

Theodore (Ted) P. Pavlic

CONTACT INFORMATION	Department of Computer Science and Engineering The Ohio State University 395 Dreese Labs 2015 Neil Avenue Columbus, OH 43210 USA	<i>Mobile:</i> +1-760-483-3390 <i>Fax:</i> +1-614-292-2911 <i>E-mail:</i> pavlic.3@osu.edu <i>WWW:</i> www.tedpavlic.com
OBJECTIVE	Placement in an academic position (i.e., faculty, postdoctoral, or research scientist) that allows for advanced research in distributed complex adaptive systems (i.e., modeling, analysis, design, and verification) with a particular focus on the control of engineered agents (e.g., for communications, control, software, and electronics applications) and the analysis of biological phenomena (e.g., self-organization, ecological rationality) <ul style="list-style-type: none">• More information and auxiliary documents can be found at http://www.tedpavlic.com/facjobsearch/	
SECURITY CLEARANCE	Department of Defense Top Secret SCI with polygraph (expired: 2002)	
RESEARCH INTERESTS	Agent-based modeling, hybrid systems, distributed algorithms, amorphous computing, autonomous systems and vehicles, control theory, communication theory, behavioral ecology, cooperation theory, optimization, game theory, parallel computation, robotics, engineering education, bio-mimicry and bio-inspiration	
EDUCATION	The Ohio State University , Columbus, Ohio USA Ph.D., Electrical and Computer Engineering, August 2010 <ul style="list-style-type: none">• Thesis Topic: <i>Design and Analysis of Optimal Task-Processing Agents</i>• Thesis Proposal: <i>Cooperative Task Processing</i>• Candidacy: <i>Research Problems in Distributed Control for Energy Systems</i>• Adviser: Professor Kevin M. Passino• Area of Study: Control Engineering M.S., Electrical and Computer Engineering, August 2007 <ul style="list-style-type: none">• Thesis Topic: <i>Optimal Foraging Theory Revisited</i>• Adviser: Professor Kevin M. Passino• Area of Study: Control Engineering B.S., Electrical and Computer Engineering, June 2004 <ul style="list-style-type: none">• <i>Magna cum Laude</i>, With Honors in Engineering• Electrical specialization (emphasis on electromagnetics and digital computers)• Minor in Computer and Information Systems (programming and algorithms)	
ACADEMIC APPOINTMENTS	Postdoctoral Researcher Department of Computer Science and Engineering, The Ohio State University <ul style="list-style-type: none">• National Science Foundation Cyber-Physical Systems (ENG, ECCS)<ul style="list-style-type: none">– Autonomous Driving in Mixed-Traffic Urban Environments (grant #0931669)– Supervisor (co-PI): Professor Paolo A. G. Sivilotti– PI: Professor Ümit Özgüner	September 2010 to present

REFEREED
JOURNAL
PUBLICATIONS

- 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
- 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
- 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
- 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

SUBMITTED
JOURNAL
PUBLICATIONS

- Pavlic, T.P., and K.M. Passino. Cooperative task processing. *IEEE Transactions of Automatic Control*. 2010. Submitted.

CONFERENCE
PUBLICATIONS

- 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.
- 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.
- Pavlic, T.P. Stigmergic memory for real-time primal-space distributed optimization under constraints. In: *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference (CDC-ECC 2011)*, December 12–15, 2011. Submitted.
- 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.
- 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.
- 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.

OTHER
PUBLICATIONS

- 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.
- 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.
- Pavlic, T.P. *Design and Analysis of Optimal Task-Processing Agents*. PhD thesis, The Ohio State University, Columbus, OH, 2010.
- Pavlic, T.P. *Optimal Foraging Theory Revisited*. Master’s thesis, The Ohio State University, Columbus, OH, 2007.

BOOKS IN PREPARATION	Pavlic, T.P., B.W. Andrews, K.M. Passino, and T.A. Waite. <i>Foraging Theory for Engineering</i> .
PAPERS IN PREPARATION	Pavlic, T.P., K.M. Passino. Distributed optimization under constraints: Pareto-optimal intelligent lighting. Pavlic, T.P. The ideal free distribution as degenerate form of nutrient-constrained optimization.
REFeree SERVICE	<ul style="list-style-type: none"> • 49th Annual Conference on Decision and Control • Bioinspiration & Biomimetics • Behavioral Ecology • IEEE Transactions on Signal Processing • The International Journal of Robotics Research • Swarm and Evolutionary Computation • IEEE Transactions on Control Systems Technology
CONFERENCE SERVICE	Organizer/Associate Editor for invited session: “Correctness by Verification and Design”, 14 th IEEE Conference on Intelligent Transportation Systems (ITSC 2011), Washington, DC, October 5–7, 2011.
AWARDS	<p>National Science Foundation</p> <ul style="list-style-type: none"> • GK-12 Fellowship, 2006–2007 • Graduate Research Fellowship Honorable Mention, 2005 <p>The Ohio State University</p> <ul style="list-style-type: none"> • Dean’s Distinguished University Fellowship, 2004–2010 • Electrical and Computer Engineering Bradshaw Scholarship, 2002–2004 • Electrical and Computer Engineering Shafstall Scholarship, 2001–2003 • University Scholarship, 1999–2003
TEACHING EXPERIENCE	<p>The Ohio State University, Columbus, Ohio USA</p> <p><i>Teaching Assistant</i> September 2007 to August 2009 (sample graded material and student evaluations available upon request)</p> <ul style="list-style-type: none"> • Instructor for ECE 327: Electronic Devices and Circuits Laboratory I <ul style="list-style-type: none"> • Autumn 2007, Winter 2008 (2 sections), Spring 2008 (2 sections), Winter 2009 (2 sections), and Summer 2009 • Sample student evaluations available upon request • Responsible for 1 hour lecture and supervision of 3 hour laboratory where junior and senior undergraduate students design and implement infrared modem and speaker driver for analog electronic audio signals • Developed hundreds of pages of supplementary course material, including a course web page archived at http://www.tedpavlic.com/teaching/osu/ece327 • Grader for ECE 481 Ethics in Electrical and Computer Engineering <ul style="list-style-type: none"> • Autumn 2007 and Autumn 2008 • Instructor for ECE 209: Circuits and Electronics Laboratory <ul style="list-style-type: none"> • Autumn 2008 • Sample student evaluations available upon request • Responsible for 0.5 hour lecture and supervision of 3.5 hour laboratory where sophomore undergraduate students learn how to use basic laboratory equipment to study properties of electronic circuits • Developed supplementary course material, including a course web page archived at http://www.tedpavlic.com/teaching/osu/ece209

- Instructor for ECE 557: Control, Signals, and Systems Laboratory
 - Summer 2008 (2 sections) and Summer 2009
 - Sample student evaluations available upon request
 - Responsible for 0.5 hour lecture and supervision of 3.5 hour laboratory where senior undergraduate students combine [Simulink](#), with [dSPACE RTI1104](#) real-time control hardware and software to do analysis and control implementation for linear systems
 - Developed supplementary course material, including a course web page archived at <http://www.tedpavlic.com/teaching/osu/ece557>
- Lab Instructor for ECE 758: Control Systems Implementation Laboratory
 - Spring 2009 (2 sections)
 - Sample student evaluations available upon request
 - Responsible for 0.5 hour lecture and supervision of 3.5 hour laboratory where graduate students and senior undergraduate students combine [Simulink](#), with [dSPACE RTI1104](#) real-time control hardware and software to do analysis and advanced control implementation for linear and non-linear systems
 - Developed supplementary course material, including a course web page archived at <http://www.tedpavlic.com/teaching/osu/ece758>

National Science Foundation GK-12 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 in-class support to first-year engineering students (ENG H191, H192, and H193).
- Graded daily assignments on programming and drafting.
- Developed on-line journal submission and report 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
EXPERIENCE

National Instruments, Austin, Texas USA

Hardware R&D Intern for Multifunction DAQ **June 2003 to September 2003**

- Designed final verification testing 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 on new 16-bit 800 kHz NI-6120 SMIO DAQ board.
- Designed high quality filter/amplifier source for use with NI-5411 arbitrary function generator.

IBM Network Storage, Research Triangle Park, North Carolina USA

Core Systems Software Developer for FlexNAS **June 2001 to September 2001**

- Designed and implemented high-availability, redundant multihop communications subsystem.
- Participated in software development of various vital box services.

CallTech Communications, Columbus, Ohio USA

Information Technology Systems Engineer **June 1997 to May 2001**

- Responsible for the acquisition, setup, maintenance, and administration of all Internet hardware and software supporting **NetWalk** Internet service and web presence provider.
- Designed and implemented state of the art open source high-availability load balancing system supporting thousands of virtual servers.
- Developed software call center support software for clients such as CompuServe, AOL, and Priceline.

MegaLinux Communications, Dublin, Ohio USA

Web Developer and Support Representative **June 1995 to May 1997**

- Produced web content for commercial clients.
- Assisted in administration of UltraSPARC, x86, 68020, 68030, and PowerPC systems running Sun Solaris, Linux, Microsoft DOS, Microsoft Windows NT, and Apple Macintosh operating systems.
- Developed multi-platform open source file sharing solution.
- Provided technical support for Internet and web presence customers.

SERVICE

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.

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

Institute for Electrical and Electronics Engineers (IEEE), Member, 2002–present

- IEEE Control Systems Society (2004–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)

Animal Behavior Society, Member, 2011–present

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
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HARDWARE AND SOFTWARE SKILLS	Analog and Digital Electronics: <ul style="list-style-type: none">• Bipolar and FET implementations of continuous and switched amplifiers, modulators, converters, and filters• Computer-Aided Design Tools: Cadence OrCAD, NI Multisim, SPICE, pst-circ
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Embedded and Real-time Systems:

- 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)

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, MATLAB, Maple, Mathematica, and others

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)

Productivity Applications:

- \LaTeX (\LaTeX , \BibTeX , \PSTricks), Vim, most common productivity packages (for Windows, OS X, and Linux platforms)

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, Bio-inspiration, 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 Sciences (Biology, Neuroscience, Psychology, Anthropology):

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

REFERENCES
AVAILABLE TO
CONTACT

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

- Professor, Electrical and Computer Engineering, The Ohio State University
- ◊ 205 Dreese Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Passino was my graduate adviser.*

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

- Professor and Associate Chair, Computer Science and Engineering
The Ohio State University
- ◊ 395 Dreese Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Weide is a co-PI on the NSF grant that funds my current postdoctoral position.*

Dr. Ian M. Hamilton (e-mail: 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. Andrea Serrani (e-mail: serrani.1@osu.edu; phone: +1-614-292-4976)

- Associate Professor, Electrical and Computer Engineering
The Ohio State University
- ◊ 205 Dreese Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Serrani was a member of my doctoral committee.*

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

- Associate Professor, Computer Science and Engineering, The Ohio State University
- ◊ 395 Dreese Laboratories, 2015 Neil Ave., Columbus, OH 43210
- ★ *Dr. Sivilotti is a co-PI on the NSF grant that funds my current postdoctoral position.*

Dr. Richard J. Freuler (e-mail: freuler.1@osu.edu; phone: +1-614-688-0499)

- 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; 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; 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.*