges	OURE <sup>3</sup>	Coevolutionary Automated Software Correction	2011-2012
Andrew Brown	OURE <sup>3</sup>	Creating Graphical User Interfaces for the Virtual Facilitator	2011-2012
Bret Brown	OURE <sup>3</sup>	Local search optimization of FACTS device placement for improving the national power grid	2004-2005
Matthew Bruns		Artificial Intelligence Game Framework	2005
Timothy Coalson		Artificial Intelligence Game Assessment	2008
Jeremy Daugherty	OURE <sup>3</sup>	Cyberinfrastructure for the Automated Partial Credit Grading System	2012-2013
Joshua Eads	OURE <sup>3</sup>	Multi-Agent modeling of cooperative distributed flow-control devices for transport network applications	2006-2007
Joshua Eads <sup>1</sup>	OURE Fellow <sup>5</sup>	Deriving Gas-Phase Exposure History through Computationally Evolved Inverse Diffusion Analysis	2007-2008
Joshua Eads	OURE <sup>3</sup>	Artificial Intelligence Game Framework	2008
Matthew Entrekin	OURE <sup>3</sup>	Evolutionary Computation Library	2008-2009
Jacob Gardner	OURE <sup>3</sup>	Investigation of published evolutionary algorithm performance claims	2011-2012
Adam Gausmann	CSSI <sup>6</sup>	Virtual Network Emulation Infrastructure	2017-
Steven Giangreco	OURE <sup>3</sup> , CREU <sup>4</sup>	Scalable Automated Tailoring of SAT Solvers	2018-
Jasmine Glaese née Bowles	CREU <sup>4</sup> , OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century	2007-2008
Jasmine Glaese née Bowles	CREU <sup>4</sup> , OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century: Phase III	2008-2009
Brian Goldman	OURE <sup>3</sup>	Evolutionary Computation Library	2008-2009
Janet Guntly <sup>1</sup>	MRO-W <sup>2</sup>	Indoor Air Quality Simulator	2008
Janet Guntly	CREU <sup>4</sup> , OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century: Phase III	2008-2009
Lisa Guntly	CREU <sup>4</sup> , OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century	2007-2008
Patrick Hammond		Artificial Intelligence Game Framework	2005
Sean Harris	OURE <sup>3</sup>	A Comparison of Genetic Programming Variants for Hyper-Heuristics	2014-2015
Joshua Herman		eSHANCS: Evolving Simulated Human Activity on Networked Computer Systems	2015-2016
Jesse Hughes	OURE <sup>3</sup>	Hyper-heuristics for Targeting Computational Architectures	2015-2016
Marketa Illetskova	OURE <sup>3</sup>	The Automated Design of SAT Solvers Employing Asynchronous Parallel Hyper-Heuristics	2016-2017
Nathaniel Kamrath	OURE <sup>3</sup>	Evolutionary Computation for the Automated Design of Algorithms	2013-2014
Lauren Kroenung	OURE <sup>3</sup>	Automated Software Correction: Visualization & Parsing	2014-2015
Joseph Kurtz	OURE <sup>3</sup>	Balancing Limited Resources For Speech Transcription on Mobile Devices	2011-2012
Ashley Lang <sup>1</sup>	MRO-W <sup>2</sup>	Indoor Air Quality Simulator	2007

Kristen Loesch	CREU <sup>4</sup> ,OURE <sup>3</sup>	Improving Computer Science recruitment with emphasis on female recruitment	2006-2007
Amber Loftis <sup>1</sup>	MRO-W <sup>2</sup>	Indoor Air Quality Simulator	2007-2008
Kevin Markussen		Artificial Intelligence Game Framework	2005
Charissa Mathis	CREU <sup>4</sup> ,OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century: Phase III	2008-2009
George Mausshardt	OURE <sup>3</sup>	Adaptable User-Friendly Math-Interface for Automated Partial Credit Grading	2012-2013
Clay McGinnis	CSSI <sup>6</sup>	Network Emulation & Intelligent Agent Visualization	2018-
Eric Mertens	OURE <sup>3</sup>	Grid Computing: Deployment of BOINC on the UMR Campus	2005-2006
Eric Michalak	CSSI <sup>6</sup>	Virtual Network Emulation Infrastructure	2016-2017
Justin Miller	OURE <sup>3</sup>	Computer Network Status and Vulnerability Assessment & Visualization Tool Development	2004-2005
Rachel Million	OURE <sup>3</sup> ,CREU <sup>4</sup>	Scalable Automated Tailoring of SAT Solvers	2018
Benjamin Murrell	OURE <sup>3</sup>	Artificial Intelligence Game Framework	2008
Mark Myers	OURE <sup>3</sup>	Melding Computational Game Theory and Formal Models in Cyber Security	2016-2017
Matthew Nuckolls		Virtual Facilitation of Human Group Interaction employing a Crowd Sourcing based Learning Classifier System	2010
Timothy Olson	OURE <sup>3</sup>	Artificial Intelligence Game Framework	2008
Vincent Pizzo	OURE <sup>3</sup>	Creating A Universal Virtual Facilitation Bot Client Interface	2011-2012
Thomas Reese	OURE <sup>3</sup>	Investigation and development of black box search benchmarks	2011-2012
Hannah Reinbolt	CSSI <sup>6</sup>	Cybersecurity Agent API	2017-
William Reynolds	OURE <sup>3</sup>	Domain Specific Language Creation for Virtual Facilitation Role Play	2011-2012
Samuel Richter	OURE <sup>3</sup>	Cyber Security Research Infrastructure for Coevolving Adversaries	2015-2016
Christopher Roush	OURE <sup>3</sup>	Evolutionary Computation Library	2008-2009
George Rush	OURE <sup>3</sup>	Evolutionary Algorithm Software Factory: Phase II	2009-2010
Chelsea Sanders	OURE <sup>3</sup>	Creating An Automated Partial Credit Grading Engine	2011-2012
Kevin Schoonover	CSSI <sup>6</sup> ,OURE <sup>3</sup>	Virtual Network Emulation Infrastructure	2017-
Travis Service		Artificial Intelligence Game Framework	2005
Brian Shaver		Artificial Intelligence Game Framework	2005
Jeffrey Shelburg	OURE <sup>3</sup>	Cyberinfrastructure for Virtual Facilitation of Human Group Interaction	2010-2011
Jared Simon	OURE <sup>3</sup>	Cyberinfrastructure for Coevolutionary Automated Software Correction	2010-2011
Luke Simon	OURE <sup>3</sup>	Visualization for Cyber Security Practitioners	2014-2015
Alex Smith	OURE <sup>3</sup>	Creating A Scalable Automated Partial Credit Grading Engine	2012-2013
Margret Steele	OURE <sup>3</sup>	Developing Platform-Independent Server for Virtual Facilitator	2011-2012
Charles Tullock	OURE <sup>3</sup>	AI Robotic Soccer Development Platform	2006-2007
Kathleen Venhaus	OURE <sup>3</sup>	Cyberinfrastructure for the Automated Partial Credit Grading System	2011-2012
Michael Virag	OURE <sup>3</sup>	Modifying Symbolic Solvers for Automated Partial Credit Grading	2010-2011

Tiffany Werckmann	OURE <sup>3</sup>	User-Friendly Math-Interface for Automated Partial Credit Grading	2011-2012
Jessica Williams	CREU <sup>4</sup> ,OURE <sup>3</sup>	Computer Science Recruitment for the 21st Century	2007-2008
Michael Wisely	OURE <sup>3</sup>	User-Friendly Math-Interface for Automated Partial Credit Grading	2010-2011
Laura Woodard	CREU <sup>4</sup> ,OURE <sup>3</sup>	Improving Computer Science recruitment with emphasis on female recruitment	2006-2007
Evan Wright	OURE <sup>3</sup>	Power Informatics: graph theoretic algorithms for modeling flow control	2006-2007
Matthew Zieger	OURE <sup>3</sup>	Reverse Engineering for Cyber Security	2013-2014

<sup>1</sup> *Co-supervised*

<sup>2</sup> *Multidisciplinary Research Opportunities for Women*

<sup>3</sup> *Opportunities for Undergraduate Research Experience*

<sup>4</sup> *Collaborative Research Experience for Undergraduates*

<sup>5</sup> *Opportunities for Undergraduate Research Experience Fellow Program*

<sup>6</sup> *Los Alamos National Laboratory/Missouri S&T Cyber Security Sciences Institute*

## Academic Service

### Missouri S&T - Department of Computer Science Service (sorted by start date)

**9/2018-** Chair, Open-Rank Tenure-Track/Tenured Faculty Search Committee

**9/2018-** Chair, Ad Hoc Non-Tenure-Track Teaching Faculty Promotion Committee

**10/2017-** Faculty Advisor, ACM Student Chapter SIG-Game

**10/2017-12/2017** Member, OSA-III Staff Search Committee

**5/2017-12/2017** Chair, Assistant Teaching Professor Search Committee

**10/2016-5/2017** Vice-Chair, Department Chair Search Committee

**8/2016-9/2016** Chair, OSA-IV Staff Search Committee

**12/2015-12/2016** Member, Assistant Teaching Professor Search Committee

**9/2015-7/2016** Member, Peer Teaching Evaluation Committee

**11/2013-10/2014** Chair, Assistant Teaching Professor Search Committee

**11/2012-8/2013** Member, Department Chair Search Committee

**8/2011-7/2014** OURE / Undergraduate Research Coordinator

**6/2011-7/2014, 7/2016-** Chair, Undergraduate Committee

**9/2009-5/2011** Member, (ABET) Accreditation Committee

**2008-2013** Chair, Publicity Committee

**2008-2009** Member, Diversity Committee

**2007-2009** Member, Graduate Practices and Policies Committee

**2007** Member, Space Allocation Committee

**2006-2007** Member, Chair Search Committee

**2004-2013** Library Liaison

**2004** Member, Ad Hoc Undergraduate Omnibus Curriculum Committee

**2003-2008** Member, Curriculum Committee

**2003-** Faculty Advisor, ACM Student Chapter SIG-Security

**Missouri S&T - Campus Level Service (sorted by start date)**

**8/2018-** Member, Missouri S&T Tenure (Policy) Committee

**1/2018-5/2018** Member, Ad-Hoc Committee to Review Freshman Curriculum Experience

**7/2016-6/2018** Alternate Member, Missouri S&T Grievance Resolution Panel Committee

**11/2015-** Member, Discipline Specific Curricula Committee - Engineering

**10/2015-9/2016** Member, Faculty Service Awards Committee

**9/2015-** Chair, Missouri S&T Computer Security Task Force

**12/2014-** Member, Cynthia Tang Missouri Distinguished Professor in Computer Engineering Search Committee

**8/2013-7/2014** Senator, Faculty Senate

**5/2013-** Chair, Faculty Senate Rules, Procedures, and Agenda Committee's Ad Hoc Add Drop Procedure Committee

**3/2013-** Member, Provost's Course Renumbering Committee

**11/2010-7/2014** Chair, Campus Curricula Committee

**10/2009-7/2014** Chair, Discipline Specific Curricula Committee - Sciences

**10/2009-10/2010** Member, Campus Curricula Committee

**11/2008-** Member, Missouri S&T Research Computing Task Force

**10/2008-6/2010** Chair, Faculty Senate Standing Committee on Library and Learning Resources

**9/2008-9/2009, 8/2014-11/2015** Member, Discipline Specific Curricula Committee - Sciences

**2006-2007** Rotating Coordinator, Promotion & Tenure Writers Group

**2004-2006** Member, Academic Council Ad Hoc Committee on Conflict of Interest

**2003-9/2015** Member, Missouri S&T Computer Security Task Force

**2003-2005** Member, College of Arts & Sciences Curriculum Committee

**Leiden University**

**1993-1996** Student Member, Computer Science & Math Advisory Committee

**1993-1996** Student Member, Computer Science Department Faculty Council

**1991-1996** Student Member, Computer Science Department Teaching Committee

**1991-1994** Student Member, Math Department Teaching Committee

**Academic Community Service**

**2015-** Associate Editor, Evolutionary Computing area, Springer's Natural Computing journal

**2007-** Serve periodically as NSF/CISE grant proposal panelist

**2003-** Serve periodically as University of Missouri Research Board grant proposal reviewer

**1993-1995** Student Member, Dutch National Computer Science Advisory Board

**Conferences**

**2019** Co-Chair, 8th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) @ GECCO 2019 - the 21st ACM Annual Conference on Genetic and Evolutionary Computation

**2019** Co-Instructor, Hyper-heuristics Tutorial @ GECCO 2019 - the 21st ACM Annual Conference on Genetic and Evolutionary Computation

**2019** Program Committee, Genetic Algorithms Track, GECCO 2019 - the 21st ACM Annual Conference on Genetic and Evolutionary Computation

**2018** Co-Chair, 8th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) @ GECCO 2018 - the 20th ACM Annual Conference on Genetic and Evolutionary Computation

**2018** Co-Instructor, Hyper-heuristics Tutorial @ GECCO 2018 - the 20th ACM Annual Conference on Genetic and Evolutionary Computation

**2018** Program Committee, Genetic Algorithms Track, GECCO 2018 - the 20th ACM Annual Conference on Genetic and Evolutionary Computation

**2018** Program Committee, PPSN 2018 - the 15th International Conference on Parallel Problem Solving from Nature

**2017** Co-Chair, 7th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) @ GECCO 2017 - the 19th ACM Annual Conference on Genetic and Evolutionary Computation

**2017** Co-Instructor, Hyper-heuristics Tutorial @ GECCO 2017 - the 19th ACM Annual Conference on Genetic and Evolutionary Computation

**2017** Program Committee, Genetic Algorithms Track, GECCO 2017 - the 19th ACM Annual Conference on Genetic and Evolutionary Computation

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- 2016** Co-Chair, 6th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) @ GECCO 2016 - the 18th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2016** Co-Instructor, Hyper-heuristics Tutorial @ GECCO 2016 - the 18th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2016** Co-Organizer, Combinatorial Black Box Optimization Competition (CBBOC) @ GECCO 2016 - the 18th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2016** Program Committee, Genetic Algorithms Track, GECCO 2016 - the 18th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2016** Program Committee, PPSN 2016 - the 14th International Conference on Parallel Problem Solving from Nature
  - 2016** Program Committee, COMPSAC 2016 - the 40th Annual IEEE International Computers, Software & Applications Conference
  - 2015** Co-Chair, 5th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) @ GECCO 2015 - the 17th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2015** Co-Chair, 2nd Workshop on Metaheuristic Design Patterns (MetaDeeP) @ GECCO 2015 - the 17th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2015** Co-Instructor, Hyper-heuristics Tutorial @ GECCO 2015 - the 17th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2015** Co-Organizer, Combinatorial Black Box Optimization Competition (CBBOC) @ GECCO 2015 - the 17th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2015** Program Committee, Genetic Algorithms Track, GECCO 2015 - the 17th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2015** Program Committee, NasBASE 2015 - the First North American Search Based Software Engineering Symposium
  - 2015** Program Committee, COMPSAC 2015 - the 39th Annual IEEE International Computers, Software & Applications Conference
  - 2014** Program Committee, PPSN 2014 - the 13th International Conference on Parallel Problem Solving from Nature
  - 2014** Program Committee, Genetic Algorithms Track, GECCO 2014 - the 16th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2014** Program Committee, COMPSAC 2014 - the 38th Annual IEEE International Computers, Software & Applications Conference
  - 2013** Co-Chair, Genetic Algorithms Track - GECCO 2013 - the 15th ACM Annual Conference on Genetic and Evolutionary Computation
  - 2012** Co-Chair, Genetic Algorithms Track - GECCO 2012 - the 14th ACM Annual Conference on Genetic and Evolutionary Computation



- 2011** Chair, Doctoral Symposium, COMPSAC 2011 - the 35th Annual IEEE International Computers, Software & Applications Conference
- 2011** Reviewer, IEEE CEC 2011 - Congress on Evolutionary Computation
- 2010** Late Breaking Papers Chair, ACM GECCO 2010 - Genetic and Evolutionary Computation Conference
- 2010** Program Committee, Genetic Algorithms Track, ACM GECCO 2010 - Genetic and Evolutionary Computation Conference
- 2010** Reviewer, IEEE CEC 2010 - Congress on Evolutionary Computation
- 2009** Program Committee, Genetic Algorithms Track, ACM GECCO 2009 - Genetic and Evolutionary Computation Conference
- 2009** Program Committee, IEEE CEC 2009 - Congress on Evolutionary Computation
- 2008** Program Committee, Genetic Algorithm Track, ACM GECCO 2008 - Genetic and Evolutionary Computation Conference
- 2008** Program Committee, SIS 2008 - IEEE Swarm Intelligence Symposium
- 2008** Program Committee, IEEE COMPSAC 2008 - The 32nd Annual International Computer Software and Applications Conference
- 2007** Program Committee, ISA 2007 - IADIS Intelligent Systems and Agents 2007
- 2005** Program Committee, FEA 2005 - 6th International Workshop on Frontiers in Evolutionary Algorithms (JCIS 2005 conference track)
- 2004** Program Committee, IEEE IRE-2004 - 2004 IEEE International Conference on Information Reuse and Integration

### Journal Referee

*ACM Computing Surveys, Artificial Intelligence, Genetic Programming and Evolvable Machines, IEEE Transactions on Evolutionary Computing, Natural Computing, IEEE Software, IEEE Transactions on Control Systems Technology, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Neural Networks, IEEE Transactions on Systems, Man, and Cybernetics–Part C: Applications and Reviews, International Journal of Smart Engineering System Design, Journal of Global Optimization, Computing, Journal of Systems and Software*

### Textbook Reviews

*McGraw-Hill Higher Education, Oxford University Press*

### Professional Affiliations

- Senior Member, Association for Computing Machinery (ACM)
  - ACM Special Interest Group on Genetic and Evolutionary Computation (SIGEVO)
  - ACM Special Interest Group on Artificial Intelligence (SIGART)
  - ACM Special Interest Group on Computer Science Education (SIGCSE)
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
  - IEEE Computer Society
  - IEEE Computational Intelligence Society