

CONTACT INFORMATION	Arizona State University School of Computing, Informatics, and Decision Systems Engineering PO Box 878809, Room 553 Tempe, AZ 85287-8809 USA	Work: +1-480-965-2899 Fax: +1-480-965-2751 E-mail: tpavlic@asu.edu WWW: www.tedpavlic.com
QUALIFICATIONS AND INTERESTS	Advanced control systems, complex adaptive systems, computational agent-based modeling, hybrid dynamic systems, distributed algorithms, decentralized decision making, emergence and self organization, amorphous computing, autonomous systems and vehicles, networks, communications, verification, cooperation, optimization, game theory, parallel computation, robotics, sustainability in the built environment, energy systems, analog electronics, behavioral ecology, bio-mimicry	
AVAILABILITY	<ul style="list-style-type: none"> <li>• Start time is negotiable; may be possible to start immediately</li> <li>• Geographic location is flexible, but there is preference for Tempe, AZ</li> </ul>	
SECURITY CLEARANCE	Department of Defense Top Secret SCI with polygraph (expired: 2002)	
EDUCATION	<p><b>The Ohio State University</b>, Columbus, OH</p> <p>Ph.D., Electrical and Computer Engineering, August 2010    GPA: 3.70 (4.0 scale)</p> <ul style="list-style-type: none"> <li>• Thesis Topic: Design and Analysis of Optimal Task-Processing Agents</li> <li>• Candidacy: Research Problems in Distributed Control for Energy Systems</li> <li>• Adviser: Professor Kevin M. Passino</li> <li>• Area of Study: Control Engineering</li> </ul> <p>M.S., Electrical and Computer Engineering, August 2007    GPA: 3.70 (4.0 scale)</p> <ul style="list-style-type: none"> <li>• Thesis Topic: Optimal Foraging Theory Revisited</li> <li>• Adviser: Professor Kevin M. Passino</li> <li>• Area of Study: Control Engineering</li> </ul> <p>B.S., Electrical and Computer Engineering, June 2004    GPA: 3.86 (4.0 scale)</p> <ul style="list-style-type: none"> <li>• Magna cum Laude, With Honors in Engineering</li> <li>• Electrical specialization (emphasis on electromagnetics and digital computers)</li> <li>• Minor in Computer and Information Systems (programming and algorithms)</li> </ul>	
PROFESSIONAL EXPERIENCE	<p><b>Arizona State University</b>, Tempe, AZ</p> <p><u>Assistant Professor</u> <span style="float: right;"><b>August 2015 to present</b></span></p> <ul style="list-style-type: none"> <li>• Joint Appointment: <ul style="list-style-type: none"> <li>• School of Computing, Informatics, and Decision Systems Engineering</li> <li>• School of Sustainability</li> </ul> </li> <li>• Graduate faculty in Industrial Engineering/Operations Research, Computer Engineering, Sustainability, Applied Math for the Life and Social Sciences, Biology, and Animal Behavior.</li> <li>• Interdisciplinary laboratory focus on decision making and organization.</li> </ul> <p><u>Associate Research Scientist</u> <span style="float: right;"><b>August 2014 to July 2015</b></span></p> <p><u>Postdoctoral Scholar</u> <span style="float: right;"><b>July 2012 to August 2014</b></span></p> <ul style="list-style-type: none"> <li>• Supervisor: Professor Stephen C. Pratt</li> <li>• Novel application of sophisticated quantitative analysis and modeling techniques to animals, with social insects as a particular focus.</li> </ul>	

- Development of new algorithms for robotics and other autonomous systems based on animal behavior, with focus on distributed decision making.
- Supervision of graduate and undergraduate students in engineering, computer science, and biology in tasks related to biological analysis and modeling as well as technological bio-mimetic design.

**The Ohio State University**, Columbus, OH

Postdoctoral Researcher

**September 2010 to June 2012**

- Funding: National Science Foundation Cyber-Physical Systems (ENG, ECCS)
  - “Autonomous Driving in Mixed-Traffic Urban Environments” (grant #0931669)
  - Supervisor (co-PI): Professor Paolo A. G. Sivilotti
  - PI: Professor Ümit Özgüner
- Development of new approaches to software verification in the context of hybrid-state and hybrid-time dynamical systems.
- Supervision of student design project for novel vehicle-to-vehicle communications systems to assist in adaptive cruise control.

**National Instruments**, Austin, TX

Hardware R&D Intern for Multifunction DAQ

**June 2003 to September 2003**

- Designed final verification test fixture for use with STC2 MIO products.
- Designed and executed study of the effect of varying burn-in time on long-term drift of common industry voltage references.

Hardware R&D Intern for Multifunction DAQ

**June 2002 to September 2002**

- Designed and performed validation tests for 16-bit 800 kHz NI-6120 SMIO DAQ.
- Designed high-quality source to use with NI-5411 arbitrary function generator.

**IBM Network Storage**, Research Triangle Park, NC

Core Systems Software Developer for FlexNAS

**June 2001 to September 2001**

- Designed and implemented highly available multihop communications subsystem.
- Participated in software development of various vital box services.

**CallTech Communications**, Columbus, OH

Information Technology Systems Engineer

**June 1997 to May 2001**

- Responsible for the acquisition, setup, and administration of all hardware and software systems supporting NetWalk Internet service and web presence provider.
- Designed and implemented state-of-the-art open-source highly available load-balancing system supporting thousands of virtual servers.
- Developed call-center software for clients such as CompuServe, AOL, and Price-line.

**MegaLinx Communications**, Dublin, OH

Web Developer and Support Representative

**June 1995 to May 1997**

- Produced web content for commercial clients.
- Assisted in administration of UltraSPARC, x86, 680x0, and PowerPC systems.
- Developed multi-platform open-source file-sharing solution.
- Provided technical support for Internet and web presence customers.

REFEREED  
JOURNAL  
PUBLICATIONS

- [1] Baudier, K., M. Ostwald, C. Grueter, F. Segers, D. Roubik, T.P. Pavlic, S.C. Pratt, and J.H. Fewell. Changing of the guard: flexible specialization and age polyethism in nest defense of the stingless bee *Tetragonisca angustula*. *Behavioral Ecology*. 2019. In press.
- [2] Burchill, A., and T.P. Pavlic. Dude, Where's my Mark? Creating Robust Animal Identification Schemes Informed by Communication Theory. *Animal Behaviour*. 2019. Accepted.
- [3] Wilson, R.S., T.P. Pavlic, R. Wheatley, A. Niehaus, O. Levy. Modelling escape success in terrestrial predator–prey interactions. *Functional Ecology*. 2018. In revision.
- [4] Hunter, A., M.J. Angilletta Jr., T.P. Pavlic, G. Lichtwark, and R.S. Wilson. Modeling the two-dimensional accuracy of soccer kicks. *Journal of Biomechanics*, 72:159–166, April 27, 2018. doi:10.1016/j.jbiomech.2018.03.003
- [5] Wilson, S., T.P. Pavlic, G.P. Kumar, A. Buffin, S. Pratt, and S. Berman. Design of ant-inspired stochastic control policies for collective transport by robotic swarms. *Swarm Intelligence*, 8(4):303–327, December 2014. doi:10.1007/s11721-014-0100-8
- [6] Pavlic, T.P., S. Wilson, G.P. Kumar, and S. Berman. Control of stochastic boundary coverage by multi-robot systems. *Journal of Dynamic Systems, Measurement, and Control* [Special Issue on Stochastic Models, Control and Algorithms in Robotics], 137(3):034505, October 21, 2014. doi:10.1115/1.4028353
- [7] Pavlic, T.P., and K.M. Passino. Distributed and Cooperative Task Processing: Cournot Oligopolies on a Graph. *IEEE Transactions on Cybernetics*. 44(6):774–784, June 2014. doi:10.1109/TCYB.2013.2271776
- [8] Pavlic, T.P., and K.M. Passino. Generalizing foraging theory for analysis and design. *The International Journal of Robotics Research* [Special Issue on Stochasticity in Robotics and Bio-Systems Part 1], 30(5):505–523, 2011. doi:10.1177/0278364910396551
- [9] Pavlic, T.P., and K.M. Passino. The sunk-cost effect as an optimal rate-maximizing behavior. *Acta Biotheoretica*, 59(1):53–66. 2011. doi:10.1007/s10441-010-9107-8
- [10] Pavlic, T.P., and K.M. Passino. When rate maximization is impulsive. *Behavioral Ecology and Sociobiology*, 64(8):1255–1265. August 2010. doi:10.1007/s00265-010-0940-1
- [11] Pavlic, T.P., and K.M. Passino. Foraging theory for autonomous vehicle speed choice. *Engineering Applications of Artificial Intelligence*, 22(3):482–489, April 2009. doi:10.1016/j.engappai.2008.10.017

CONFERENCE  
PUBLICATIONS

- [12] Bowers, K.P., L.G. Strickland, G. Cooke, C. Pippin, and T.P. Pavlic. Trust-based Information Propagation on Multi-robot Teams in Noisy Low-communication Environments. In: *Proceedings of the 14th International Symposium on Distributed Autonomous Robotic Systems*, October 15–17, 2018. Boulder, CO, USA.
- [13] Strickland, L.G., K. Baudier, K.P. Bowers, T.P. Pavlic, and C. Pippin. Bio-Inspired Role Allocation of Heterogeneous Teams in a Site Defense Task. In: *Proceedings of the 14th International Symposium on Distributed Autonomous Robotic Systems*, October 15–17, 2018. Boulder, CO, USA.

- [14] Valentini, G., D.G. Moore, J.R. Hanson, T.P. Pavlic, S.C. Pratt, and S.I. Walker. Transfer of Information in Collective Decisions by Artificial Agents. In: Proceedings of the 2018 Conference on Artificial Life, July 23–27, 2018. Tokyo, Japan.
- [15] Choi, T., T.P. Pavlic, and A. Richa. Automated Synthesis of Scalable Algorithms for Inferring Non-Local Properties to Assist in Multi-Robot Teaming. In: Proceedings of the 2017 IEEE International Conference on Automation Science and Engineering (CASE 2017), August 20–23, 2017.
- [16] Tuncali, C.E., S. Yaghoubi, T.P. Pavlic, and G. Fainekos. Functional Gradient Descent Optimization for Automatic Test Case Generation for Vehicle Controllers. In: Proceedings of the 2017 IEEE International Conference on Automation Science and Engineering (CASE 2017), August 20–23, 2017.
- [17] Tuncali, C.E., T.P. Pavlic, and G. Fainekos. Utilizing S-TaLiRo as an Automatic Test Generation Framework for Autonomous Vehicles. In: Proceedings of the 19th International Conference on Intelligent Transportation Systems (ITSC 2016), November 1–4, 2016.  
doi:10.1109/ITSC.2016.7795751
- [18] Campbell, J., C.E. Tuncali, P. Liu, T.P. Pavlic, U. Ozguner, and G. Fainekos. Modeling concurrency and reconfiguration in vehicular systems: A  $\pi$ -calculus approach. In: Proceedings of the 2016 IEEE International Conference on Automation Science and Engineering (CASE 2016), August 21–24, 2016.  
doi:10.1109/COASE.2016.7743450
- [19] Pavlic, T.P., A. Adams, P.C.W. Davies, and S.I. Walker. Self-referencing cellular automata: A model of the evolution of information control in biological systems. In: Proceedings of the 14th International Conference on the Synthesis and Simulation of Living Systems (ALIFE 14), July 30 – August 2, 2014.  
doi:10.7551/978-0-262-32621-6-ch083
- [20] Pavlic, T.P.. Using Physical Stigmergy in Decentralized Optimization Under Multiple Non-separable Constraints: Formal Methods and an Intelligent Lighting Example. In: Proceedings of the 2014 Workshop on Nature Inspired Distributed Computing (NIDISC 2014), pp. 402–411, May 19, 2014.  
doi:10.1109/IPDPSW.2014.52
- [21] Pavlic, T.P., S. Wilson, G.P. Kumar, and S. Berman. An enzyme-inspired approach to stochastic allocation of robotic swarms around boundaries. In: Proceedings of the 16th International Symposium on Robotics Research (ISRR 2013), pp. 631–647, December 16–19, 2013. doi:10.1007/978-3-319-28872-7\_36
- [22] Kumar, G.P., A. Buffin, T.P. Pavlic, S.C. Pratt, and S.M. Berman. A Stochastic Hybrid System Model of Collective Transport in the Desert Ant *Aphaenogaster cockerelli*. In: Proceedings of the 16th International Conference on Hybrid Systems: Communication and Control (HSCC 2013), pp. 119–124, April 8–11, 2013. doi:10.1145/2461328.2461349
- [23] Pavlic, T.P., and K.M. Passino. Cooperative task-processing networks. In: Proceedings of the Second International Workshop on Networks of Cooperating Objects (CONET 2011), April 11, 2011.
- [24] Freuler, R.J., M.J. Hoffmann, T.P. Pavlic, J.M. Beams, J.P. Radigan, P.K. Dutta, J.T. Demel, and E.D. Justen. Experiences with a Comprehensive Freshman Hands-On Course – Designing, Building, and Testing Small Autonomous Robots. In: Proceedings of the 2003 American Society for Engineering Education Annual Conference & Exposition, 2003.

CONFERENCE  
TALKS

- [25] T.P. Pavlic. Distributed Non-linear Optimization under Non-separable Constraints: A Low-communication Approach with a Power Systems Example. In: 2018 INFORMS Annual Meeting, November 4–7, 2018. Phoenix, AZ, USA.
- [26] Xin Su, and T.P. Pavlic. Improving Exploration in Population-based Metaheuristics using Fading Consensus: Application to PSO. In: 2018 INFORMS Annual Meeting, November 4–7, 2018. Phoenix, AZ, USA.
- [27] Pavlic, T.P., J.R. Hanson, G. Valentini, S.I. Walker, and S.C. Pratt. Quorum sensing without counting, a discounting approach, or: Nobody goes there anymore, it's too crowded. In: 6th Workshop on Biological Distributed Algorithms (BDA 2018), July 23, 2018. London, UK.
- [28] Burchill, A., T.P. Pavlic, and S.C. Pratt. Macronutrient regulation and foraging strategies in the Neotropical ant *Ectatomma ruidum*. In: 2017 Annual Meeting of the Entomological Society of America, November 5–8, 2017. Denver, CO, USA.
- [29] Xin Su, and T.P. Pavlic. Characterization and Prediction of Hyper-jump Diffusion in Consensus Dynamics on Networks. In: 2017 INFORMS Annual Meeting, October 22–25, 2017. Houston, TX, USA.
- [30] Wheatley, R., O. Levy, T.P. Pavlic, and R.S. Wilson. What factors determine predation success? Considering speed, agility, and strategy for predators and prey. In: 2017 Annual Meeting of the Society for Integrative and Comparative Biology, January 4–8, 2017. New Orleans, LA, USA.
- [31] Wheatley, R., O. Levy, T.P. Pavlic, and R.S. Wilson. Predicting predator evasion success based on speed, agility, and escape path. In: 2016 Ecological Society of Australia, November 28 – December 2, 2016. Fremantle, Australia.
- [32] Pavlic, T.P.. From social insects to smart, flexible, adaptive teams of robots: The biomechanics of group decision-making. In: 2016 XXV International Congress of Entomology, September 25–30, 2016. Orlando, FL, USA.
- [33] Pavlic, T.P., and S.C. Pratt. Testing Unified Foraging Theories with Social Insects: Integrating Macronutrient Regulation with More Traditional Costs and Benefits. In: 2015 Conference on Complex Systems, September 28 – October 2, 2015. Tempe, AZ, USA.
- [34] Pavlic, T.P., and S.C. Pratt. Numerical Methods within the Ant Colony: The Illuminating Case of Multi-Objective Macronutrient Regulation in Eusocial Insects. In: 2nd Workshop on Biological Distributed Algorithms (BDA 2014), Austin, TX, October 11–12, 2014.
- [35] Pavlic, T.P., and S.C. Pratt. Understanding foraging patterns that achieve colony-level macronutrient regulation. In: 2014 International Union for the Study of Social Insects International Congress (IUSSI 2014), Queensland, Australia, July 13–18, 2014.
- [36] Pavlic, T.P. Kinetic modeling of social insect behavior and beyond: Lessons from stochastic robotics. In: 2013 International Symposium on Biomathematics and Ecology Education and Research (BEER 2013), Arlington, VA, October 11–13, 2013.
- [37] Pavlic, T.P., and S.C. Pratt. Sequential-sampling models of quorum sensing in house-hunting *Temnothorax* ants. In: 50th Annual Conference of the Animal Behavior Society, July 28–August 1, 2013.

[38] Pavlic, T.P. Speed–accuracy tradeoffs in *Temnothorax rugatulus* ants: Sequential-sampling models of quorum detection while house hunting. In: 2013 Society for Mathematical Biology Annual Meeting and Conference (SMB 2013), June 10–13, 2013.

[39] Pavlic, T.P., and S.C. Pratt. Sequential-sampling models of quorum detection in house-hunting ants. In: 2012 North American Section Meeting of the International Union for the Study of Social Insects (IUSSI-NAS 2012), October 5–7, 2012.

CONFERENCE  
POSTERS

[40] Xin Su, and T.P. Pavlic. Dynamical Characterizations of Complex Behavior in Consensus Networks with Stochastic Link Failures. In: Proceedings of the 2017 SIAM Conference on Dynamical Systems, May 21–25, 2017. Snowbird, UT, USA. Poster abstract.

[41] Burchill, A.T., T.P. Pavlic, and S.C. Pratt. Consistent self-organized foraging allocations in the macronutrient-regulating carpenter ant, *Camponotus fragilis*. In: 2016 XXV International Congress of Entomology, September 25–30, 2016. Orlando, FL, USA. Poster abstract. doi:10.1603/ICE.2016.114782

[42] Pavlic, T.P. Physical Stigmergy for Decentralized Constrained Optimization: An Intelligent Lighting Example. In: Proceedings of the 4th International Conference on Cyber-Physical Systems (ICCPs 2013), April 8–11, 2013. Poster abstract.

[43] Pavlic, T.P., S. P. Peddi, P.A.G. Sivilotti, and B.W. Weide. Getting Out of the Way – Safety Verification without Compromise. In: Proceedings of the 2012 IEEE/ACM Third International Conference on Cyber-Physical Systems (ICCPs 2012), April 17–19, 2012. Poster abstract.

[44] Pavlic, T.P., P.A.G. Sivilotti, A.D. Weide, and B.W. Weide. Verification of Smooth and Close Collision-Free Cruise Control. In: Proceedings of the 2011 Symposium on Control and Modeling Cyber-Physical Systems, October 20–21, 2011. Poster abstract.

[45] Özgüner, Ü., A. Krishnamurthy, F. Özgüner, K. Redmill, P. Sivilotti, B. Weide, and T. Pavlic. CPS: Autonomous driving in urban environments. In: Proceedings of the 2011 NSF CPS PI Meeting, August 1–2, 2011. Poster abstract.

[46] Pavlic, T.P., and K.M. Passino. Cooperative task processing. In: Proceedings of the ICAM 2009 Symposium: Emergence in Physical, Biological, and Social Systems IV, November 13, 2009. Poster abstract.

INVITED TALKS

[47] Pavlic, T.P. Thinking Outside the 'Bot: What Ecology, Physiology, and Conservation Biology can Offer to Engineering Design. In: Georgia Institute of Technology Decision and Control Laboratory Seminar, July 19, 2017.

[48] Pavlic, T.P. Living laboratories and natural histories for distributed computing. In: Moving and Computing 2017: 7th Research Meeting and School on Distributed Computing by Mobile Robots, June 5–9, 2017.

[49] Pavlic, T.P. Be Undisciplined. Lose Your Innocence. Get to Work. In: TEDxASU 2017: Innovators, March 23, 2017.

[50] Pavlic, T.P. Algorithmic foundations of biological matter: faster, cheaper, and more out of control. In: Algorithmic Foundations of Programmable Matter (Dagstuhl Seminar 16271), July 3–8, 2016.

- [51] Pavlic, T.P. Kinetic modeling of collective behavior: When a good match goes bad. In: KI-Net Workshop on Collective Dynamics and Model Verification: Connecting Kinetic Modeling to Data, April 17–19, 2015.
- [52] Pavlic, T.P. The hidden demographics of distributed information processing: The role of intermediates in a social-insect colony. In: Social Insects as Models for Biological Complexity: Lessons Learned and Challenges on the Horizon, symposium of the 2014 Annual Meeting of the Entomological Society of America (Entomology 2014). November 16–19, 2014.
- [53] Pavlic, T.P. Understanding foraging patterns that achieve colony-level macronutrient regulation. In: ASU–UWü International Symposium and Workshop on Frontiers in Insect Behavior, Social Organization, and Evolution, May 23–30, 2014.
- [54] Pavlic, T.P. Take Home Messages: Evolution of Distributed Computational Networks. In: BEYOND Center Physics of Living Matter Workshop: Information, Complexity, and Life, February 24–25, 2013.
- [55] Pavlic, T.P. Biomathematics at “The New American University.” In: “Biomathematics Courses and Programs” expert panel at 2013 International Symposium on Biomathematics and Ecology Education and Research (BEER 2013), October 11–13, 2013.
- [56] Pavlic, T.P. The Economic Framework: Constrained Optimization and Colony Collapse Disorder. In: Perspectives for Mathematical and Biological Interdisciplinary Research on Honeybees and Pollination, June 14, 2013.
- [57] Pavlic, T.P. Stochastic Robotics: Complexity, Compositionality, and Scalability. In: KI-Net Workshop on Kinetic Theory for the Emergence of Complex Behavior in Social and Economic Systems, February 22–24, 2013.
- BOOK CHAPTERS [58] Pavlic, T.P. Social Models from Non-Human Systems. In: P. Davis, J. Pfautz, and Angela O’Mahony (Eds), Social-Behavioral Modeling for Complex Systems, ch. 11, 2018. In press.
- [59] Weinstein, S., and T.P. Pavlic. Noise and function. In: S.I. Walker, P.C.W. Davies, and G.F.R. Ellis (Eds), From Matter to Life, ch. 9, pp. 126–143, 2017. doi:10.1017/9781316584200.009
- [60] Pavlic, T.P., and S.C. Pratt. Superorganismic Behavior via Human Computation. In: P. Michelucci (Ed.), Handbook of Human Computation, ch. 74, pp. 911–960. 2013. doi:10.1007/978-1-4614-8806-4\_74
- OTHER PUBLICATIONS [61] Pavlic, T.P., P.A.G. Sivilotti, A.D. Weide, and B.W. Weide. Comments on ‘Adaptive Cruise Control: Hybrid, Distributed, and Now Formally Verified’. Tech. report OSU-CISRC-7/11-TR22, The Ohio State University, 2011.
- [62] Pavlic, T.P., and K.M. Passino. Cooperative Task-processing Networks: Parallel Computation of Non-trivial Volunteering Equilibria. Tech. report OSU-CISRC-3/11-TR05, The Ohio State University, 2011.
- [63] Pavlic, T.P. Design and Analysis of Optimal Task-Processing Agents. PhD thesis, The Ohio State University, Columbus, OH, 2010.
- [64] Pavlic, T.P. Optimal Foraging Theory Revisited. Master’s thesis, The Ohio State University, Columbus, OH, 2007.

PAPERS IN  
PREPARATION

- [65] Valentini, G., N. Mizumoto, T.P. Pavlic, S.C. Pratt, and S.I. Walker. Control of information flow with acknowledgment tokens in a non-human organism.
- [66] Xiaohui Guo, M.R. Lin, L.P. Saldyt, T.P. Pavlic, Y. Kang, J.H. Fewell. Adaptive alarm signal propagation by ant colonies: using a machine learning approach to track individual and colony response.
- [67] Pavlic, T.P., and S.C. Pratt. The Economic Framework: Using constrained optimization to unify the ideal free distribution, the marginal value theorem, and the geometric framework of nutrition.
- [68] Pavlic, T.P. Risk-sensitive foraging and the Sharpe ratio.

## GRANTS

**Awarded**

- [1] Co-Principal Investigator, “Energy-efficient Neuromorphic Computing in Light of the Structural and Functional Evolution of Multi-scale Insect Brains”, DARPA DSO, \$1,000,000, April 3, 2019 to October 2, 2020.
- [2] Co-Principal Investigator, “Autonomous System Control via Social Insect Models”, DARPA I2O, \$990,792, May 17, 2018 to August 17, 2018.
- [3] Co-Principal Investigator, “Biomimicry for Sensory Communication”, Google, \$288,367, December 1, 2017 to July 31, 2018.
- [4] Co-Principal Investigator, “CRISP: Type 2/Collaborative Research: Design and Control of Coordinated Green and Gray Water Infrastructure to Improve Resiliency in Chemical and Agricultural Sectors”, NSF SES-1735579, \$1,874,988, September 1, 2017 to August 31, 2021.
- [5] Co-Principal Investigator, “A Methodology for Modeling Swarm Behavioral Dynamics from Local Observations”, DARPA I2O, \$175,000, June 1, 2017 to May 31, 2018.
- [6] Co-Principal Investigator, “BioSwarm: Bio-Inspired Swarming”, DARPA I2O, \$193,079, December 1, 2016 to February 28, 2018.
- [7] Co-Principal Investigator, “Emergent Computation in Collective Decision Making by the Crevice-Dwelling Rock Ant *Temnothorax rugatulus*”, NSF PHY-1505048, \$595,006, May 1, 2016 to April 30, 2019.
- [8] Senior staff, “CPS:Synergy: Collaborative Research: Collaborative Vehicular Systems”, NSF ECCS-1446730, \$914,802, January 1, 2015 to December 31, 2017.
- [9] Senior staff, “Autonomous Driving in Mixed-Traffic Urban Environments”, NSF, ECCS-0931669, \$1,499,833, September 1, 2009 to August 31, 2012.

ACADEMIC  
SERVICE**Arizona State University, Tempe, AZ**

- College of Liberal Arts and Sciences Research Operations Committee, Center for Social Dynamics and Complexity Representative, 2016–present.
- Biosocial Complexity Initiative Directorate, Liaison for Cross-University Activities, 2016–present.
- Engineering Management Undergraduate Program Committee, Member, 2015–present.
- The Biomimicry Center, Associate Director of Research, 2015–present.
- Committee for the Development of Biomimicry and Bio-inspired Research and Education Initiatives at ASU, Chairman. 2013.



- Interdisciplinary Complexity Science Student Organization, Founding faculty co-adviser. 2013.
- COMMITTEE SERVICE
- Officer, IEEE Special Technical Community for Human Computation
- REFeree SERVICE
- 49<sup>th</sup> Annual Conference on Decision and Control
  - International Journal of Control
  - ASME Journal of Dynamic Systems, Measurement, and Control
  - IEEE Transactions on Signal Processing
  - IEEE Transactions on Control Systems Technology
  - IEEE Transactions on Cybernetics
  - IEEE Transactions on Intelligent Transportation Systems
  - The International Journal of Robotics Research
  - Engineering Applications of Artificial Intelligence
  - Journal of Simulation
  - International Journal of Nonlinear Sciences and Numerical Simulation
  - Bioinspiration & Biomimetics
  - Swarm and Evolutionary Computation
  - Journal of the Royal Society Interface
  - Scientific Reports
  - American Naturalist
  - Biology Letters
  - Behavioral Ecology
  - Animal Behaviour
  - Ecology and Evolution
  - Ecological Research
  - Current Zoology
  - Journal of Theoretical Biology
  - International Journal of the Commons
- EDITORIAL SERVICE
- Human Computation, editorial board (2014–)
  - Frontiers in Robotics and AI, Computational Intelligence, review editorial board (2014–)
- CONFERENCE SERVICE
- Publicity Chair: 2018 International Symposium on Distributed Autonomous Robotic Systems (DARS 2018), Boulder, Colorado, 2018.
- Program Committee: 2017 IEEE Symposium on Artificial Life (IEEE ALIFE 2017), Honolulu, Hawaii, 2017.
- Program Committee: 2016 International Symposium on Intelligent Control (ISIC 2016), Buenos Aires, Argentina, September 19–22, 2016.
- Local Organizing Committee: 2015 Conference on Complex Systems (CCS'15), Tempe, AZ, September 28 – October 2, 2015.
- Co-organizer (with Yun Kang) for technical session: “Complex Systems of Social Insects in Research and Education”, 2013 International Symposium on Biomathematics and Ecology Education and Research (BEER 2013), Arlington, VA, October 11–13, 2013.
- Organizer for mini-symposium: “MS19: Optimization and Rationality in Eusocial Insects”, 2013 Society for Mathematical Biology Annual Meeting and Conference (SMB 2013), Tempe, AZ, June 10–13, 2013.
- Organizer/Associate Editor for invited session: “Correctness by Verification and Design”, 14<sup>th</sup> IEEE Conference on Intelligent Transportation Systems (ITSC 2011), Washington, DC, October 5–7, 2011.

- PROFESSIONAL MEMBERSHIPS
- Institute for Operations Research and the Management Sciences (INFORMS), Member, 2015–present
- Applied Probability Society (2015–present)
  - Artificial Intelligence Section (2015–present)
  - Behavioral Operations Management (2015–present)
  - Computing Society (2015–present)
  - Decision Analysis Society (2015–present)
  - Group Decision and Negotiation (2015–present)
  - Optimization Society (2015–present)
  - Organization Science Section (2015–present)
  - Simulation Society (2015–present)
  - Transportation Science and Logistics Society (2015–present)
- Institute for Industrial Engineers (IIE), Member, 2015–present
- Operations Research division (2015–present)
  - Sustainable Development division (2015–present)
- Institute for Electrical and Electronics Engineers (IEEE), Member, 2002–present
- IEEE Control Systems Society (2004–present)
  - IEEE Communications Society (2012–present)
  - IEEE Computer Society (2009–present)
  - IEEE Intelligent Transportation Systems Society (2011–present)
  - IEEE Systems, Man, and Cybernetics Society (2011–present)
  - IEEE Robotics and Automation Society (2011–present)
  - IEEE Computational Intelligence Society (2013–present)
  - IEEE Circuits and Systems Society (2013–present)
  - IEEE Information Theory Society (2013–present)
- Game Theory Society, Member, 2016–present
- Animal Behavior Society (ABS), Member, 2011–present
- International Union for the Study of Social Insects (IUSSI), Member, 2012–present
- North American Section (2012–present)
- Entomological Society of America, Member, 2014–present
- Southwestern and Pacific Branch (2014–present)
  - Systematics, Evolution, and Biodiversity Section (2014–present)
- Society for Mathematical Biology (SMB), Member, 2012–present
- Society for Industrial and Applied Mathematics (SIAM), Member, 2015–present
- OTHER MEETING ATTENDANCE
- Invited Participant**
- 12th Annual National Academies Keck Futures Initiative Conference (NAKFI 2014) on Collective Behavior: From Cells to Societies, November 13–15, 2014
  - 2014 Computing Community Consortium Human Computation Roadmap Summit Workshop, June 18–20, 2014
  - BEYOND Center for Fundamental Concepts in Science Workshop: Complex Systems Theory and Cancer Biology, February 22–23, 2014
- General Participant**
- NSF Workshop on Self-organizing Particle Systems, January 8, 2014
  - 1<sup>st</sup> IEEE/ACM Workshop on Signal Processing Advances in Sensor Networks, April 8, 2013
  - CoMSES Workshop on ABM in Education, February 28 – March 2, 2013
  - 49<sup>th</sup> IEEE Conference on Decision and Control, December 15–17, 2010

## SERVICE

Arizona State University School of Life Sciences Graduate Retreat 2014

- Panelist, “Securing a post-doc” session

Intel International Science and Engineering Fair (ISEF) 2013

- Grand Award Judge for Animal Sciences

Night of the Open Door, Arizona State University, 2013

- Staffed the “Ants of Arizona” exhibit
- Answered questions about ants and research related to them

Recent contributor to several open-source software projects, including:

- Vim-LaTeX suite
- Vimperator and Pentadactyl Firefox extensions
- Git distributed version control system
- Mercurial distributed version control system
- Personal projects archived at <http://hg.tedpavlic.com/>

Frequent contributor to Wikipedia

- Significant contributions to articles on control theory, electronics, and signals and systems.

Contributor to Quora

- Contributions to articles on thermodynamics, chaos theory, electronics, and evolutionary biology.

OSU FIRST Robotics Team, The Ohio State University, 2000–2004

- Introduced middle school and high school students to science and technology by participating with them in national robotics competitions.
- Led 2002 team to regional silver medal Engineering Inspiration Award.
- Lead Team Mentor, 2002–2004
- Component Design Team Lead Mentor, 2001–2002

Ohio Science Olympiad state competition, Robot Ramble Event, 2003

- Supervised setup and judging of event for middle-school and high-school students

Director of Computers, Engineers’ Council, The Ohio State University, 2002

Linux Virtual Server Project, 1999–2000

- Early member of the team that formed the open-source project that is now an important load balancing solution for the Linux software platform.

Greater Columbus Free-Net, 1995–1997

- Provided technical support services.

CompuTeen Bulletin Board System, 1993–1995

- Administrated dial-up bulletin board system.
- Founded and administrated TeenLiNK, an international electronic mail network that spread through the United States, Canada, and Australia and delivered mail over a series of electronic dial-up drop offs.

## AWARDS

National Science Foundation

- GK-12 Graduate Fellowship, 2006–2007
- Graduate Research Fellowship Honorable Mention, 2005

The Ohio State University

- Dean’s Distinguished University (DDU) Graduate Fellowship, 2004–2010
- Electrical and Computer Engineering Bradshaw Scholarship, 2002–2004
- Electrical and Computer Engineering Shafstall Scholarship, 2001–2003
- University Scholarship, 1999–2003

POPULAR MEDIA	<p>Pavlic, T.P. “Be Undisciplined. Lose Your Innocence. Get to Work.” In: TEDxASU 2017: Innovators, March 23, 2017.  <a href="https://youtu.be/9GWXCRetOjk?list=PLsRNoUx8w3rOEkwS6gZashGbH8otAs3l4">https://youtu.be/9GWXCRetOjk?list=PLsRNoUx8w3rOEkwS6gZashGbH8otAs3l4</a></p> <p>Pavlic, T.P. “Cognition in Ants, Robots, and Pre-biotic Chemistries: A Science on Google+ HOA with Dr. Ted Pavlic.” Interview by Chris Robinson. Science on Google+: A Public Database, April 15, 2015. <a href="https://plus.google.com/u/0/events/cmbuh4hdnc558tqg1p86dqna35k">https://plus.google.com/u/0/events/cmbuh4hdnc558tqg1p86dqna35k</a></p> <p>Sigfried, Tom. “If the world is a computer, life is an algorithm”, Science News: Context, June 18, 2014. <a href="https://www.sciencenews.org/blog/context/if-world-computer-life-algorithm">https://www.sciencenews.org/blog/context/if-world-computer-life-algorithm</a></p> <p>“The Free &amp; Unfree: Open Source Everywhere – How a Global Coding Coalition Built an Open Source Superserver”, Wired, 12(06), June 2004.</p>
APPLICATION AREAS	Autonomous/Unmanned Vehicles, Flexible Manufacturing Systems, Distributed Power Generation, Intelligent Lighting, Power Demand Response, Microgrids, Smart Grids
HARDWARE AND SOFTWARE SKILLS	<p>Analog and Digital Electronics:</p> <ul style="list-style-type: none"> <li>• Bipolar and FET implementations of continuous and switched amplifiers, modulators, converters, and filters</li> <li>• Computer-Aided Design Tools: Cadence OrCAD, NI Multisim, SPICE, pst-circ</li> </ul> <p>Embedded and Real-time Systems:</p> <ul style="list-style-type: none"> <li>• Software and hardware development with several MCU and DSP platforms (e.g., Motorola MCU’s, Texas Instruments DSP’s, Atmel ATmega MCU’s, Microchip PIC MCU’s, and others)</li> </ul> <p>Instrumentation, Control, Data Acquisition, Test, and Measurement:</p> <ul style="list-style-type: none"> <li>• dSPACE hardware (e.g., RTI1104) and Control Desk software, Simulink, LabVIEW and other National Instruments control and data acquisition hardware and software (e.g., MIO, SMIO, DSA, DMM, and others), Hewlett-Packard and Agilent bench-top equipment</li> </ul> <p>Computer Programming:</p> <ul style="list-style-type: none"> <li>• C, C++, Java, JavaScript, NetLogo, Pascal, Perl, PHP, Lisp, UNIX shell scripting (including POSIX.2), GNU make, AppleScript, SQL, MySQL, and others</li> </ul> <p>Numerical Analysis:</p> <ul style="list-style-type: none"> <li>• MATLAB, R, Maple, Mathematica</li> </ul> <p>Version Control and Software Configuration Management:</p> <ul style="list-style-type: none"> <li>• DVCS (Mercurial/MQ, Git/StGit), VCS (RCS, CVS, SVN, SCCS), and others</li> </ul> <p>MATLAB skill set:</p> <ul style="list-style-type: none"> <li>• Linear algebra, Fourier transforms, Monte Carlo analysis, nonlinear numerical methods, polynomials, statistics, <math>N</math>-dimensional filters, visualization</li> <li>• Toolboxes: communications, control system, filter design, genetic algorithm and direct search, signal processing, system identification</li> </ul> <p>Software Verification:</p> <ul style="list-style-type: none"> <li>• KeY, PRISM, KeYmaera</li> </ul> <p>Information/Internet Technology:</p> <ul style="list-style-type: none"> <li>• Networking (UDP, TCP, ARP, DNS, Dynamic routing), Services (Apache, SQL, Media-Wiki, POP, IMAP, SMTP, application-specific daemon design)</li> </ul>

Desktop Editing and Productivity Software:

- Vim, Emacs, Eclipse
- T<sub>E</sub>X (L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>, P<sub>S</sub>Tricks),
- Microsoft Office, OpenOffice.org, LibreOffice, Corel WordPerfect, Google Docs
- GIMP, InkScape

Operating Systems:

- Microsoft Windows family, Apple OS X, IBM OS/2, Linux, BSD, IRIX, AIX, Solaris, and other UNIX variants

EXPERTISE

Mathematics:

- Applied Mathematics, Real and Complex Analysis, Measure Theory, Differential Geometry, Game Theory, Graph Theory, Combinatorics

Control Theory and Engineering:

- Linear and Nonlinear Systems Theory, Feedback, Variable Structure Systems and Sliding Modes, Distributed and Intelligent Control, Dynamic Optimization, Biomimicry, Bioinspiration, Hybrid and CyberPhysical Systems

Communications and Signal Processing:

- Probability, Random Variables, Stochastic Processes, Information Theory, Estimation, Networks

Computer Science and Engineering:

- Model Checking (automated, distributed, hybrid, probabilistic), Hybrid Automata, Software Verification, Component-Based Reusable Software

Natural and Social Sciences (Biology, Neuroscience, Psychology, Anthropology):

- Behavioral Ecology, Foraging Theory, Cooperation/Altruism, Impulsiveness, Evolution

REFERENCES  
AVAILABLE TO  
CONTACT

Available upon request. Otherwise, see:

[http://www.tedpavlic.com/engjobsearch/docs/pavlic\\_reference\\_list.pdf](http://www.tedpavlic.com/engjobsearch/docs/pavlic_reference_list.pdf).

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<http://www.tedpavlic.com/engjobsearch/>.