

Xiaobo Tan

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Professional Preparation

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| Tsinghua University, China | Automatic Control | B.E., 1995 |
| Tsinghua University, China | Automatic Control | M.E., 1998 |
| University of Maryland at College Park | Electrical Engineering | Ph.D., 2002 |
| University of Maryland at College Park | Controls | Postdoc, 2002-2004 |

Appointments

- 2004 - Assistant Professor, Department of Electrical & Computer Engineering, MSU
- 2002 - 2004 Research Associate, Institute for Systems Research, University of Maryland, College Park
- 1998 - 2002 Research Assistant, Department of Electrical & Computer Engineering, University of Maryland, College Park

HONORS AND AWARDS

1. Faculty Early Career Development Award (CAREER), the National Science Foundation, 2006
2. Educational Grant in Optical Science and Engineering, International Society for Optical Engineering (SPIE), 2005
3. Best Poster Award (with M. Khbeis), the MEMS Alliance Special Topics Symposium, April 2003
4. Finalist, Best Student Paper Award, the 41st IEEE Conference on Decision and Control, 2002
5. Systems Fellow, Institute for Systems Research, University of Maryland, January 1998 - August 2002
6. Graduate and Undergraduate Scholarships, Tsinghua University: Siemens Prize (1997), Outstanding Automation Graduate Prize (1995), Yu-Chi Ho Scholarship (1994), 12.9 Scholarship (1991 & 1992)
7. First Class Prize, National Intelligence Contest for High School Students, China, 1988

TEACHING

1. EGR 100 (Member of instructional team), *Introduction to Engineering Design* (Fall 2007, Spring 2008, Fall 2008), MSU
2. ECE 313, *Control Systems* (Fall 2004, Fall 2005, Fall 2006, Fall 2007), MSU
3. ECE 480 (Facilitator), *Senior Design* (Fall 2005, Spring 2006), MSU
4. ECE 802-602, *Smart Material Sensors and Actuators* (Spring 2008), MSU
5. ECE 802-603, *Smart Sensors and Actuators in Micro and Nanosystems* (Spring 2005), MSU
6. ECE 802-603, *Networked and Embedded Control Systems* (Spring 2007), MSU
7. ECE 856, *Adaptive Control* (Fall 2008), MSU
8. ECE 960A, *Adaptive Control* (Spring 2006), MSU

RESEARCH AND EDUCATIONAL GRANTS

1. PI, “Nonlinear and Adaptive Control of Smart Material-Actuated Systems with Application to Nanopositioning,” National Science Foundation, \$210,000, 08/15/2008 - 08/14/2011. (Co-PI: H. K. Khalil. X. Tan’s share: \$126,000)
2. Co-PI, “Development of An Autonomous Robotic Fish-based Sensor to Detect Harmful Algal Blooms (HABs),” Biogeochemistry Environmental Research Initiative (BERI) at MSU, \$10,000, Spring 2009. (PI: E. Litchman)
3. Co-PI, “ORCHID: Harnessing Digital Evolution to Design High-Assurance Adaptive Systems,” National Science Foundation, \$600,000, 07/01/2008 - 06/30/2011. (PI: B. H. Cheng; Other Co-PIs: P. K. McKenley, C. A. Ofria. X. Tan’s share: \$150,000)
4. PI, “Highly Maneuverable Robotic Fish Based on Biological Principles and Biomimetic Materials,” Office of Naval Research, \$379,748, 06/01/2008 - 05/31/2011
5. Co-PI, “CRI: IAD - A Testbed for Evolving Adaptive and Cooperative Behavior Among Autonomous Systems,” National Science Foundation, \$188,110, 05/01/2008 - 04/30/2009. (PI: P. K. McKinley; Other Co-PIs: B. H. Cheng, C. A. Ofria, R. T. Pennock. X. Tan’s share: \$35,741)
6. PI, “Modeling and Control of Self-sensing Artificial Muscles,” US Civilian Research & Development Foundation, \$9,400, 01/01/2008 - 12/31/2009
7. PI, “CAREER: Dexterous Biomimetic Micromanipulation Using Artificial Muscles: Modeling, Sensing, and Control,” National Science Foundation, \$503,934, 03/01/2006 - 02/28/2011
8. PI, “Integrated Sensory Feedback for Artificial Muscles,” Michigan State University Intramural Research Grants Program, \$50,000, 12/15/2005 - 12/31/2007

9. PI, "SGER: A Control-Oriented Model for Ionic Polymer-Metal Composite Actuators," National Science Foundation, \$27,084, 09/15/2005 - 05/31/2006
10. PI, Educational Grant in Optical Science and Engineering, The International Society for Optical Engineering, \$2,000, 08/29/2005 - 08/28/2006

PUBLICATIONS

Journal Papers:

1. S. Shatara, **X. Tan**, "Sliding-window Discrete Fourier Transform (SDFT)-based Underwater Acoustic Ranging for Small Robotic Fish," submitted to *IEEE Journal of Oceanic Engineering*, 2009
2. Z. Chen, D. R. Hedgepeth, **X. Tan**, "A Nonlinear, Control-oriented Model for Ionic Polymer-Metal Composite Actuators," submitted to *Smart Materials and Structures*, 2008
3. Z. Chen, S. Shatara, **X. Tan**, "Modeling of Biomimetic Robotic Fish Propelled by an Ionic Polymer-Metal Composite Caudal Fin," submitted to *IEEE Transactions on Robotics*, 2008
4. J. Ahrens, **X. Tan**, H. K. Khalil, "Multirate Sampled-Data Output Feedback Control with Application to Smart Material Actuated Systems," *IEEE Transactions on Automatic Control*, to appear, 2008
5. **X. Tan**, R. Iyer, "Modeling and Control of Hysteresis: Introduction to the Special Section," *IEEE Control Systems Magazine*, to appear, 2008
6. R. Iyer, **X. Tan**, "Control of Hysteretic Systems through Inverse Compensation: Inversion Algorithms, Adaptation, and Embedded Implementation" (**Invited paper** for special issue on Hysteresis), *IEEE Control Systems Magazine*, to appear, 2008
7. Y. Fang, T. J. Pence, **X. Tan**, "Nonlinear Elastic Modeling of Differential Expansion in Trilayer Conjugated Polymer Actuators," *Smart Materials and Structures*, Vol. 17, 065020 (10 pp), 2008
8. Z. Chen, **X. Tan**, "A Control-oriented and Physics-based Model for Ionic Polymer-Metal Composite Actuators," *IEEE/ASME Transactions on Mechatronics*, Vol. 13, No. 5, pp. 519-529, 2008
9. Y. Fang, **X. Tan**, G. Alici, "Robust Adaptive Control of Conjugated Polymer Actuators," *IEEE Transactions on Control Systems Technology*, Vol. 16 No. 4, pp. 600-612, 2008
10. Y. Fang, **X. Tan**, G. Alici, "Redox Level-Dependent Impedance Model for Conjugated Polymer Actuators," *Sensors and Actuators B: Chemical*, Vol. 132, pp. 182-190, 2008

11. Z. Chen, K. Kwon, **X. Tan**, "Integrated IPMC/PVDF Sensory Actuator and Its Validation in Feedback Control," *Sensors and Actuators A: Physical*, Vol. 144, No. 2, pp. 231-241, 2008
12. Y. Fang, **X. Tan**, Y. Shen, N. Xi, G. Alici, "A Scalable Model for Trilayer Conjugated Polymer Actuators and Its Experimental Validation," *Materials Science and Engineering C: Biomimetic and Supramolecular Systems*, Vol. 28, No. 3, pp. 421-428, 2008
13. Z. Chen, **X. Tan**, A. Will, C. Ziel, "A Dynamic Model for Ionic Polymer-Metal Composite Sensors," *Smart Materials and Structures*, Vol. 16, pp. 1477-1488, 2007
14. Z. Chen, Y. Shen, N. Xi, **X. Tan**, "Integrated Sensing for Ionic Polymer-Metal Composite Actuators Using PVDF Thin Films" (**Invited paper** for special issue on Electroactive Polymer Materials), *Smart Materials and Structures*, Vol. 16, No. 2, pp. S262-S271, 2007
15. W. Xi, **X. Tan**, J. S. Baras, "Gibbs Sampler-based Coordination of Autonomous Swarms," *Automatica*, Vol. 42, No. 7, pp. 1107-1119, 2006
16. **X. Tan**, A. Modafe, R. Ghodssi, "Measurement and Modeling of Dynamic Rolling Friction in Linear Microball Bearings," *Journal of Dynamic Systems, Measurement and Control*, Vol. 128, No. 4, pp. 891-898, 2006
17. **X. Tan**, "Almost Symplectic Runge-Kutta Schemes for Hamiltonian Systems," *Journal of Computational Physics*, Vol. 203, No. 1, pp. 250-273, 2005
18. **X. Tan**, J. S. Baras, P. S. Krishnaprasad, "Control of Hysteresis in Smart Actuators with Application to Micropositioning," *Systems and Control Letters*, Vol. 54, No. 5, pp. 483-492, 2005
19. R. V. Iyer, **X. Tan**, P. S. Krishnaprasad, "Approximate Inversion of the Preisach Hysteresis Operator with Application to Control of Smart Actuators," *IEEE Transactions on Automatic Control*, Vol. 50, No. 6, pp. 798-810, 2005
20. **X. Tan**, J. S. Baras, "Adaptive Identification and Control of Hysteresis in Smart Materials," *IEEE Transactions on Automatic Control*, Vol. 50, No. 6, pp. 827-839, 2005
21. **X. Tan**, J. S. Baras, "Modeling and Control of Hysteresis in Magnetostrictive Actuators," *Automatica*, Vol. 40, No. 9, pp. 1469-1480, 2004
22. P. S. Krishnaprasad, **X. Tan**, "Cayley Transforms in Micromagnetics," *Physica B*, Vol. 306, pp. 195-199, 2001
23. **X. Tan**, N. Zhang, L. Tong, Z. Wang, "Fuzzy Control of Thyristor Controlled Series Compensator in Power System Transients," *Fuzzy Sets and Systems*, Vol. 110, No. 3, pp. 429-436, 2000
24. **X. Tan**, L. Tong, N. Zhang, Z. Wang, "Study on Multi-Objective Control of Thyristor Controlled Series Compensation," *Journal of Tsinghua University (Sci & Tech)* (in Chinese), Vol. 37, No. 7, pp. 63-66, 1997

25. N. Zhang, B. Huang, **X. Tan**, “Development of Fuzzy Systems Development Tool FSdT 1.0,” *Microcomputers and Its Applications* (in Chinese), No.3, pp. 27-28, 1996

Conference Papers:

1. **X. Tan**, H. K. Khalil, “Two-Time-Scale Averaging of Systems Involving Operators and Its Application to Adaptive Control of Hysteretic Systems,” submitted for presentation at the 2009 American Control Conference, St. Louis, MO, 2009
2. S. Shatara, S. Henneberger, J. Thon, **X. Tan**, “Sliding Window DFT-based Acoustic Detection for Underwater Fine-Grained Ranging,” submitted for presentation at *the IEEE International Conference on Robotics and Automation*, Kobe, Japan, 2009
3. Q. Hu, D. R. Hedgepeth, L. Xu, **X. Tan**, “A Framework for Modeling Steady Turning of Robotic Fish,” submitted for presentation at *the IEEE International Conference on Robotics and Automation*, Kobe, Japan, 2009
4. Y. Fang, T. Pence, **X. Tan**, “A Large Deformation Nonlinear Model for Conjugated Polymer Actuators,” accepted for presentation at *the 16th SPIE International Symposium on Smart Structures and Materials: Electroactive Polymer Actuators and Devices (EAPAD) XI*, 2009
5. Z. Chen, S. Shatara, **X. Tan**, “Modeling of Robotic Fish Propelled by an Ionic Polymer-Metal Composite Caudal Fin,” accepted for presentation at *the 16th SPIE International Symposium on Smart Structures and Materials: Electroactive Polymer Actuators and Devices (EAPAD) XI*, 2009
6. Z. Chen, D. Hedgepeth, **X. Tan**, “Nonlinear Capacitance of Ionic Polymer-Metal Composites,” accepted for presentation at *the 16th SPIE International Symposium on Smart Structures and Materials: Electroactive Polymer Actuators and Devices (EAPAD) XI*, 2009
7. Z. Chen, D. Hedgepeth, **X. Tan**, “A Nonlinear Control-oriented Model for Ionic Polymer-Metal Composite Actuators,” accepted for presentation at *the 47th IEEE Conference on Decision and Control*, Cancun, Mexico, 2008
8. Y. Fang, **X. Tan**, “Design and Modeling of a Petal-Shape, Conjugated Polymer-Actuated Micropump,” (**Invited**), (**Best Session Presentation Award**), *Proceedings of the 2008 ASME Dynamic Systems and Control Conference*, Ann Arbor, MI, Paper DSCC2008-2278, 2008
9. **X. Tan**, “Swarming Control Using Parallel Gibbs Sampling,” *Proceedings of the 2008 American Control Conference*, Seattle, WA, pp. 3701-3706, 2008
10. **X. Tan**, O. Bennani, “Fast Inverse Compensation of Preisach-Type Hysteresis Operators Using Field-Programmable Gate Arrays,” *Proceedings of the 2008 American Control Conference*, Seattle, WA, pp. 2365-2370, 2008

11. E. Mbemmo, Z. Chen, S. Shatarra, **X. Tan**, “Modeling of Biomimetic Robotic Fish Propelled by An Ionic Polymer-Metal Composite Actuator,” *Proceedings of the 2008 IEEE International Conference on Robotics and Automation*, Pasadena, CA, pp. 689-694, 2008
12. S. Shatarra, **X. Tan**, E. Mbemmo, N. Gingery, “Experimental Investigation on Underwater Acoustic Ranging for Small Robotic Fish,” *Proceedings of the 2008 IEEE International Conference on Robotics and Automation*, Pasadena, CA, pp. 712-717, 2008
13. Z. Chen, **X. Tan**, “A Scalable Dynamic Model for Ionic Polymer-Metal Composite Actuators,” Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) X, Proceedings of the SPIE*, Vol. 6927, pp. 69270I, 2008
14. Z. Chen, K. Kwon, **X. Tan**, “Design of Integrated IPMC/PVDF Sensory Actuator and Its Application to Feedback Control,” (**Invited**), M. Tomizuka, editor, *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, Proceedings of the SPIE*, Vol. 6932, pp. 69321O, 2008
15. Y. Fang, **X. Tan**, G. Alici, “Redox Level-Dependent Impedance Model for Conjugated Polymer Actuators,” Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) X, Proceedings of the SPIE*, Vol. 6927, pp. 69270Z, 2008
16. Y. Fang, **X. Tan**, A. Temme, G. Alici, “Characterization and Modeling of Conjugated Polymer Sensors,” Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) X, Proceedings of the SPIE*, Vol. 6927, pp. 692709, 2008
17. Z. Chen, **X. Tan**, “A Control-oriented, Physics-based Model for Ionic Polymer-Metal Composite Actuators,” *Proceedings of the 46th IEEE Conference on Decision and Control*, New Orleans, LA, pp. 590-595, 2007
18. J. Reynolds, **X. Tan**, H. K. Khalil, “Closed-Loop Analysis of Slow Adaptation in the Control of Unknown Dynamic Hysteretic Systems,” *Proceedings of the 46th IEEE Conference on Decision and Control*, New Orleans, LA, pp. 3549-3554, 2007
19. **X. Tan**, “Self-organization of Autonomous Swarms via Langevin Equation,” *Proceedings of the 46th IEEE Conference on Decision and Control*, New Orleans, LA, pp. 1435-1440, 2007
20. J. Ahrens, **X. Tan**, H. K. Khalil, “Multirate Sampled-Data Output Feedback Control of Smart Material Actuated Systems” (**Invited**), *Proceedings of the American Control Conference*, New York, NY, pp. 4327-4332, 2007
21. **X. Tan**, H. K. Khalil, “Control of Unknown Dynamic Hysteretic Systems Using Slow Adaptation: Preliminary Results,” (**Best Session Presentation Award**), *Proceedings of the American Control Conference*, New York, NY, pp. 3294-3299, 2007
22. Z. Chen, **X. Tan**, A. Will, C. Ziel, “A Dynamic Model for Ionic Polymer-Metal Composite Sensors” (**Invited**), *Proceedings of the World Forum on Smart Materials and Smart Structures Technology*, Chongqin & Nanjing, China, 2007

23. Y. Fang, **X. Tan**, Y. Shen, N. Xi, G. Alici, "A Scalable Model for Trilayer Conjugated Polymer Actuators and Its Experimental Validation," Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) 2007, Proceedings of the SPIE*, Vol. 6524, pp. 652413, 2007
24. Y. Fang, **X. Tan**, G. Alici, "Robust Adaptive Control of Conjugated Polymer Actuators," Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) 2007, Proceedings of the SPIE*, Vol. 6524, pp. 652407, 2007
25. **X. Tan**, D. Kim, E. Goodman, M. Shahinpoor, "A Hands-on Paradigm for EAP Education: Undergraduates, Pre-college Students, and Beyond," Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) 2007, Proceedings of the SPIE*, Vol. 6524, pp. 652404, 2007
26. **X. Tan**, D. Kim, N. Usher, D. Laboy, J. Jackson, A. Kapetanovic, J. Rapai, B. Sabadus, X. Zhou, "An Autonomous Robotic Fish for Mobile Sensing," *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, Beijing, China, pp. 5424-5429, 2006
27. Y. Fang, **X. Tan**, "A Dynamic JKR Model with Application to Vibrational Release in Micromanipulation," *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, Beijing, China, pp. 1341-1346, 2006
28. Z. Chen, Y. Shen, J. Malinak, N. Xi, **X. Tan**, "Hybrid IPMC/PVDF Structure for Simultaneous Actuation and Sensing," Y. Bar-Cohen, editor, *Smart Structures and Materials 2006: Electroactive Polymer Actuators and Devices (EAPAD), Proceedings of SPIE*, San Diego, CA, Vol. 6168, pp. 435-443, 2006
29. W. Xi, **X. Tan**, J. S. Baras, "A Stochastic Algorithm for Self-Organization of Autonomous Swarms," *Proceedings of the 44th IEEE Conference on Decision and Control & European Control Conference*, Seville, Spain, pp. 765-770, 2005
30. W. Xi, **X. Tan**, J. S. Baras, "Gibbs Sampler-Based Path Planning for Autonomous Vehicles: Convergence Analysis," *Proceedings of the 16th IFAC World Congress*, Prague, Czech Republic, 2005
31. W. Xi, **X. Tan**, J. S. Baras, "A Hybrid Scheme for Distributed Control of Autonomous Swarms," *Proceedings of the American Control Conference*, Portland, OR, pp. 3486-3491, 2005
32. **X. Tan**, A. Modafe, R. Ghodssi, "Modeling of Velocity-Dependent Rolling Friction in Linear Microball Bearings," *Proceedings of World Tribology Congress III*, Washington, DC, Paper WTC2005-64025, 2005
33. Z. Chen, **X. Tan**, M. Shahinpoor, "Quasi-static Positioning of Ionic Polymer-Metal Composite (IPMC) Actuators," *Proceedings of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Monterey, CA, pp. 60-65, 2005

34. **X. Tan**, A. Modafe, R. Ghodssi, "An Empirical Model for Dynamic Friction in Micro-fabricated Linear Microball Bearings," *Proceedings of the American Control Conference*, Portland, OR, pp. 2463-2468, 2005
35. J. S. Baras, **X. Tan**, "Control of Autonomous Swarms Using Gibbs Sampling," *Proceedings of the 43rd IEEE Conference on Decision and Control*, Atlantis, Paradise Island, Bahamas, pp. 4752-4757, 2004
36. **X. Tan**, W. Xi, J. S. Baras, "Numerical Study on Joint Quantization and Control under Block-Coding," *Proceedings of the 43rd IEEE Conference on Decision and Control*, Atlantis, Paradise Island, Bahamas, pp. 4515-4520, 2004
37. **X. Tan**, A. Modafe, R. Hergert, N. Ghalichechian, B. Shapiro, J. S. Baras, R. Ghodssi, "Vision-Based Microtribological Characterization of Linear Microball Bearings," *Proceedings of the ASME/STLE International Joint Tribology Conference (Special Symposium on Contact Phenomena in MEMS)*, Long Beach, CA, Paper TRIB2004-64334, 2004
38. **X. Tan**, J. S. Baras, "Adaptive Inverse Control of Hysteresis in Smart Materials," *Proceedings of the IFAC Symposium on Nonlinear Control Systems*, Stuttgart, Germany, pp. 1553-1558, 2004
39. **X. Tan**, J. S. Baras, "Recursive Identification of Hysteresis in Smart Materials," (**Best Session Presentation Award**), *Proceedings of the American Control Conference*, Boston, MA, pp. 3857-3862, 2004
40. J. Jou, **X. Tan**, J. S. Baras, "A Parallel Virtual Queue Structure for Active Queue Management," *Proceedings of the 38th Annual Conference on Information Sciences and Systems*, Princeton, NJ, pp. 467-472, 2004
41. J. S. Baras, **X. Tan**, P. Hovareshti, "Decentralized Control of Autonomous Vehicles," *Proceedings of the 42nd IEEE Conference on Decision and Control*, Maui, HI, pp. 1532-1537, 2003
42. J. S. Baras, **X. Tan**, W. Xi, "Jointly Optimal Quantization, Estimation, and Control of Hidden Markov Chains," *Proceedings of the 42nd IEEE Conference on Decision and Control*, Maui, HI, pp. 1098-1103, 2003
43. **X. Tan**, J. S. Baras, P. S. Krishnaprasad, "A Dynamic Model for Magnetostrictive Hysteresis," *Proceedings of the American Control Conference*, Denver, CO, pp. 1074-1079, 2003
44. **X. Tan**, J. S. Baras, "A Robust Control Framework for Smart Actuators," *Proceedings of the American Control Conference*, Denver, CO, pp. 4645-4650, 2003
45. **X. Tan**, J. S. Baras, "Modeling and Control of a Magnetostrictive Actuator," (**Finalist, Best Student Paper Award**), *Proceedings of the 41st IEEE Conference on Decision and Control*, Las Vegas, NV, pp. 866-872, 2002

46. **X. Tan**, J. S. Baras, “Optimal Control of Hysteresis in Smart Actuators: A Viscosity Solutions Approach,” C. J. Tomlin, M. R. Greenstreet, editors, *the Springer series Lecture Notes in Computer Science (LNCS) Vol. 2289, Proceedings of the 5th International Workshop on Hybrid Systems: Computation and Control*, pp. 451-464, 2002
47. **X. Tan**, R. Venkataraman, P. S. Krishnaprasad, “Control of Hysteresis: Theory and Experimental Results,” V. S. Rao, editor, *Smart Structures and Materials 2001: Modeling, Signal Processing, and Control in Smart Structures, Proceedings of SPIE*, Newport Beach, CA, Vol. 4326, pp. 101-112, 2001
48. **X. Tan**, J. S. Baras, P. S. Krishnaprasad, “Fast Evaluation of Demagnetizing Field in Three Dimensional Micromagnetics Using Multipole Approximation,” V. V. Varadan, editor, *Smart Structures and Materials 2000: Mathematics and Control in Smart Structures, Proceedings of SPIE*, Newport Beach, CA, Vol. 3984, pp. 195-201, 2000
49. **X. Tan**, J. S. Baras, P. S. Krishnaprasad, “Computational Micromagnetics for Magnetostrictive Actuators”, V. V. Varadan, editor, *Smart Structures and Materials 2000: Mathematics and Control in Smart Structures, Proceedings of SPIE*, Newport Beach, CA, Vol. 3984, pp. 162-173, 2000
50. **X. Tan**, L. Tong, Z. Wang, Z. Yin, D. Zhang, “Characteristics and Firing Control of Thyristor Controlled Series Compensation Installations”, *Proceedings of IEEE International Conference on Power System Technology*, Beijing, pp. 672-676, 1998
51. **X. Tan**, N. Zhang, L. Tong, Z. Wang, “A Fuzzy Control Scheme for Thyristor Controlled Series Compensation in Transients of Power Systems,” *Proceedings of IEEE International Conference on Power System Technology*, Beijing, pp. 441-445, 1998
52. **X. Tan**, N. Zhang, L. Tong, Z. Wang, “A Fuzzy Control Scheme for Nonlinear Systems and its Application to Power Systems,” *Proceedings of the First IEEE International Conference on Intelligent Processing Systems*, Beijing, pp. 281-285, 1997

Other Conference Presentations:

1. **X. Tan** (presenter), O. Bennani, “Embedded Inverse Compensation of Hysteresis in Smart Material Actuators” (**Invited**), oral presentation at *the 13th International Symposium on Applied Electromagnetics and Mechanics*, East Lansing, MI, 2007
2. Y. Fang, **X. Tan** (presenter), G. Alici, “Robust Adaptive Control of Conjugated Polymer Actuators” (**Invited**), oral presentation at *the SIAM Conference on Control and Its Applications*, San Francisco, CA, 2007
3. Z. Chen, **X. Tan**, “A Dynamic Sensing Model for Ionic Polymer Metal Composites,” poster presentation at *Red Raider Mini-Symposium Series: Mathematical Modeling of Novel Materials and Devices*, Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX, 2006
4. **X. Tan**, “Almost Symplectic Runge-Kutta Schemes for Hamiltonian Systems” (**Invited**), oral presentation at *the 6th SIAM Conference on Control and Its Applications*, New Orleans, LA, 2005

5. **X. Tan**, “Preisach Operator-Based Modeling and Control of Hysteresis in Magnetostrictive Actuators” (**Invited**), oral presentation at *the 6th SIAM Conference on Control and Its Applications*, New Orleans, LA, 2005
6. R. V. Iyer (presenter), **X. Tan**, P. S. Krishnaprasad, “Approximate Inversion of the Preisach Hysteresis Operator with Application to Control of Smart Actuators,” oral presentation at *the AMS 2005 Spring Central Section Meeting*, Lubbock, TX, 2005
7. M. Khbeis, **X. Tan (presenter)**, G. Metze, R. Ghodssi, “Microfabrication of a Pressure Sensor Array Using 3D Integration Technology”, oral presentation at *the American Vacuum Society’s 50th International Symposium*, Baltimore, MD, 2003
8. M. Khbeis, **X. Tan**, “Microfabrication of a Pressure Sensor Array Using 3D Integration Technology” (poster), (**Best Poster Award**), *MEMS Alliance Special Topics Symposium: Materials and Fabrication Technologies for MEMS and NEMS*, College Park, MD, 2003
9. N. Ghalichechian, M. Khbeis, Z. Ma, S. Moghaddam, **X. Tan**, “A Piezoresistive Pressure Sensor Cluster” (poster), *MEMS Alliance Special Topics Symposium: MEMS Technologies in Biotech and Commercial Applications*, The Johns Hopkins University Applied Physics Laboratory, 2002
10. P. S. Krishnaprasad (presenter), **X. Tan**, “Cayley Transforms in Magnetics”, oral presentation at *the 5th SIAM Conference on Control and Its Applications*, San Diego, CA, 2001
11. **X. Tan (presenter)**, J. S. Baras, P. S. Krishnaprasad, “Computational Micromagnetics for Magnetostrictive Actuators”, oral presentation at *the 3rd SIAM Conference on Mathematical Aspects of Materials Science*, Philadelphia, PA, 2000

INVENTIONS

1. **X. Tan**, O. Bennani, “FPGA-based Embedded Compensation and Adaptation of Hysteresis in Smart Material Actuators,” Invention disclosure to MSU Office of Intellectual Property, (ID# 08-008F), 2007
2. **X. Tan**, D. Kim, “Wireless, Mobile Sensing Platform Based on Biomimetic Robotic Fish,” Invention disclosure to MSU Office of Intellectual Property (ID# 07-143F), 2007
3. **X. Tan**, Z. Chen, Y. Shen, N. Xi, “Integrated Actuator Sensor Structure,” U.S. patent pending, 2006

MEDIA COVERAGE OF RESEARCH & EDUCATION

1. “Career Plan Links Teaching, Research,” *MSU Today*, Summer 2006 issue
2. “Magnet Brings Toys to Class,” *the State News* (MSU paper), July 17, 2007

INVITED FULL-HOUR TALKS

1. Robotics, Controls and Mechatronics Colloquium, University of Washington, Seattle, WA, October 31, 2008, (Host: Prof. Santosh Devasia)
2. Servo Technology, Western Digital Corporation, Lake Forest, CA, March 11, 2008, (Host: Dr. Wei Xi)
3. Control Science Center of Excellence, Air Force Research Laboratory, Wright-Patterson AFB, OH, July 2, 2007, (Host: Dr. Raymond Holsapple) [Joint presentation with Prof. H. K. Khalil]
4. Institute of Modern Agriculture Science and Engineering, Tongji University, Shanghai, China, May 29, 2007, (Host: Prof. Lihong Xu)
5. Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI, December 1, 2006, (Host: Dr. Jerome P. Lynch)
6. Red Raider Mini-Symposium Series (**Outstanding Early-Career Speaker**), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX, November 10, 2006, (Host: Dr. Ram V. Iyer)
7. Center for Information and Systems Engineering, Boston University, Boston, MA, November 3, 2006, (Host: Dr. Sean Andersson)
8. Department of Mechanical Engineering, Michigan State University, East Lansing, MI, October 24, 2006, (Host: Dr. Patrick Kwon)
9. Beijing University of Aeronautics and Astronautics, Beijing, China, October 12, 2006, (Host: Dr. Jianqin Mao)
10. Mechanical Engineering Department Seminar, University of Nevada, Reno, NV, April 14, 2006, (Host: Dr. Kwang J. Kim)
11. Center for Advanced Control Technologies Seminar, Cleveland State University, Cleveland, OH, October 28, 2005, (Host: Dr. Zhiqiang Gao)
12. Applied Mathematics Seminar, Michigan State University, East Lansing, MI, April 7, 2005, (Host: Dr. Keith Promislow)
13. Applied and Interdisciplinary Mathematics Seminar, University of Michigan, Ann Arbor, MI, March 18, 2005, (Hosts: Drs. Anthony Bloch and Melvin Leok)
14. Control Seminar Series, University of Michigan, Ann Arbor, MI, November 12, 2004, (Host: Dr. James S. Freudenberg)
15. Small Smart Systems Center, University of Maryland, College Park, MD, February 20, 2004, (Host: Dr. Elisabeth Smela)
16. Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, February 9, 2004, (Host: Dr. Subir Biswas)

17. ISR Student-Faculty Colloquium, Institute for Systems Research, University of Maryland, College Park, MD, May 13, 2003, (Host: Dr P. S. Krishnaprasad)

PROFESSIONAL MEMBERSHIP AND SERVICE

1. Professional membership

- Member, IEEE
- Member, ASME

2. Editorship

- Associate Editor, Automatica, April 1, 2008 - March 31, 2011
- Guest Editor (with Dr. Ram V. Iyer), IEEE Control Systems Magazine, Special issue on Hysteresis, 2007 - 2008
- Member, IEEE Control Systems Society Conference Editorial Board, 2007 -
- Member, Editorial Board of International Journal of Applied Electromagnetics and Mechanics, for special issue of Proceedings of 13th International Symposium on Applied Electromagnetics and Mechanics (ISEM'2007)
- Associate Editor, ISA Conference Editorial Board for American Control Conference (ACC'2005, 2006)

3. Conference program committees and organizing committees

- Organizing committee member and co-chair for poster sessions, 2009 IEEE/RSJ International Conference on Intelligent RObots and Systems (IROS'2009)
- International program committee member, 2009 International Symposium on Intelligent Control (ISIC'2009)
- Program committee member, American Control Conference (ACC'2008, ACC'2010)
- International program committee member, ASME/IEEE International Conference on Mechatronic and Embedded Systems and Applications (MESA'2007, MESA'2008)
- Organizing committee member and co-chair for poster sessions, IEEE International Conference on Robotics and Biomimetics (ROBIO'2008)
- Organizing committee member, International Symposium on Applied Electromagnetics and Mechanics (ISEM'2007)
- Program committee member, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'2006)
- Organizing committee member & Co-chair for local arrangements and awards, IEEE International Conference on Electro/Information Technology (EIT'2006)
- Program committee member, IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'2005, AIM'2007)

4. Conference panels, workshops, and special sessions

- Organizer, invited session on “Smart Materials”, International Symposium on Applied Electromagnetics and Mechanics, East Lansing, MI, 2007
- Organizer (with Dr. Kwang J. Kim), invited session on “Electroactive Polymer Sensors and Actuators”, World Forum on Smart Materials and Smart Structures Technology, Chongqin & Nanjing, China, 2007
- Organizer (with Dr. Ram V. Iyer), special session on “Modeling, Analysis and Control of Systems with Hysteresis”, American Control Conference, New York, NY, 2007
- Invited instructor, tutorial on “Electro-Active Polymer Actuators and Sensors in Robotics”, IEEE/RSJ International Conference on Intelligent Robots and Systems, Beijing, China, 2006
- Panelist, NSF/ARO/AACC session “Early Career Development”, American Control Conference, Minneapolis, MN, 2006

5. Conference session chair/co-chair

- American Control Conference, Seattle, WA (2008, Session WeC03)
- International Symposium on Applied Electromagnetics and Mechanics, East Lansing, MI (2007, Session M-PM-2)
- American Control Conference, New York, NY (2007, Session FrA03)
- World Forum on Smart Materials and Smart Structures Technology, Chongqing & Nanjing, China (2007, Session S27)
- IEEE/RSJ International Conference on Intelligent Robots and Systems, Beijing, China (2006, Session FP1-13)
- Nanomedicine Conference, East Lansing, MI (2006, Hot Topic Session in Symposium II)
- American Control Conference, Portland, OR (2005, Session FrA03)
- American Control Conference, Denver, CO (2003, Session FM11)
- Third SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA (2000, Session CP11)

6. Reviewer for government agencies

- Panelist, NSF, 2004; 2006 (twice); 2008
- Reviewer, NSF, 2005

7. Reviewer for archival journals

- ASME Journal of Dynamic Systems, Measurement and Control
- Automatica
- Chaos: An Interdisciplinary Journal of Nonlinear Science
- Continuum Mechanics and Thermodynamics

- Discrete and Continuous Dynamical Systems
- IEEE Control Systems Magazine
- IEEE Signal Processing Letters
- IEEE Transactions on Automatic Control
- IEEE Transactions on Control Systems Technology
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Magnetics
- IEEE/ASME Transactions on Mechatronics
- IEEE Transactions on Neural Networks
- IEEE Transactions on Robotics
- IEEE Transactions on Systems, Man, and Cybernetics C
- International Journal for Numerical Analysis and Modeling
- International Journal on Mechatronics
- International Journal of Control
- International Journal of Modelling and Simulation
- Journal of Computational and Applied Mathematics
- Journal of Intelligent Material Systems and Structures
- Journal of Magnetism and Magnetic Materials
- Journal of Vacuum Science and Technology A
- Journal of Zhejiang University Science A
- Materials Science and Engineering: C
- Optimal Control, Applications and Methods
- Physica B
- Sensors and Actuators A: Physical
- SIAM Journal on Applied Mathematics
- Smart Materials and Structures

8. Reviewer for publishers

- Pan Stanford Publishing, Singapore, 2008
- McGraw-Hill Companies, 2007
- Springer, 2006

9. Reviewer for conferences

- American Control Conference (ACC 2004, 2005, 2007, 2008, 2009)
- European Control Conference (ECC 2007, 2009)
- IEEE Conference on Control Applications (CCA 2004, 2006)

- IEEE Conference on Decision and Control (CDC 2004, 2005, 2006, 2007)
- IEEE Conference on Robotics and Automation (ICRA 2008)
- IEEE International Conference on Electro/Information Technology (EIT 2006)
- IEEE International Conference on Networks (ICON 2004)
- IEEE International Conference on Robotics and Biomimetics (ROBIO 2008)
- IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2005, AIM 2007)
- IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA 2008)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2006, 2008)
- IFAC World Congress (2005,2008)
- Joint International Symposium on Intelligent Control & 13th Mediterranean Conference on Control and Automation (ISIC-MED 2005)

UNIVERSITY/COLLEGE/DEPARTMENT SERVICE

1. Advisor (or co-advisor) of graduate students

- Freddie Alequin-Ramos, Ph.D. program, Fall 2008 -
- Dan Jakeway (Co-advisor: Dr. Hassan Khalil), Ph.D. program, Fall 2008 -
- Dawn Hedgepeth, Ph.D. program, Fall 2007 -
- Yang Fang, Ph.D. program, Fall 2005 -
- Zheng Chen, Ph.D. program, Spring 2005 -
- Stephan Shataru, M.S., December 2008. Thesis: *Development of Small Biomimetic Robotic Fish with Onboard Fine-Grained Localization*. Currently with Motorola.
- Nathan Usher, M.S., August 2007. Thesis: *Digital Low-Level Radio Frequency Control and Microphonics Mitigation of Superconducting Cavities*. Currently with the National Superconducting Cyclotron Laboratory at Michigan State University.
- Jeff Ahrens (Principal advisor: Dr. Hassan Khalil), Ph.D., December 2006. Dissertation: *Design and Performance Tradeoffs of High-Gain Observers with Applications to Smart Material Actuated Systems*. Currently with Sullivan Park Research Center, Corning Incorporated.

2. Advisor of postdoctoral researchers

- Dr. Mart Anton, August 2008 - June 2009

3. Advisor of exchange students

- Stephan Henneberger, Study Thesis, University of Kaiserslautern, Germany, August 2007 - February 2008. Thesis: *A Sliding Discrete Fourier Transform (SDFT)-based Localization System for Small Fish Robots*.

- Ernest Mbemmo, Master's Thesis, University of Kaiserslautern, Germany, January 2007 - September 2007. Thesis: *Design and Modeling of Biomimetic Robotic Fish Propelled by an IPMC*.
- Alex Will, Study Thesis, University of Kaiserslautern, Germany, May 2006 - September 2006. Thesis: *Dynamic Sensing Model for Ionic Polymer Metal Composites*.

4. Member of thesis committees

- Chi Zhang (Advisor: Dr. Ning Xi/ECE), Ph.D. Program, Spring 2008 -
- Attaullah Memon (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D. Program, Fall 2007 -
- Shahid Nazrulla (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D. Program, Fall 2007 -
- Alexis Ball (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D. Program, Summer 2007 -
- Hua Deng (Advisor: Dr. Thomas Pence/ME), Ph.D. program, Fall 2006 -
- Li Sun (Advisor: Dr. Patrick Kwon/ME), Ph.D. program, Fall 2006 -
- James Reynolds (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2007
- Luma Vasiljevic (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2007
- Tarik H. Kandil (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2005

5. University committees

- University Appeals Board, March 2007 -

6. Departmental committees

- Advisory Committee of ECE Department, Fall 2008 -
- ECE Seminar Series Coordinator, Fall 2006 - Spring 2008
- Graduate Studies Committee, Fall 2005 - Spring 2006
- Graduate Admissions Recruiting & Financial Aids Committee (GARFAC), Fall 2005 - Spring 2006

7. Ad hoc committees

- College of Engineering Web Design Committee, June 2007 -
- Search Committee for Recruitment and Retention Coordinator, Diversity Programs Office, Michigan State University, 2005 - 2006
- Faculty Advisor, Undergraduate Research Program, Diversity Programs Office, Michigan State University, 2005

CONSULTING SERVICE

1. Lear Corporation, 2005