

Kagan Tumer

Professor

Oregon State University

School of Mechanical, Industrial and Manufacturing Engineering

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RESEARCH FOCUS:

Expertise in autonomy, control and optimization in real world systems operating in stochastic and dynamic environments. Recent application domains include:

- Air Traffic Flow Management
- Autonomous UAV Control
- Multiple Robot, Vehicle Coordination
- Traffic Flow Optimization, Toll Design
- Spacecraft/Aircraft Control & System Design
- Vehicle Fleet Management and Logistics
- Creativity and Optimization in Product Design
- Satellite Constellation Coordination
- Wave Energy Buoy Design Optimization
- Distributed Sensor Placement/Control for Energy Systems

EDUCATION:

The University of Texas, Austin, Texas

Ph.D., Electrical and Computer Engineering, May 1996.

Dissertation title: *Linear and Order Statistics Combiners for Reliable Pattern Recognition*

Advisor: Prof. Joydeep Ghosh

M.S., Electrical and Computer Engineering, August, 1992.

Thesis title: *Structural Adaptation and Generalization in Neural Networks*

George Mason University, Fairfax, Virginia

B.S. (with distinction), Electrical Engineering, May, 1989.

PROFESSIONAL EXPERIENCE:

Oregon State University, Corvallis, OR.

September 2006 - Present

Professor, Dynamics and Control.

June 2010 - Present

School of Mechanical Industrial and Manufacturing Engineering.

Autonomous Agents and Distributed Intelligence Lab, Founder/Lead.

Associate Professor, Dynamics and Control.

Sept 2006-June 2010

Zebigo.com, Spokane, WA.

May 2008 - 2012

Chief Scientist.

Direct system architecture and algorithms for intelligent logistics and transportation.

Engage in fund-raising activities.

NASA Ames Research Center, Moffett Field, CA.

September 1999 - September 2006

Senior Research Scientist/Group Lead, Intelligent Systems Division.

Formed and led group on control and coordination in complex systems.

Performed research on machine learning, multiagent systems and control of complex systems.

Planned program activities for applying AI techniques to spacecraft systems/air transportation systems.

Caelum Research Corp, NASA Ames Res Ctr, Moffett Field, CA. July 1997 - September 1999
Research Scientist, Intelligent Systems Division.
Performed research on machine learning, multiagent systems and control of complex systems.

The University of Texas, San Antonio, TX. September 1996 - June 1997
Visiting Assistant Professor, Division of Engineering.
Performed research on classifier combining.
Taught undergraduate classes; Designed and taught graduate class.

The University of Texas, Austin, TX. September 1992 - May 1997
Research Associate, Laboratory for Artificial Neural Systems, (September 1996 - June 1997).
Graduate Research Assistant, Department of Electrical and Computer Engineering.
Graduate Teaching Assistant for “Artificial Neural Networks,” ECE, (Spring 1994, Spring 1995).

Consulting with Halliburton Logging Services, Austin, TX. September - December 1993.
Consultant, Generated correction charts for resistivity logging tools.

Tracor Inc., Austin, TX. June - August 1992
Engineer, Research and Development.
Explored classifier combining strategies.

Halliburton Logging Services, Austin, TX. November 1989 - September 1991
Engineer, Austin Research Center.
Developed models for correcting borehole instrument readings.

FUNDED PROPOSALS:

Oregon State University (September 2006 to Present):

Total Funding:	\$ 3,324,679
My Share:	\$ 2,382,352

1. **Kagan Tumer (PI)**, “Intelligent Optimization of SuperTruck Routing and Fleet Operation,” **Daimler Trucks, North America** (As a subcontractor on DOE proposal; funds include Oregon Metal Initiative cost share). June 2010–May 2013.
2. Tom Dietterich (PI), Alan Fern, Prasad Tadepalli, **Kagan Tumer**, Weng-Keen Wong, “A compute cluster and software tools for Monte-Carlo methods in artificial intelligence,” **NSF** (CNS, Computing Research Infrastructure), July 2010–July 2013.
3. **Kagan Tumer (PI)**, “Distributed Sensor Coordination for Advanced Energy Systems,” **U.S. Department of Energy**, Fundamental Developments in Sensors and Controls for Power and Fuel Systems Program, November 2009–October 2012.
4. **Kagan Tumer (PI)**, “Distributed Coordination of Agents for Air Traffic Flow Management,” **NSF** (CNS, Cyber-Physical Systems), September 2009–September 2012,.
5. Irem Tumer (PI), **Kagan Tumer** and Rob Stone, “Quantifying Creativity in Automated Design through a Multiagent Coordination Framework,” **NSF** (CMMI, Engineering Design and Innovation), July 2009–July 2012.
6. Ted Brekken (PI), Alex Yokochi, **Kagan Tumer** and Annette Von Jouanne, “Direct Drive Wave Energy Buoys,” **U.S. Department of Energy**, Advanced Water Power Program (with Columbia Power Technologies LLC), October 2009–October 2011.

7. **Kagan Tumer (PI)**, “Coordinating Learning Agents for Active Information Collection,” **Air Force Office of Scientific Research** (AFOSR, Distributed Intelligence). April 2008–March 2011.
8. **Kagan Tumer (PI)**, “Foundations of Multiagent Control in Complex Environments,” **NSF** (IIS, Robust Intelligence), March 2009–September 2010.
9. **Kagan Tumer (PI)**, “Adaptive Methods for Robust Commercial Vehicle Control, Routing and Operation,” **Daimler Trucks North America**. September 2008–May 2010.
10. **Kagan Tumer (PI)**, “Robust Commercial Vehicle Control, Routing and Operation,” **Oregon Metal Initiative**, September 2008–May 2009.
11. **Kagan Tumer (PI)**, “Autonomous Vehicle Testing Platform,” Certificate of Participation Fund, College of Engineering, Oregon University System, Fall 2008.
12. **Kagan Tumer (PI)**, “Small Robots and Artificial Terrain,” The William and Flora Hewlett Foundation, Engineering Schools of the West initiative, Mini-grant, Fall 2007.

NASA Ames Research Center (1999 to 2006):

Total Funding:	\$ 3,380,000
My Share:	\$ 2,132,500

1. **Kagan Tumer (PI)**, “Complex Interaction Discovery,” *Concepts and Tools Program*, NASA, 2005. In *System Reasoning and Risk Management Program*.
2. **Kagan Tumer (PI)**, “Complex Systems Research,” *Engineering Complex Systems Program*, NASA, 2004.
3. David Wolpert (PI) and **Kagan Tumer**, “Self-Dissimilarity: An empirical measure of complexity,” *Director’s Discretionary Funding*, NASA Ames Research Center. 2002-2003.
4. David Wolpert (PI) and **Kagan Tumer**, “Artificial Collective Intelligence,” *Intelligent Systems Program*, NASA, directed funding, 2002-2003.
5. David Wolpert (PI) and **Kagan Tumer**, “Artificial Collective Intelligence,” *Thinking Systems Program* (NRA-632), NASA, 1999-2001.
6. Paul Stolorz (PI), F. Carsey, Eric Mjølness, Kagan Tumer, David Wolpert. “Science Directed Autonomy for Astrobiology Missions.” *Thinking Systems Program*, (NRA-632), NASA, 1999.
7. Michael New (PI), **Kagan Tumer**, Charles Blackwell. “Fundamental Properties of Autocatalytic Systems,” *Computational Astrobiology Program*, NASA, 2000-2002.

PATENT:

Spectroscopic detection of cervical pre-cancer using radial basis function networks. US patent no. 6,135,965 (Oct. 2000). Inventors: K. Tumer, N. Ramanujam, R. Richards-Kortum and J. Ghosh.

AWARDS:

- **Best Paper Award:** “Distributed Agent-Based Air Traffic Flow Management,” K. Tumer and A. Agogino. *Sixth international conference on “Autonomous Agents and MultiAgent Systems*, May 2007. (Best paper out of 531 submissions).
- **Nomination for Best Real World Applications Paper Award:** “Robust Neuro-Control for A Micro Quadrotor,” J. Shepherd III and K. Tumer. *The Genetic and Evolutionary Computation Conference*, Portland OR, July 2010.

- **Nomination for Best Real World Applications Paper Award:** “A Neuro-Evolutionary Approach to Micro Aerial Vehicle Control,” M. Salichon and K. Tumer. *The Genetic and Evolutionary Computation Conference*, Portland OR, July 2010.
- 1st Runner up for **Best Theoretical Development Paper Award:** “Fast Multiagent Learning: Cashing in on Team Knowledge.” N. Khani and K. Tumer. In *18th International Conference on Artificial Neural Networks in Engineering*, St. Louis, MO, November 2008.
- 2nd Runner up for **Best Application Paper Award:** “Neuro-Evolutionary Navigation for Resource-Limited Mobile Robots,” M. Knudson and K. Tumer In *18th International Conference on Artificial Neural Networks in Engineering*, St. Louis, MO, November 2008.

PROFESSIONAL ACTIVITIES:

Journal, Book Series Editorships:

Editorial Board, *Journal of Autonomous Agents and Multi-Agent Systems*, (Springer), 2010–present.
Section Editor for Computer Science, *Advances in Complex Systems* (World Scientific), 2007–2011.
Associate Editor, *Pattern Recognition Letters* (Elsevier), 2004–2007.
Guest Editor, *Information Fusion*, special issue on “Application of Ensemble Methods” (co-editor: N. Oza; Editor-in-Chief: B. V. Dasarathy; Elsevier) 2007.
Board of Associate Editors, *Complex Systems and Inter-Disciplinary Science* book series (World Scientific) 2004–2008.

Conference Organization:

Program Co-Chair for the 10th International Conference on “Autonomous Agents and MultiAgent Systems (AAMAS),” Taiwan, May 2011.
Workshops Chair for the 9th International Conference on “Autonomous Agents and MultiAgent Systems (AAMAS),” Toronto, Canada, May 2010.
Co-Chair of the 19th “Artificial Neural Networks in Engineering” Conference, St. Louis, MO November 2009.

Workshop/Symposium Organization:

Co-Chair of the “Adaptive and Learning Agents (ALAg)” workshop at *AAMAS 2007*, Honolulu, HI, May 2007.
Co-Chair of the “Collectives and the Design of Complex Systems” workshop at *Stanford University*, Stanford, CA, August 2003.
Co-Chair of the “Collectives and the Design of Complex Systems” workshop at *NASA Ames Research Center*, Moffett Field, CA, August 2002.
Co-Chair of the “Distributed Learning for Optimization” special session in the *Congress on Evolutionary Computation (CEC)*, Honolulu, HI, May 2002.
Co-Chair of the “Collaborative Learning Agents” Symposium at *AAAI Spring symposium*, Stanford, CA, March 2002.
Co-Chair of the “Behavior of Collectives: Mathematical Foundations of Distributed Intelligence” workshop at *the Santa Fe Institute*, Santa Fe, NM, January 2002.
Co-Chair of the “Turnkey Algorithms for Improving Generalizers” workshop at *NIPS 1998*, Denver, CO, December 1998.

Technical Program Committees for Conference:

International Joint Conference on Artificial Intelligence (IJCAI): Senior Program Committee: 2011.
American Association for Artificial Intelligence Conference (AAAI): 2011, 2012.
Autonomous Agents and Multi Agent Systems (AAMAS), Senior Program Committee: 2006, 2008, 2012.
Autonomous Agents and Multi Agent Systems (AAMAS): 2004-2008.
International Conference on Machine Learning (ICML): 2003, 2007, 2008.
American Association for Artificial Intelligence Conference (AAAI), Nectar: 2007, 2008.

International Conference on Pattern Recognition (ICPR): 2006.
Genetic and Evolutionary Computation Conference (GECCO): 2006-2007.
Multiple Classifier Systems (MCS): 2001-2005.
Artificial Neural Networks in Engineering (ANNIE): 1999-2008.
International Joint Conference on Neural Networks (IJCNN): 2001-2007.

Technical Program Committees for Workshops:

Adaptive and Learning Agents (ALA) (at AAMAS 2011), Taipei, Taiwan, May 2011.
Agents in Traffic and Transportation (at AAMAS 2010), Toronto, Canada, May 2010.
Adaptive and Learning Agents (ALA) (at AAMAS 2010), Toronto, Canada, May 2010.
Evolutionary Computation and Multi-Agent Systems and Simulation (at GECCO 2010) Portland, OR, July 2010.
Adaptive and Learning Agents (ALA) (at AAMAS 2009), Budapest, Hungary, May 2009.
Evolutionary Computation and Multi-Agent Systems and Simulation (at GECCO 2008) Atlanta, GA, July 2008.
Adaptive and Learning Agents and Multiagent Systems (ALAg+ALAMAS) (at AAMAS 2008), Estoril, Portugal, May 2008.
Agents in Traffic and Transportation (at AAMAS 2008), Estoril, Portugal, May 2008.
Evolutionary Computation and Multi-Agent Systems and Simulation (at GECCO 2007) London, UK, July 2007.
Adaptation and Learning in Agents and in Multiagent Systems (ALAMAS 2007), Maastricht, Netherlands, April 2007.
Learning and Adaptation in Multiagent Systems (at AAMAS 2005), Utrecht, Netherlands, July 2005.
Multiagent Learning (at AAAI 2005), Pittsburgh, PA, July 2005.
Learning Agents (at Autonomous Agents 2001), Montreal, CA, May 2001.
Distributed and Parallel Knowledge Discovery (at KDD-2000), Boston, MA, August 2000.

Tutorials at Conferences:

“Collective Intelligence,” ANNIE 1999 tutorial, St. Louis, MO, November, 1999.
“Classifier Ensemble: How and Why They Work” (w/ Chris Merz), ANNIE 1999 tutorial, St. Louis, MO, November, 1999.

Book Reviewer:

Springer (Machine learning and AI applications)

Journal Reviewer:

Transactions of Autonomous and Adaptive Systems (ACS)
Journal of Aerospace Computing (AIAA)
IEEE Transactions on Computers (IEEE)
Information Fusion (Elsevier)
IEEE Transactions on Pattern Analysis and Machine Learning (IEEE)
IEEE Transactions on Computers (IEEE)
Machine Learning (Kluwer)
IEEE Transactions on Neural Networks (IEEE)
IEEE Transactions on Knowledge and Data Engineering (IEEE)
Pattern Analysis and Applications (Springer)
Pattern Recognition (Elsevier)
International Journal of Pattern Recognition and Artificial Intelligence (World Scientific)
International Journal of Smart Engineering System Design (Gordon and Breach)

Conference Reviewer:

International Conference on Machine Learning
American Association for Artificial Intelligence Conference

International Conference on Pattern Recognition
Genetic and Evolutionary Computation Conference
Autonomous Agents and Multi Agent Systems
International Joint Conference on Neural Networks
Autonomous Agents
Multiple Classifier Systems
Artificial Neural Networks in Engineering
International Conference on Discovery and Data Mining
Australian Conference on Neural Networks

Proposal/Award Referee:

National Science Foundation panel on Computer and Information Science & Engineering (CISE) 2012.
National Science Foundation panel on Computer and Information Science & Engineering (CISE) 2010.
AFOSR reviewer for Mathematics, Information and Life Sciences program, 2009.
National Science Foundation panel on Computer and Information Science & Engineering (CISE) 2008.
National Science Foundation reviewer for Division of Ocean Sciences (OCE), 2008
AFOSR reviewer for Mathematics, Information and Life Sciences program, 2009.
National Science Foundation panel on Computer and Information Science & Engineering (CISE) 2007.
“Director’s Discretionary Funding” proposals. (Select 10 out of 35-50 cross-disciplinary proposals to promote innovative, high risk research). 2000-2005
SBIR and STTR proposals to NASA. 2001,2002, 2005.
“H. Julian Allen award” (Best paper by a NASA Ames scientist). 2000-2005.
“Associate Ames Fellow award” (Recognize body of work by an Ames scientist). 2000-2005.
“RIACS Summer Student Research Program” (Select 10 students a year out of 60-80 applicants for summer research positions in Computational Sciences Division). 2000, 2001, 2002.
“Graduate Student Research Program” (Select 6 students a year out of over 30 applicants to work at NASA Ames Research Center). 2000-2004.
“Best Application Paper,” *ANNIE 1999*, St. Louis, MO, November 1999.
“Best Theoretical Paper,” *ANNIE 1998*, St. Louis, MO, November 1998.

Professional and Honor Society Affiliations:

Senior Member of *The Institute of Electrical and Electronics Engineers*.
Life Member of *American Association of Artificial Intelligence*.
Member of *Eta Kappa Nu Electrical Engineering Honor Society* (1988).
Member of *Alpha Chi National Honor Society* (1987).

Leadership Roles at NASA Ames Research Center (1997-2006):

Group co-lead, “Sensing and Control in Distributed Adaptive Systems,” Intelligent Systems Division, 2005.
Group lead, “Control and Coordination in Adaptive Systems,” Intelligent Systems Division, 2003-2004. (Formed group in 2003).
Group co-lead, “Collectives,” Computational Sciences Division, 2000-2003.

Project co-lead, “Artificial Collectives,” *Intelligent Systems* Program, 2000-2003.
Project lead, “Complex Systems Interaction Discovery,” *Advanced Systems, Concepts and Tools* Program, 2004-2005.
Program element manager, “System Complexity Research,” *Engineering and Complex Systems* Program, 2002-2004. Budget: \$150,000 (2002); \$250,000 (2003) ; \$450,000 (2004).

Program planning: “Airspace Systems” in *Fundamental Aeronautics* Program, 2005.
Research program planning: “Bio-Info-Nano Fusion/Intelligent Matter,” 2004.
NASA Ames/UCLA partnership: “Cell Mimetic Space Exploration” project, UCLA, CA, 2003.

Member, Ames Science and Technology Council, 2004-2006.
Member, Ames Basic Research Council, 2000-2004.
Technical Grant Monitor for four grants to universities (2001-2002).

EDUCATIONAL/ADVISING ACTIVITIES:

Post-Doctoral Researchers Supervised:

Scott Proper, (January 2010 to present).
Matt Knudson, (December 2009 to December 2010).

Doctoral Students Supervised:

Max Salichon, "Learning Based Methods for Micro Aerial Vehicle Control," Mechanical Engineering (Winter 2010).
Matt Knudson, "Navigation and Coordination of Autonomous Mobile Robots with Limited Resources," Mechanical Engineering (Fall 2009).
Atil Iscen, Computer Science (in progress).
Chris Holmes Parker, Mechanical Engineering (in progress).
Mitch Colby, Mechanical Engineering (in progress).
Logan Yliniemi, Mechanical Engineering (in progress).
Carrie Rebhuhn, Mechanical Engineering (in progress).

Masters Students Supervised:

Adam Bell, "Control and Coordination of multiple UAVs", Mechanical Engineering (Fall 2010).
Christian Roth, "Agent Objectives for Evolving Coordinated Sensor Networks", University of Applied Sciences, Offenburg (Summer 2010).
Brett Valenti, "Condensing Observation of Locale and Agents: A State Representation," Mechanical Engineering (Winter 2010).
Jack Shepherd, "A Hierarchical Neuro-Evolutionary Approach to Small Quadrotor control," Mechanical Engineering (Winter 2010).
Jaime Junell, "Adaptive Methods for Robust Commercial Vehicle Control," Mechanical Engineering (Summer 2009).
Niussha Khani, "Learning from Actions Not Taken in Multiagent Systems," Mechanical Engineering (Spring 2009).
Matt Knudson, "Applying Hierarchical and Adaptive Control to Coordinating Simple Robot," Mechanical Engineering (Winter 2008).
Stephen Sills, Mechanical Engineering (in progress).
Ehsan Nasroullahi, Mechanical Engineering (in progress).
Beatrice Moissinac, Computer Science (in progress).
William Curran, Computer Science (in progress).

Honors Thesis (BS) Supervised:

Jaime Junell, Mechanical Engineering (Spring 2008).
Melissa Jensen-Morgan, Mechanical Engineering (Spring 2008).

Undergraduate Research Assistants Supervised:

Carrie Rebhuhn, Mechanical Engineering (Fall 2010–Spring 2011).
Mitch Colby, Mechanical Engineering (Winter–Spring 2010).
Paul Filitchkin, Electrical Engineering and Computer Science (Spring 2009).
Rahul Tewari, Indian Institute of Technology, Kanpur (May–July 2007).
Rajiv Ranjan, Indian Institute of Technology, Kharagpur (May–July 2007).

Visiting Students Supervised:

Daniel Hennes, PhD student, University of Maastricht, Netherlands (Sep–Dec 2007; Mar–Sep 2010).
Christian Roth, MS student at the University of Applied Sciences in Offenburg (March–Sept. 2010).

Doctoral Committees:

Nyree Lemmens, Computer Science, University of Maastricht (2011).
Delvin Peterson, Mechanical Engineering (2011).
Arun Wickramasuriya, Mechanical Engineering (2009).
Ben Dickinson, Mechanical Engineering (2009).
Sasidhar Lingam, Electrical and Computer Engineering (2009).
Adrian Agogino, Electrical and Computer Engineering, The University of Texas at Austin (2003).

Chris Patton, Mechanical Engineering (in progress).
Sarah Oman, Mechanical Engineering (in progress).
Bret Bosma, Electrical and Computer Engineering (in progress).
Christian Hubicki, Mechanical Engineering (in progress).
Jong Bum Ryou, Electrical and Computer Engineering (in progress).
Tao Wang, Electrical and Computer Engineering (in progress).
Daniel Hennes, University of Maastricht, Netherlands.

Masters Committees at Oregon State University:

Devin Koepl, Mechanical Engineering (2011).
Chris Patton, Mechanical Engineering (2009).
Scott Bonnono, Mechanical Engineering (2009).
Cody Ray, Mechanical Engineering (2009).
Mike Chamblin, Mechanical Engineering (2008).
Joel Kolstad, Electrical and Computer Engineering (2007).

Summer Student Supervision (while at NASA Ames Research Center):

Nachi Gupta, Oxford University, 2005.
Angela Pignotti, University of California, Santa Cruz, 2003.
Charley Choe, Oxford University, 2003.
Stephane Airiau, University of Tulsa, 2002, 2004, 2005.
Adrian Agogino, The University of Texas, Austin. 2001, 2002, 2003.
Nikunj Oza, University of California, Berkeley. 1999, 2000.

Teaching Experience:

Oregon State University, Corvallis, OR:

Graduate Courses:

ME 538: Learning Based Control, Fall 2010, 2008
ME 537: Autonomous Agents and Multi Agent Systems: Fall 2011, 2009, Fall 2007.
ME 534: Nonlinear Control: Spring 2007.

Undergraduate Courses:

ME 430: Dynamic Systems and Control: F 2011, F 2010, F 2009, W 2008, F 2007, W 2007.
ECE 451: Dynamic Systems and Control: F 2011, F 2010, F 2009, W 2008, F 2007, W 2007.

The University of Texas, San Antonio, TX:

Electrical Circuits: Fall 96, Spring 97 (Sophomore, required).
Signals and Systems: Fall 96, Spring 97 (Sophomore/Junior, required).
Information Theory and Coding: Fall 96 (Senior, elective).

Neural Networks for Pattern Recognition: Spring 97 (Graduate).

The University of Texas, Austin, TX (Guest Lecturer):

Advanced Topics in Neural Networks: Spring 96 (Graduate; 2 lectures).

Computer Vision: Spring 96 (Senior; 2 lectures).

George Mason University, Fairfax, VA (Tutor):

Mathematics (Calculus) (1986-1987).

French (Basic & Intermediate) (1986-1987).

Curriculum Development:

ME 537: Learning Based Control. Graduate class on learning and control in systems without accurate models. First offered in Fall 2008.

ME 538: Autonomous Agents and Multi-Agent Systems. Graduate class on learning, coordination and control in large distributed systems. First offered in Fall 2007.

ME 514: Mechatronics. Modified topics and increased credits from 3 to 4. First offered in Spring 2008 under new format.

Committee Service:

Faculty Search Committee. School of Mechanical, Industrial and Manufacturing Engineering. Fall 2010-present.

Chair, ME Graduate Program Committee. School of Mechanical, Industrial and Manufacturing Engineering. Sept 2008-Present.

Member, MIME Recruiting Committee, School of Mechanical, Industrial and Manufacturing Engineering. April 2008-Present.

Technical Area Lead, Controls & Dynamics (4 Faculty) in MIME, Fall 2006-present.

Chair, Faculty Search Committee for Robotics. School of Mechanical, Industrial and Manufacturing Engineering. Fall 2007-Spring 2008.

Member, ME Graduate Program Committee. School of Mechanical, Industrial and Manufacturing Engineering. Fall 2006-May 2008

Member, Ad Hoc Joint Committee on Graduate Admissions. Mechanical Engineering and Industrial and Manufacturing Engineering Departments. Winter/Spring 2007.

Broader Education/Outreach Activities:

Local Media Outreach: Interviews with local media on impact of new air traffic management algorithms, March 2010, Corvallis/Eugene, OR. (Video link: <http://kezi.com/page/166752>)

Engineering Week: Visit local schools as part of a NASA program and present space sciences to 4th and 5th graders, March 1998, Sunnyvale, CA.

Discover Engineering: Panelist in a live NTU broadcast to answer questions from high school students interested in engineering, February 1997, Lisle, IL.

INVITED PRESENTATIONS (excluding presentations of papers listed under publications):

Plenary/Invited Talks at Conferences/Workshops:

1. "Coordination in Distributed Autonomous Systems". **Plenary talk** at the *18th Annual Conference on Artificial Neural Networks in Engineering* St. Louis, MO, November 11, 2008.
2. "Learning in Multiagent Systems: Advances and Challenges". **Invited talk** at the *Adaptation and Learning in Agents* workshop at AAMAS 2008, Estoril, Portugal, May 12, 2008.
3. "Evolving Coordinated Multiagent Systems". **Invited talk** at the *Evolutionary Computation and Multi-Agent Systems and Simulation* workshop at GECCO 2007, London, UK, July 7, 2007.

4. “From Ensembles to Collectives: The changing face of MCS”. **Invited talk** on future research directions at the sixth international workshop on *Multiple Classifier Systems*, Monterey, CA, June 2005.

Other Invited Talks and Presentations:

5. Department of Automation and Systems Technology, **Helsinki University of Technology**, “Learning and Coordination in Multiagent Systems,” Helsinki, Finland, September 11, 2009.
6. Creativity and Complex Systems Seminar (CRECOS), **Helsinki University of Technology**, “Coordination in Distributed Complex Systems,” Helsinki, Finland, September 10, 2009.
7. PI Meeting, **Air Force Office of Scientific Research (AFOSR)**, “Coordinating Learning Agents for Active Information Collection,” Arlington, VA, May 28, 2009.
8. Invited talk, **Boeing**, “Air Traffic Flow Management: A Multiagent Approach to Augment Current Operating Procedures,” Bellevue, WA, April 30, 2009.
9. PI Meeting, **Air Force Office of Scientific Research (AFOSR)**, “Coordinating Learning Agents for Active Information Collection,” Arlington, VA, June 4, 2008.
10. Applied Mathematics and Computation Seminar, **Oregon State University**, “Control and Coordination in Distributed Autonomous Systems: A Collectives Approach,” April 18, 2008.
11. Materials Science Seminar, **Oregon State University**, “Optimization and Control in Complex Systems,” April 26, 2007.
12. AI Seminar, School of Electrical Engineering and Computer Science, **Oregon State University**, “Collectives for Multi Agent Learning and Optimization,” April 25, 2007.
13. Mechanical Engineering Seminar, **Oregon State University**, “Collectives: Control and Coordination in Distributed Autonomous Systems,” November 3, 2006.
14. Department of Aerospace Engineering, **University of Maryland**, “Controls and Coordination in Distributed Autonomous Systems,” College Park, MD, May 17, 2006.
15. Aeronautics Directorate, **NASA Ames Research Center**, “Collectives: An Approach to Control and Coordination in Air Transportation Systems,” Moffett Field, CA, April 4, 2006.
16. Computer Science Dept., **University of Southern California**, “Learning and Coordination in Distributed Autonomous Systems,” Los Angeles, CA, March 23, 2006.
17. Computing Science Dept., **University of Alberta**, “Learning and Coordination in Distributed Autonomous Systems,” Edmonton, Alberta, March 17, 2006.
18. Computer Engineering Dept, **University of California, Santa Cruz**, “Control and Coordination in Complex Systems,” Control Seminar, February 28, 2006.
19. Aerospace Engineering Dept., **Stanford University**, “Collectives and System Complexity,” Stanford, CA, April 2005.
20. **Rocketdyne Propulsion and Power**, “Complexity Signatures for System Health Monitoring,” Canoga Park, CA, March 2005.
21. **AAMAS 2004 workshop on challenges in the coordination of large scale multiagent systems**, “Coordination in Large Collectives,” New York, NY, July 2004.
22. Workshop on Collectives and the Design of Complex Systems-2003, **Stanford University**, “Collectives,” Stanford, CA, August 2003.

23. Autonomy and Robotics Area, **NASA Ames Research Center**, “Communication Restrictions in Collective,” June 2003.
24. AI Group Seminar, **Jet Propulsion Laboratory**, “Collectives Everywhere,” Pasadena, CA, April 2003.
25. Robosphere 2002, **NASA Ames Research Center**, “Collectives and Robotic Exploration,” Moffett Field, CA, November 2002.
26. Workshop on Collectives and the Design of Complex Systems-2002, **NASA Ames Research Center**, “Introduction to Collectives,” Moffett Field, CA, August 2002.
27. Collective Cognition – Mathematical Foundations of Distributed Intelligence, **Santa Fe Institute**, “Introduction to Collective Intelligence,” Santa Fe, NM, January 25, 2002.
28. Computer Science Colloquium, **Sonoma State University**, “Collective Intelligence: Design of Large Distributed Systems,” Sonoma, CA, November 15, 2001.
29. AI Seminar, Electrical Engineering and Computer Science Dept., **UC Berkeley**, “Distributed Control and Optimization with Collective Intelligence,” Berkeley, CA, March, 2001.
30. **ICML Workshop on Multi-Agent Learning**, “Collective Intelligence: Designing Reward Functions in Distributed Reinforcement Learning,” Stanford, CA, July, 2000.
31. RIACS Seminar, **NASA Ames Research Center**, “Optimal Reward Functions in Distributed Reinforcement Learning,” Moffett Field, CA, May 11, 2000.
32. Learning Seminar, **Stanford University**, “An Introduction to Collective Intelligence,” Stanford, CA, September 30, 1999.
33. Computational Sciences Division, **NASA Ames Research Center**, “Collective Intelligence: Application to Internet Traffic Routing,” Moffett Field, CA, May 18, 1999.
34. Autonomy Seminar, **NASA Ames Research Center**, “Collective Intelligence: An Introduction,” Moffett Field, CA, May 13, 1999.
35. Laboratory for Artificial Neural Systems, **The University of Texas**, “Collective Intelligence,” Austin, TX, April, 1997.
36. **AAAI Workshop on Integrating Multiple Learning Models**, “Classifier Combining: Analytical Results and implications,” Portland, OR, August 1996.

PUBLICATIONS: (Available from http://enr.oregonstate.edu/~ktumer/publications/class_type.html)

Books:

1. K. Tumer, P. Yolum, L. Sonenberg and P. Stone (editors). *Proceedings of the 10th International Conference on Autonomous Agents and MultiAgent Systems*, International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS), 2011.
2. C. Dagli, K. M. Bryden, M. Gen, S. Corns, G. Suer and K. Tumer (editors). *Intelligent Engineering Systems through Artificial Neural Networks*, Vol. 19, ASME Press, New York, 2009.
3. K. Tumer and D. H. Wolpert (editors). *Collectives and the Design of Complex Systems*. Springer, New York, 2004.

Journal Articles:

4. M. J. Norooz Oliaee, B. Hamdaoui and K. Tumer. Efficient Objective Functions for Coordinated Learning in Large-Scale Distributed OSA Systems *IEEE Transactions on Mobile Computing*. (to appear)

5. Jaime Junell and K. Tumer. Robust Predictive Cruise Control for Commercial Vehicles. *International Journal of General Systems*. (to appear)
6. Max Salichon and K. Tumer. A Neuro-evolutionary Approach to Control Surface Segmentation for Micro Aerial Vehicles. *International Journal of General Systems*. (to appear)
7. A. Agogino and K. Tumer. A Multiagent Approach to Managing Air Traffic Flow. *Journal of Autonomous Agents and Multiagent Systems*, 24:1-25, 2012 (DOI: 10.1007/s10458-010-9142-5).
8. M. Knudson and K. Tumer. Adaptive Navigation for Autonomous Robots. *Robotics and Autonomous Systems* 59:410–420, 2011.
9. A. Agogino and K. Tumer. A Multiagent Coordination Approach to Robust Consensus Clustering. *Advances in Complex Systems*, 13:165–197, 2010.
10. A. Agogino and K. Tumer. Learning Indirect Actions in Complex Domains: Action Suggestions for Air Traffic Control. *Advances in Complex Systems*, 12:493–512, 2009.
11. K. Tumer and N. Khani. Learning from Actions Not Taken in Multiagent Systems. *Advances in Complex Systems*, 12:455–473, 2009.
12. K. Tumer and A. Agogino. Multiagent Learning for Black Box System Reward Functions. *Advances in Complex Systems*, 12:475–492, 2009.
13. K. Tumer and A. Agogino. Ensemble Clustering with Voting Active Clusters. *Pattern Recognition Letters*, 29(14):1947–1953, 2008.
14. A. Agogino and K. Tumer. Efficient Evaluation Functions for Evolving Coordination. *Evolutionary Computation*, 16(2):257–288, 2008.
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32. J. Ghosh and K. Tumer. Structural adaptation and generalization in supervised feedforward networks. *Journal of Artificial Neural Networks*, 1(4):431–458, 1994.

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33. L. Sonenberg, P. Stone, K. Tumer and P. Yolum. Introduction to the AI Magazine AAMAS 2011 Special Issue. *AI Magazine*, 2012. (to appear)
34. K. Tumer and M. Knudson. Aligning Agent Objectives for Learning and Coordination in Multiagent Systems. *PerAda Magazine*, (DOI: 10.2417/2201010.003362), Oct, 2010.
35. K. Tumer and A. Agogino. Improving Air Traffic Management with a Learning Multiagent System. *IEEE Intelligent Systems*, 24(1):18-21, 2009.

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36. K. Tuyls and K. Tumer. Multiagent Learning. In G. Weiss, editor, *Multiagent Systems*, Springer, 2012. (to appear)
37. K. Tumer and J. Lawson. Coordinating Learning Agents for Multiple Resource Job Scheduling. In M. Taylor and K. Tuyls, editors, *Adaptive and Learning Agents*, Springer, 2010.
38. K. Tumer, A. Agogino and Z. Welch. Traffic Congestion Management as a Learning Agent Coordination Problem. In A. Bazzan and F. Kluegl, editors, *Multiagent Architectures for Traffic and Transportation Engineering*, 2009.
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44. D. H. Wolpert and K. Tumer. Optimal payoff functions for members of collectives. In F. Schweitzer, editor, *Modeling Complexity in Economic and Social Systems*, chapter 20, pages 355–369. World Scientific, 2002.
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Highly Refereed Conferences (Acceptance rate below 50%):

48. M. Colby and K. Tumer. Shaping Fitness Functions for Coevolving Cooperative Multiagent Systems. In *Proceedings of the Eleventh International Joint Conference on Autonomous Agents and Multiagent Systems*. Valencia, Spain, June 2012. (20% acceptance)
49. S. Proper and K. Tumer. Modeling Difference Rewards for Multiagent Learning (Extended Abstract). In *Proceedings of the Eleventh International Joint Conference on Autonomous Agents and Multiagent Systems*. Valencia, Spain, June 2012. (43% acceptance)
50. M. Colby, E. Nasroullahi and K. Tumer. Optimizing Ballast Design of Wave Energy Converters Using Evolutionary Algorithms In *Proceedings of the Genetic and Evolutionary Computation Conference*. pages 1739-1746, Dublin, Ireland, July 2011. (45% acceptance)
51. C. Roth, M. Knudson and K. Tumer. Agent Fitness Functions for Evolving Coordinated Sensor Networks In *Proceedings of the Genetic and Evolutionary Computation Conference*. Dublin, Ireland, July 2011. (45% acceptance)
52. M. Salichon and K. Tumer. A Neuro-Evolutionary Approach to Micro Aerial Vehicle Control. In *Proceedings of the Genetic and Evolutionary Computation Conference*, pages 1123-1130. Portland, OR, July 2010. Nominated for best paper award in Real World Applications. (45% acceptance)
53. M. Knudson and K. Tumer. Coevolution of Heterogeneous Multi-Robot Teams. In *Proceedings of the Genetic and Evolutionary Computation Conference*, pages 127-134. Portland, OR, July 2010. (45% acceptance)
54. J. Shepherd III and K. Tumer. Robust Neuro-Control for A Micro Quadrotor. In *Proceedings of the Genetic and Evolutionary Computation Conference*, pages 1131-1138. Portland, OR, July 2010. Nominated for best paper award in Real World Applications. (45% acceptance)

55. M. Knudson and K. Tumer. Robot Coordination with Ad-hoc Team Formation (extended abstract). In *Proceedings of the Ninth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1441-1442. Toronto, CA, May 2010. (43% acceptance)
56. N. Khani and K. Tumer. Learning from Actions Not Taken: A Multiagent Learning Algorithm (extended abstract). In *Proceedings of the Eighth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1277-1278. Budapest, Hungary, May 2009. (41% acceptance)
57. A. Agogino and K. Tumer. Improving Air Traffic Management through Agent Suggestions (extended abstract). In *Proceedings of the Eighth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1271-1272. Budapest, Hungary, May 2009. (41% acceptance)
58. K. Tumer and A. Agogino. Adaptive Management of Air Traffic Flow: A Multiagent Coordination Approach. In *Proceedings of the Twenty Third AAI Conference on Artificial Intelligence, Nectar Track*. Chicago, IL, July 2008. (21% acceptance)
59. A. Agogino and K. Tumer. Regulating Air Traffic Flow with Coupled Agents. In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*. Estoril, Portugal, May 2008. (22% acceptance)
60. K. Tumer, Z. Welch and A. Agogino. Aligning social welfare and agent preferences to alleviate traffic congestion. In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*. Estoril, Portugal, May 2008. (22% acceptance)
61. A. Agogino and K. Tumer. Evolving Distributed Agents for Managing Air Traffic. In *The Genetic and Evolutionary Computation Conference*, London, UK, July 2007. (46% acceptance)
62. K. Tumer and A. Agogino. Distributed Agent-Based Air Traffic Flow Management. **Best Paper Award** (out of 531 submissions). In *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 330-337. Honolulu, HI, May 2007. (22% acceptance)
63. A. Agogino and K. Tumer. QUICR-Learning for Multiagent Coordination. In *Proceedings of the Twenty First National Conference on Artificial Intelligence*, Boston, MA, July 2006. (21% oral presentation)
64. A. Agogino and K. Tumer. Distributed Evaluation Functions for Fault Tolerant Multi-Rover Systems. In *The Genetic and Evolutionary Computation Conference*, Seattle, WA, July 2006. (46% acceptance)
65. A. Agogino and K. Tumer. Efficient agent-based cluster ensembles. In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems*, Hakodate, Japan, May 2006. (22% acceptance)
66. K. Tumer. Coordinating simple and unreliable agents (short paper). In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems*, Hakodate, Japan, May 2006.
67. N. Gupta, A. Agogino and K. Tumer. Efficient Agent-Based Models for Non-Genomic Evolution. In *Proceedings of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems*, Hakodate, Japan, May 2006. (22% acceptance; 10% oral presentation)
68. A. Agogino and K. Tumer. Multi agent reward analysis for learning in noisy domains. In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems*, Utrecht, Netherlands, July 2005. (25% acceptance)
69. K. Tumer and A. Agogino. Coordinating multi-rover systems: Evaluation functions for dynamic and noisy environments. In *The Genetic and Evolutionary Computation Conference*, Washington, DC, June 2005. (46% acceptance)
70. A. Agogino, K. Tumer, and R. Miikkulainen. Efficient credit assignment through evaluation function decomposition. In *The Genetic and Evolutionary Computation Conference*, Washington, DC, June 2005. (46% acceptance)

71. A. Agogino and K. Tumer. Unifying temporal and structural credit assignment problems. In *Proceedings of the Third International Joint Conference on Autonomous Agents and Multiagent Systems*, New York, NY, July 2004. (25% acceptance)
72. K. Tumer and A. Agogino. Time-extended policies in multiagent reinforcement learning. In *Proceedings of the Third International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1336–1337, New York, NY, July 2004. (25% acceptance)
73. A. Agogino and K. Tumer. Efficient evaluation functions for multi-rover systems. In *The Genetic and Evolutionary Computation Conference*, pages 1–12, Seattle, WA, June 2004. (50% acceptance)
74. K. Tumer and J. Lawson. Collectives for multiple resource job scheduling across heterogeneous servers (short paper). In *Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems*, Melbourne, Australia, July 2003.
75. A. Agogino and K. Tumer. Team formation and communication restrictions in collectives (short paper). In *Proceedings of the Second International Joint Conference on Autonomous Agents and Multiagent Systems*, Melbourne, Australia, July 2003.
76. K. Tumer, A. Agogino, and D. H. Wolpert. Learning sequences of actions in collectives of autonomous agents. In *Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 378–385, Bologna, Italy, July 2002. (26% acceptance)
77. D. H. Wolpert, J. Sill, and K. Tumer. Reinforcement learning in distributed domains: Beyond team games. In *Proceedings of the Seventeenth International Joint Conference on Artificial Intelligence*, pages 819–824, Seattle, WA, 2001. (25% acceptance)
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80. D. H. Wolpert, K. Wheeler, and K. Tumer. General principles of learning-based multiagent systems. In *Proceedings of the Third International Conference of Autonomous Agents*, pages 77–83, May 1999.
81. D. H. Wolpert, K. Tumer, and J. Frank. Using collective intelligence to route internet traffic. In M. Kearns, S. A. Solla, and D. Cohn, editors, *Advances in Neural Information Processing Systems - 11*, pages 952–958. MIT Press, 1999.
82. K. Tumer, N. Ramanujam, R. Richards-Kortum, and J. Ghosh. Spectroscopic detection of cervical pre-cancer through radial basis function networks. In M. C. Mozer, M. I. Jordan, and T. Petsche, editors, *Advances in Neural Information Processing Systems - 9*, pages 981–987. MIT Press, 1997.
83. K. Tumer and J. Ghosh. Estimating the Bayes error rate through classifier combining. In *Proceedings of the Thirteenth International Conference on Pattern Recognition*, pages IV:695–99, Vienna, Austria, August 1996.

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84. B. Hamdaoui , M. J. Norooz Oliiae and K. Tumer. Aligning Spectrum-User Objectives for Maximum Inelastic-Traffic Reward. In *The Proceedings of the 2011 International Conference on Computer Communication Networks (ICCCN)*. Maui, Hawaii, July 31-Aug 4, 2011.
85. M. J. Norooz Oliiae, B. Hamdaoui and K. Tumer. Achieving Optimal Elastic Traffic Rewards in Dynamic Multichannel Access. In *Proc of IEEE International Conference on High Performance Computing and Simulation Conference (HPCS 2011)*. Istanbul, Turkey, July 4-8, 2011.

86. M. Knudson and K. Tumer. Towards Coordinating Autonomous Robots for Exploration in Dynamic Environments. In *Intelligent Engineering Systems through Artificial Neural Networks*, Vol 18, pp. 587-594, ASME Press, St. Louis, MO, November 2008.
87. M. Knudson and K. Tumer. Neuro-Evolutionary Navigation for Resource-Limited Mobile Robots. In *Intelligent Engineering Systems through Artificial Neural Networks*, Vol 18, pp. 27-34, ASME Press, St. Louis, MO, November 2008. **2nd runner up for best application paper award.**
88. N. Khani and K. Tumer. Fast Multiagent Learning: Cashing in on Team Knowledge. In *Intelligent Engineering Systems through Artificial Neural Networks*, Vol 18, pp 3–10, ASME Press, St. Louis, MO, November 2008. **1st runner up for best theoretical development paper award.**
89. J. Junell, M. Knudson and K. Tumer. Optimization of Sensor/Neuro-Controller Pairings for Effective Navigation. In *Intelligent Engineering Systems through Artificial Neural Networks*, Vol 18, pp. 19-26, ASME Press, St. Louis, MO, November 2008.
90. M. Salichon and K. Tumer. A Neuro-evolutionary Approach to Micro Aerial Vehicle Control. In *Intelligent Engineered Systems through Artificial Neural Networks*, Vol 18, pp. 11-18, ASME Press, St. Louis, MO, November 2008.
91. A. Agogino and K. Tumer. Entropy Based Anomaly Detection Applied to Space Shuttle Main Engines. In *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2006.
92. K. Tumer and A. Agogino. Robust Coordination of a Large Set of Simple Rovers. In *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2006.
93. K. Tumer and A. Agogino. Complexity signatures for system health monitoring. In *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2005.
94. K. Tumer and A. Agogino. Overcoming communication restrictions in collectives. In *Proceedings of the International Joint Conference on Neural Networks*, Budapest, Hungary, July 2004.
95. K. Tumer and D. H. Wolpert. Coordination in large collectives. In Y. Bar-Yam, editor, *Fifth International Conference on Complex Systems - 2004*.
96. N. C. Oza, I. Y. Tumer, K. Tumer, and E. Huff. Classification of aircraft maneuvers for fault detection. In J. Kittler and F. Roli, editors, *Proceedings of the Fourth International Workshop on Multiple Classifier Systems*, pages 375–384, Surrey, UK, June 2003. Springer.
97. D. H. Wolpert and K. Tumer. Optimal reward functions in distributed reinforcement learning. In *Proceedings of the Second Asia-Pacific Conference on Intelligent Agent Technology (IAT-2001)*, Maebashi City, Japan, October 2001.
98. N. C. Oza and K. Tumer. Input decimated ensembles: Decorrelation through dimensionality reduction. In J. Kittler and F. Roli, editors, *Proceedings of the Second International Workshop on Multiple Classifier Systems*, pages 238–249. Springer, Cambridge, UK, June 2001.
99. K. Tumer and N. C. Oza. Decimated input ensembles for improved generalization. In *Proceedings of the International Joint Conference on Neural Networks*, Washington, D.C., July 1999.
100. K. Tumer, K. D. Bollacker, and J. Ghosh. A mutual information based ensemble method to estimate the Bayes error. In C. Dagli et al., editor, *Intelligent Engineering Systems through Artificial Neural Networks*, volume 8, pages 17–22. ASME Press, St. Louis, MO, November 1998.
101. K. Tumer and J. Ghosh. Classifier combining through trimmed means and order statistics. In *Proceedings of the International Joint Conference on Neural Networks*, pages 757–762, Anchorage, AL, June 1998.

102. K. Tumer and J. Ghosh. Limits to performance gains in combined neural classifiers. In *Intelligent Engineering Systems through Artificial Neural Networks*, volume 7, pages 419–424, St. Louis, MO, November 1995.
103. K. Tumer and J. Ghosh. Order statistics combiners for neural classifiers. In *Proceedings of the World Congress on Neural Networks*, pages I:31–34, Washington D.C., July 1995. INNS Press.
104. K. Tumer and J. Ghosh. Boundary variance reduction for improved classification through hybrid networks (Invited paper). In *Applications and Science of Artificial Neural Networks, Proceedings of the SPIE (Vol. 2492)*, pages 573–584, April 1995.
105. K. Tumer and J. Ghosh. A framework for estimating performance improvements in hybrid pattern classifiers. In *Proceedings of the World Congress on Neural Networks*, pages III:220–225, San Diego, June 1994. INNS Press.
106. K. Tumer and J. Ghosh. Sequence recognition by input anticipation. In *Proceedings of the Seventh International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems*, Austin, TX, June 1994.
107. J. Ghosh, K. Tumer, S. Beck, and L. Deuser. Integration of local and global neural classifiers for passive sonar signals. In *Proceedings of the International Simulation Technology Conference*, pages 539–545, Houston, TX, November 1992.
108. J. N. Amaral, J. Ghosh, and K. Tumer. Applying genetic algorithms to the state assignment problem: A case study. In *Adaptive and Learning Systems, Proceedings of the SPIE (Vol. 1706)*, pages 2–13, Orlando, FL, April 1992.
109. K. Tumer, D. Torres, and R. Chemali. A new algorithm for automatic shoulder bed correction. In *Transactions of the Society of Professional Well Log Analysts' 32nd Annual Logging Symposium (SPWLA)*, Midland, TX, June 1991.

Workshop/Symposia:

110. A. Iscen, C. Holmes Parker and K. Tumer. Decreasing Communication Requirements for Agent Specific Rewards in Multiagent Learning. In *AAMAS-11 workshop on Adaptive and Learning Agents*, Taipei, Taiwan, May 2011.
111. M. Knudson and K. Tumer. Policy Search and Policy Gradient Methods for Autonomous Navigation. In *AAMAS-10 workshop on Adaptive and Learning Agents*, Toronto, Canada, May 2010.
112. K. Tumer and J. Lawson. Multiagent Coordination for Multi Resource Job Scheduling. In *AAMAS-09 workshop on Adaptive and Learning Agents*, Budapest, Hungary, May 2009.
113. D. Hennes, K. Tumer and K. Tuyls. A multiagent approach to hyper-redundant manipulators. In *AAMAS-08 Workshop on Learning and Adaptive Agents*. Estoril, Portugal, May 2008.
114. M. Knudson and K. Tumer. Effective Policies for Resource Limited Agents. In *AAMAS-07 Workshop on Learning and Adaptive Agents*. Honolulu, HI, May 2007.
115. K. Tumer, and A. Agogino. Agent Reward Shaping for Alleviating Traffic Congestion (**Invited Paper**). In *AAMAS-06 Workshop on Agents in Transportation and Traffic*. Hakodate, Japan, May 2006.
116. S. Airiau, K. Tumer, and A. Agogino. Learning agents for distributed and robust spacecraft power management. In *AAMAS-06 Workshop on Adaptation and Learning in Autonomous Agents and Multiagent Systems*. Hakodate, Japan, May 2006.
117. K. Tumer and A. Agogino. Efficient Reward Functions for Adaptive Multi-Rover Systems. In *AAMAS-05 Workshop on Coordination in Large Scale Multiagent Systems*. Utrecht, Netherlands, July 2005.

118. A. Agogino and K. Tumer. Multiagent Reward Analysis for Learning in Noisy Domains. In *AAMAS-05 Workshop on Learning and Adaptation in Multiagent Systems*. Utrecht, Netherlands, July 2005.
119. K. Tumer. Coordination in large multiagent systems. In *AAMAS-04 Workshop on Challenges in the Coordination of Large Scale Multiagent Systems*. New York, NY, July 2004.
120. S. Airau, S. Sen, D. H. Wolpert, and K. Tumer. Providing effective access to shared resources: A COIN approach. In *AAMAS-03 Workshop on Engineering Self-Organizing Systems*. Melbourne, Australia, July 2003.
121. D. H. Wolpert and K. Tumer. Beyond mechanism design. In *ICM Game Theory Conference, "Heterogeneous and Social Games" Special Session*. Qingdao, China, August 2002.
122. D. H. Wolpert and K. Tumer. Overview of design of collectives. In *Robosphere 2002: Self Sustaining Robotic Ecologies*, pages 11–16, Moffett Field, CA., November 2002.
123. J. Ghosh and K. Tumer. Ensemble techniques for data mining in heterogeneous environments. In *Institute for Operations Research and the Management Sciences Conferences*, San Antonio, TX, November 2000.
124. D. H. Wolpert and K. Tumer. Reinforcement learning in distributed domains: An inverse game theoretic approach. In *2001 AAAI Spring Symposium on Game Theoretic and Decision Theoretic Agents*, Stanford, CA, March 2001.
125. D. H. Wolpert and K. Tumer. Illustration of the COIN approach to the design of multiagent systems. In *AGENTS-00/ECML-00 Workshop on Learning Agents*, Barcelona, Spain, June 2000.
126. K. Tumer and D. H. Wolpert. Designing reward functions for multiagent systems: A collective intelligence approach. In *ICML-2000 Workshop on Multiagent Learning: Theory and Practice*, Stanford, CA, July 2000.
127. D. H. Wolpert and K. Tumer. Collective intelligence. In *Fourth Workshop on Economics with Heterogeneous Interacting Agents*, Genoa, Italy, June 1999.
128. D. H. Wolpert and K. Tumer. Collective intelligence for optimization. In *IJCAI-99 Workshop on Statistical Machine Learning for Large Scale Optimization*, Stockholm, Sweden, July 1999.
129. D. H. Wolpert, K. Tumer, and A. M. Bell. Collective intelligence for network routing. In *AAAI-99 Workshop*, Orlando, FL, July 1999.
130. A. M. Bell, W. Sethares, D. Lucking-Reiley, D. H. Wolpert, K. Tumer, and J. Frank. Strategic behavior, learning and the efficient allocation of network resources. In *International Congress on Networks, Groups and Coalitions*, Manresa, Spain, May 1999.
131. K. Tumer and J. Ghosh. Classifier combining: Analytical results and implications. In *Integrating Multiple Learned Models for Improving and Scaling Machine Learning Algorithms, workshop at the Thirteenth National Conference on Artificial Intelligence*, Portland, OR, August 1996.

Thesis/Dissertation:

132. K. Tumer. *Linear and Order Statistics Combiners for Reliable Pattern Classification*. PhD Dissertation, The University of Texas, Austin, TX, May 1996.
133. K. Tumer. *Structural adaptation and generalization in neural networks*. Master's Thesis, The University of Texas, Austin, TX, August 1992.