David P. Larson

Contact Information

Graduate Researcher
Department of Mechanical and Aerospace Engineering
University of California, San Diego
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Research Interests

Complex adaptive systems with applications in control systems engineering and behavioral science: distributed algorithms, agent-based modeling, hybrid dynamic systems, amorphous computing, autonomous systems, control, communications, verification, cooperation, optimization, game theory, resource allocation, parallel computation, robotics, behavioral ecology, engineering education, bio-mimicry and bio-inspiration

Academic Appointments

Postdoctoral Researcher September 2010 to present

Department of Computer Science and Engineering, The Ohio State University

- 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

Education

The Ohio State University, Columbus, OH

Ph.D., Electrical and Computer Engineering, August 2010

- 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)

Other Publications

[1] 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.

[2] 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.

[3] Pavlic, T.P. *Design and Analysis of Optimal Task-Processing Agents*. PhD thesis, The Ohio State University, Columbus, OH, 2010.

[4] Pavlic, T.P. *Optimal Foraging Theory Revisited*. Master's thesis, The Ohio State University, Columbus, OH, 2007.

Professional Memberships

American Society of Mechanical Engineers (ASME), Member, 2009–present

Engineers for a Sustainable World (ESW), Member, 2011–present

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/`

Application Areas

Autonomous and Unmanned Vehicles, Flexible Manufacturing Systems, Distributed Power Generation, Intelligent Lighting, Power Demand Response, Microgrids, Smart Grids

Hardware and Software Skills

Analog and Digital Electronics:

- Bipolar and FET implementations of continuous and switched amplifiers, modulators, converters, and filters
- Computer-Aided Design Tools: Cadence OrCAD, NI Multisim, SPICE, pstcirc

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:

- Matlab, Mathematica, Python, PHP, MySQL, Unix shell scripting, Ruby

Version Control and Software Configuration Management:

- Distributed Revision Control Systems (Git)

MATLAB skill set:

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

Information/Internet Technology:

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

Productivity Applications:

- TEX (LATEX, BIBTEX), 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, 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 Sciences (Biology, Neuroscience, Psychology, Anthropology):

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

AWARDS

National Science Foundation

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

The Ohio State University

- 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

Security Clearance

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

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.*

MORE INFORMATION

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