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- Thesis Topic: *Design and Analysis of Optimal Task-Processing Agents*
- Candidacy: *Research Problems in Distributed Control for Energy Systems*

- Adviser: Professor Kevin M. Passino
- Area of Study: Control Engineering

M.S., Electrical and Computer Engineering, August 2007

- Thesis Topic: *Optimal Foraging Theory Revisited*
- Adviser: Professor Kevin M. Passino
- Area of Study: Control Engineering

B.S., Electrical and Computer Engineering, June 2004

- *Magna cum Laude*, With Honors in Engineering
- Electrical specialization (emphasis on electromagnetics and digital computers)
- Minor in Computer and Information Systems (programming and algorithms)

REFEREED  
JOURNAL  
PUBLICATIONS

- [1] 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](https://doi.org/10.1007/s11721-014-0100-8)
- [2] 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](https://doi.org/10.1115/1.4028353)
- [3] 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.2013.227](https://doi.org/10.1109/TCYB.2013.227)
- [4] 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](https://doi.org/10.1177/0278364910396551)
- [5] 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](https://doi.org/10.1007/s10441-010-9107-8)
- [6] 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](https://doi.org/10.1007/s00265-010-0940-1)
- [7] 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](https://doi.org/10.1016/j.engappai.2008.10.017)

CONFERENCE  
PUBLICATIONS

- [8] 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](https://doi.org/10.7551/978-0-262-32621-6-ch083)
- [9] 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)*, May 19, 2014.
- [10] 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)*, December 16–19, 2013.
- [11] 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)*, April 8–11, 2013. doi:[10.1145/2461328.2461349](https://doi.org/10.1145/2461328.2461349)

- [12] 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.
- [13] 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 [14] 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. Anticipated.
- [15] 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.
- [16] 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.
- [17] 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.
- [18] 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.
- [19] 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 [20] 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.
- [21] 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.
- [22] 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.
- [23] 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.
- [24] 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 [25] 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.

- [26] 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. Anticipated.
- [27] 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.
- [28] 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.
- [29] 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.
- [30] 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.
- [31] 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 [32] 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](https://doi.org/10.1007/978-1-4614-8806-4_74)
- OTHER PUBLICATIONS [33] 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.
- [34] 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.
- [35] Pavlic, T.P. *Design and Analysis of Optimal Task-Processing Agents*. PhD thesis, The Ohio State University, Columbus, OH, 2010.
- [36] Pavlic, T.P. *Optimal Foraging Theory Revisited*. Master’s thesis, The Ohio State University, Columbus, OH, 2007.
- BOOKS IN PREPARATION [37] Pavlic, T.P., B.W. Andrews, K.M. Passino, and T.A. Waite. *Foraging Theory for Engineering*. In preparation.
- PAPERS IN PREPARATION [38] 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.
- [39] Pavlic, T.P. Risk-sensitive foraging and the Sharpe ratio.
- GRANTS **Awaiting Decision**
- [1] Senior staff, “A new multi-objective optimization framework for investigating mechanisms of social resource allocation”, NIH, NIGMS, 2015. Revision in progress.

## **Awarded**

- [2] Senior staff, “CPS:Synergy: Collaborative Research: Collaborative Vehicular Systems”, NSF ECCS-1446730, \$914,802, January 1, 2015 to December 31, 2017. Recommended for funding.
- [3] Senior staff, “Autonomous Driving in Mixed-Traffic Urban Environments”, NSF, ECCS-0931669, \$1,499,833, September 1, 2009 to August 31, 2012.

## **Not Awarded**

- [4] Senior staff, “Informational architecture of collective decision making by *Temnothorax* ants”, NSF, POLS, 2013. Not awarded.
- [5] Senior staff, “Biological stoichiometry of horizontal gene transfer and the social dynamics of microbial communities”, Army Research Office, 2013. Not awarded.
- [6] Senior staff, “Biologically-inspired strategies for collective transport and construction by multi-robot systems”, NSF, RI, 2013. Not awarded.
- [7] Co-PI, “An Ant Model System for the Study of Nutrient Balance in Social-Insect Pollinators”, USDA, NIFA-AFRI Foundational proposal, 2013. Not awarded.
- [8] Senior staff, “Cooperative LED Arrays for Preference-Adaptive Lighting in Smart Buildings”, NSF, EFRI-SEED preliminary proposal, 2009. Not awarded.

## ACADEMIC SERVICE

### ***Committee for the Development of Biomimicry and Bio-inspired Research and Education Initiatives at ASU***

Chairman, Arizona State University. 2013.

### ***Interdisciplinary Complexity Science Student Organization***

Founding faculty co-adviser, Arizona State University. Interdisciplinary graduate and undergraduate student group focused on discussion of research topics in complexity science. 2013.

## STUDENT ADVISING

### **Alyssa Adams**

Graduate student in Physics, Arizona State University. Modeling and analysis of top-down causation in self-referencing cellular-automata models of the origins of life. Primary adviser: Sara I. Walker. 2013–2014.

### **Hana Putnam and Alex Nachman**

Undergraduate students in Biology, Arizona State University. Laboratory support of research on decentralized nutrient regulation in *Temnothorax rugatulus* ants. Primary adviser: Stephen C. Pratt. 2013.

### **Taylor Vance and P. Logan Rogers and Betsy Siegworth**

Undergraduate students in Biology, Arizona State University. Laboratory support of research on quorum detection by encounter rate in *Temnothorax rugatulus* ants. Primary adviser: Stephen C. Pratt. 2013.

### **Sean T. Wilson**

Graduate student in Mechanical Engineering, Arizona State University. Dynamical modeling and analysis of the collective carrying behaviors of *Aphaenogaster cockerelli* ants. Primary adviser: Spring Berman. 2012–2013.

### **Ganesh P. Kumar**

Graduate student in Computer Science, Arizona State University. Bio-mimetic design of collective carrying algorithms for robotics, inspired by the ant *Aphaenogaster cockerelli*. Primary adviser: Spring Berman. 2012–2013.

**Christal Johnson**

Undergraduate student in Biology, Arizona State University. Modeling and analysis of quorum detection during emigration behavior in *Temnothorax rugatulus* ants. Honors thesis. Primary adviser: Stephen C. Pratt. 2012.

**Cory Henderson, James O'Donnell, Ian Neack, and Patrick Whewell**

Undergraduate students in Electrical and Computer Engineering, The Ohio State University. Group design project on retrofittable vehicle-to-vehicle communications system for adaptive-cruise-control in mixed-traffic environments. Primary adviser: Keith Redmill. 2012.

**Manas Agrawal** Graduate student in Computer Science and Engineering, The Ohio State University. Software verification and model checking applied to railroad safety problems. Primary adviser: Bruce W. Weide. 2012.

**Sai Prathyusha Peddi** Graduate student in Computer Science and Engineering, The Ohio State University. Software verification applied to adaptive cruise control and instrumented intersection signal timing. Primary adviser: Bruce W. Weide. 2011–2012.

**Jaeyong Park.** Graduate student in Electrical and Computer Engineering, The Ohio State University. Provably correct on-line control synthesis for autonomous vehicles with hybrid dynamics. Primary adviser: Ümit Özgüner. 2011–2012.

TEACHING  
EXPERIENCE**Arizona State University, Tempe, AZ***Guest Lecturer***April 2015**

- ASM 394: Great Adaptations: Origins of Complexity in Nature
  - Undergraduate course in the science and mathematics of anthropology
  - Main instructor: Joan B. Silk
  - Lecture: “Connecting Evolutionary Adaptation and the Engineering Design Process”

*Guest Lecturer***October 2013**

- ANB 601: Research Strategies in Animal Behavior
  - Graduate-level course in animal behavior
  - Main instructor: Ronald L. Rutowski
  - Lecture: “Mathematical, Computational, and Experimental Modeling: Granularity and Parsimony”

**The Ohio State University, Columbus, OH***Instructor***March 2012 to August 2012**

- Instructor for ECE 683: Undergraduate Design Project
  - Students designed retrofittable vehicle-to-vehicle communications system to aid in the development of verifiably safe adaptive cruise control.
  - Design project folded into larger research project on autonomous vehicles in mixed-traffic urban environments.

*Teaching Assistant***September 2007 to August 2009**

(sample graded material and student evaluations available upon request)

- Instructor for ECE 327: Electronic Devices and Circuits Laboratory I
  - Autumn 2007, Winter (2) and Spring 2008 (2), Winter (2) and Summer 2009
  - Responsible for 1-hour lecture and supervision of 3-hour laboratory. Students design and implement infrared modem and 8-ohm speaker driver.
  - Authored hundreds of pages of course material archived at <http://www.tedpavlic.com/teaching/osu/ece327>.



- Grader for ECE 481 Ethics in Electrical and Computer Engineering
  - Autumn 2007 and Autumn 2008
- Instructor for ECE 209: Circuits and Electronics Laboratory
  - Autumn 2008
  - Responsible for lecture and supervision of basic electronics laboratory.
  - Authored material at <http://www.tedpavlic.com/teaching/osu/ece209>.
- Instructor for ECE 557: Control, Signals, and Systems Laboratory
  - Summer 2008 (2 sections) and Summer 2009
  - Responsible for lecture and supervision of laboratory. Students used [Simulink](#) and [dSPACE](#) RTI1104 units for linear system control design.
  - Authored material at <http://www.tedpavlic.com/teaching/osu/ece557>.
- Lab Instructor for ECE 758: Control Systems Implementation Laboratory
  - Spring 2009 (2 sections)
  - Responsible for lecture and supervision of laboratory. Graduate and senior undergraduate students used [Simulink](#), with [dSPACE](#) RTI1104 units for analysis of and advanced control implementation for linear and non-linear systems.
  - Authored material at <http://www.tedpavlic.com/teaching/osu/ece758>.

*National Science Foundation GK-12 Graduate Fellow*

**September 2006 to October 2007**

Developed, implemented, and evaluated daily inquiry-based fourth-grade science lessons for a local inner-city public school class.

*Instructor*

**March 2002 to June 2004**

- Member of [Fundamentals of Engineering for Honors](#) instructional team.
- Special graduate teaching appointment as undergraduate.
- Lectured weekly engineering laboratory for ENG H191, H192, and H193.
- Trained in-class undergraduate teaching assistants in laboratory procedure.
- Graded weekly lab reports and provided laboratory exams.

*Teaching Assistant*

**September 2000 to March 2002**

- Assisted [Fundamentals of Engineering for Honors](#) instructional team.
- Provided support to first-year engineering students (ENG H191, H192, and H193).
- Graded daily assignments on programming and drafting.
- Developed on-line journal system for Physics Education Research Group (PERG).

*Undergraduate Researcher*

**September 2000 to March 2002**

- Participated in the [Europa Undergraduate Research Forum](#), a part of the [Reusable Software Research Group](#).
- Studied component-based software engineering undergraduate pedagogy.
- Researched changes to RESOLVE/C++ implementation for ANSI compliance.

*Grader*

**September 2001 to December 2001**

- Graded daily electromagnetics assignments (ECE 311).

PROFESSIONAL  
SERVICE

**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*
- *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**

- 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 EXPERIENCE**

##### **Arizona State University, Tempe, AZ**

*Assistant Professor*

**August 2015 (upcoming)**

- Joint Appointment:
  - School of Computing, Informatics, and Decision Systems Engineering
  - School of Sustainability
- Graduate faculty in Industrial Engineering/Operations Research, Sustainability, and Animal Behavior.
- Interdisciplinary laboratory focus on decision making and organization.

*Associate Research Scientist*

**August 2014 to present**

*Postdoctoral Scholar*

**July 2012 to August 2014**

- Supervisor: **Professor Stephen C. Pratt**



- Novel application of sophisticated quantitative analysis and modeling techniques to animals, with social insects as a particular focus.
- 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 Priceline.

**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.

PROFESSIONAL MEMBERSHIPS	Institute for Operations Research and the Management Sciences (INFORMS), Member, 2015–present
	<ul style="list-style-type: none"> <li>• Applied Probability Society (2015–present)</li> <li>• Artificial Intelligence Section (2015–present)</li> <li>• Behavioral Operations Management (2015–present)</li> <li>• Computing Society (2015–present)</li> <li>• Decision Analysis Society (2015–present)</li> <li>• Group Decision and Negotiation (2015–present)</li> <li>• Optimization Society (2015–present)</li> <li>• Organization Science Section (2015–present)</li> <li>• Simulation Society (2015–present)</li> <li>• Transportation Science and Logistics Society (2015–present)</li> </ul>
	Institute for Industrial Engineers (IIE), Member, 2015–present
	<ul style="list-style-type: none"> <li>• Operations Research division (2015–present)</li> <li>• Sustainable Development division (2015–present)</li> </ul>
	Institute for Electrical and Electronics Engineers (IEEE), Member, 2002–present
	<ul style="list-style-type: none"> <li>• IEEE Control Systems Society (2004–present)</li> <li>• IEEE Communications Society (2012–present)</li> <li>• IEEE Computer Society (2009–present)</li> <li>• IEEE Intelligent Transportation Systems Society (2011–present)</li> <li>• IEEE Systems, Man, and Cybernetics Society (2011–present)</li> <li>• IEEE Robotics and Automation Society (2011–present)</li> <li>• IEEE Computational Intelligence Society (2013–present)</li> <li>• IEEE Circuits and Systems Society (2013–present)</li> <li>• IEEE Information Theory Society (2013–present)</li> </ul>
	Animal Behavior Society (ABS), Member, 2011–present
	International Union for the Study of Social Insects (IUSSI), Member, 2012–present
	<ul style="list-style-type: none"> <li>• North American Section (2012–present)</li> </ul>
	Entomological Society of America, Member, 2014–present
	<ul style="list-style-type: none"> <li>• Southwestern and Pacific Branch (2014–present)</li> <li>• Systematics, Evolution, and Biodiversity Section (2014–present)</li> </ul>
OTHER MEETING ATTENDANCE	Society for Mathematical Biology (SMB), Member, 2012–present
	Society for Industrial and Applied Mathematics (SIAM), Member, 2015–present
	<b>Invited Participant</b>
	<ul style="list-style-type: none"> <li>• 12th Annual National Academies Keck Futures Initiative Conference (NAKFI 2014) on Collective Behavior: From Cells to Societies, November 13–15, 2014</li> <li>• 2014 Computing Community Consortium Human Computation Roadmap Summit Workshop, June 18–20, 2014</li> <li>• BEYOND Center for Fundamental Concepts in Science Workshop: Complex Systems Theory and Cancer Biology, February 22–23, 2014</li> </ul>
	<b>General Participant</b>
	<ul style="list-style-type: none"> <li>• NSF Workshop on Self-organizing Particle Systems, January 8, 2014</li> <li>• 1<sup>st</sup> IEEE/ACM Workshop on Signal Processing Advances in Sensor Networks, April 8, 2013</li> <li>• CoMSES Workshop on ABM in Education, February 28 – March 2, 2013</li> <li>• 49<sup>th</sup> IEEE Conference on Decision and Control, December 15–17, 2010</li> </ul>
SERVICE	Arizona State University School of Life Sciences Graduate Retreat 2014
	<ul style="list-style-type: none"> <li>• Panelist, “Securing a post-doc” session</li> </ul>

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.

APPLICATION AREAS	Autonomous and 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>

Instrumentation, Control, Data Acquisition, Test, and Measurement:

- 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

Computer Programming:

- C, C++, Java, JavaScript, NetLogo, Pascal, Perl, PHP, Lisp, UNIX shell scripting (including POSIX.2), GNU make, AppleScript, SQL, MySQL, and others

Numerical Analysis:

- MATLAB, R, Maple, Mathematica

Version Control and Software Configuration Management:

- DVCS (Mercurial/MQ, Git/StGit), VCS (RCS, CVS, SVN, SCCS), and others

[MATLAB](#) skill set:

- Linear algebra, Fourier transforms, Monte Carlo analysis, nonlinear numerical methods, polynomials, statistics,  $N$ -dimensional filters, visualization
- Toolboxes: communications, control system, filter design, genetic algorithm and direct search, signal processing, system identification

Software Verification:

- KeY, PRISM, KeYmaera

Information/Internet Technology:

- Networking (UDP, TCP, ARP, DNS, Dynamic routing), Services (Apache, SQL, MediaWiki, POP, IMAP, SMTP, application-specific daemon design)

Desktop Editing and Productivity Software:

- Vim, Emacs, Eclipse
- $\text{\TeX}$  ( $\text{\LaTeX}$ ,  $\text{\BIBTeX}$ , PSTricks),
- 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, Altruism, Impulsiveness, Evolution

## 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

Pavlic, Theodore 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. <https://plus.google.com/u/0/events/cmbuh4hdnc558tqg1p86dqna35k>

Sigfried, Tom. “If the world is a computer, life is an algorithm”, *Science News: Context*, June 18, 2014. <https://www.sciencenews.org/blog/context/if-world-computer-life-algorithm>

“The Free & Unfree: Open Source Everywhere – How a Global Coding Coalition Built an Open Source Superserver”, *Wired*, 12(06), June 2004.

## SECURITY CLEARANCE

Department of Defense Top Secret SCI with polygraph (expired: 2002)

## REFERENCES

## AVAILABLE TO CONTACT

**Dr. Stephen C. Pratt** (e-mail: [stephen.pratt@asu.edu](mailto:stephen.pratt@asu.edu); phone: +1-480-727-9425)

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- ★ *Dr. Pratt is my current postdoctoral supervisor.*

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- ◇ School for Engineering of Matter, Transport, and Energy, PO Box 876106, Tempe, AZ 85287-6106
- ★ *Dr. Berman is collaborator on my bio-mimicry work.*

**Dr. Paul C. W. Davies** (e-mail: [Paul.Davies@asu.edu](mailto:Paul.Davies@asu.edu); phone: +1-480-965-3240)

- Regents Professor and Director, Beyond Center for Fundamental Concepts in Science, Arizona State University
- ◇ Beyond Center for Fundamental Concepts in Science, P.O. Box 871504, Tempe, AZ 85287-1504
- ★ *Dr. Davies is collaborator on my origins-of-life work.*

**Dr. Sara Imari Walker** (e-mail: [sara.i.walker@asu.edu](mailto:sara.i.walker@asu.edu); phone: +1-480-727-2394)

- Assistant Professor, School of Earth and Space Exploration, Arizona State University
- ◇ ASU School of Earth and Space Exploration, PO Box 871404, Tempe, AZ 85287-1404
- ★ *Dr. Walker is collaborator on my origins-of-life work.*

**Dr. Pietro Michelucci** (e-mail: [pem@thinksplash.com](mailto:pem@thinksplash.com); phone: +1-571-235-3288)

- Principal, ThinkSplash LLC, Washington, DC
- ★ *I co-authored a chapter in the Handbook of Human Computation, for which Dr. Michelucci was the editor-in-chief.*

**Dr. Paolo A. G. Sivilotti** (e-mail: [sivilotti.1@osu.edu](mailto:sivilotti.1@osu.edu); phone: +1-614-292-5835)

- Associate Professor, Computer Science and Engineering, The Ohio State University
- ◇ 395 Drees Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Sivilotti is my past postdoctoral supervisor.*

**Dr. Bruce W. Weide** (e-mail: [weide.1@osu.edu](mailto:weide.1@osu.edu); phone: +1-614-292-1517)

- Professor and Associate Chair, Computer Science and Engineering  
The Ohio State University
- ◇ 395 Drees Laboratories, 2015 Neil Ave., Columbus, OH 43210

★ *Dr. Weide is a co-PI on the NSF grant that funded my previous postdoctoral position.*

**Dr. Ian M. Hamilton** (e-mail: [hamilton.598@osu.edu](mailto:hamilton.598@osu.edu); phone: +1-614-292-9147)

- Assistant Professor, [Evolution, Ecology, and Organismal Biology and Mathematics](#)  
[The Ohio State University](#)
- ◇ 300 Aronoff Laboratory, 318 W. 12th Avenue, Columbus, OH 43210
- ★ *Dr. Hamilton has been a valuable interdisciplinary resource to me.*

**Dr. Kevin M. Passino** (e-mail: [passino.1@osu.edu](mailto:passino.1@osu.edu); phone: +1-614-312-2472)

- Professor, [Electrical and Computer Engineering](#), [The Ohio State University](#)
- ◇ 205 Drees Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Passino was my graduate adviser.*

**Dr. Andrea Serrani** (e-mail: [serrani.1@osu.edu](mailto:serrani.1@osu.edu); phone: +1-614-292-4976)

- Associate Professor, [Electrical and Computer Engineering](#)  
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- ★ *Dr. Serrani was a member of my doctoral committee.*

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- Professor of Practice, [Mechanical and Aerospace Engineering](#)  
[The Ohio State University](#)
- ◇ 244 Hitchcock Hall, 2070 Neil Ave., Columbus, OH 43210
- ★ *Dr. Freuler coordinates the Fundamentals of Engineering for Honors program in which I served as an instructor early in my academic career.*

**Dr. George H. Staab** (e-mail: [staab.1@osu.edu](mailto:staab.1@osu.edu); phone: +1-614-292-7920)

- Associate Professor, [Mechanical and Aerospace Engineering](#)  
[The Ohio State University](#)
- ◇ W192 Scott Laboratory, 201 W. 19th Ave., Columbus, OH 43210
- ★ *Dr. Staab is the faculty adviser for the OSU FIRST robotics and engineering outreach group of which I was a four-year member and team leader.*

**Dr. Clayton Daigle** (e-mail: [Clayton.Daigle@silabs.com](mailto:Clayton.Daigle@silabs.com); phone: +1-512-532-5935)

- Mixed-Signal Engineer, [Silicon Laboratories](#), Austin, TX
- ★ *Dr. Daigle was my direct supervisor when I worked for National Instruments as an analog hardware R&D engineer.*

MORE  
INFORMATION

More information and auxiliary documents can be found at  
<http://www.tedpavlic.com/facjobsearch/>.