Hongtao Zhang

Post-Doctoral Fellow
Applied Mathematics
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Education:

- Ph.D. (9/2006 –12/2010), University of Waterloo, Canada

  Department of Electrical and Computer Engineering

- M.Sc. (9/2001 – 7/2004), Huazhong University of Science and Technology, China

  Department of Control Theory and Control Engineering

- B.Sc. (9/1997 – 7/2001), Wuhan University, China

  Department of Automation

Research Interests:

- Power management optimization in hybrid electric vehicles；
- Synchronization of complex systems/networks；
- Chaos synchronization with applications to secure communication;
- Chaotic attractors and bifurcation.

Publications:

Journal Papers:

1. H. Zhang, X. Liu, X. Shen, and J. Liu, "Chaos entanglement: a new approach to chaos", (accepted to International Journal of Bifurcation and Chaos).

2. H. Zhang, X. Liu, X. Shen, and J. Liu, "Intermittent impulsive synchronization of hyperchaos with application to secure communication", (accepted to Asian Journal of Control).

3. X. Liu, X. Shen, and H. Zhang, "Multi-scroll chaotic and hyperchaotic attractors from chen system", *International Journal of Bifurcation and Chaos*, Vol. 22, No. 2, 2012.

4. H. Zhang, X. Liu, X. Shen, and J. Liu, "A family of new chaotic and hyperchaotic Attractors from delay differential Equation", *Dynamics of Continuous, Discrete and Impulsive Systems, Series B: Application and Algorithms*, Vol. 47, No. 12, pp. 411--430, 2012.

5. J. Liu, X. Liu, W.C. Xie, and H. Zhang, "Stochastic consensus seeking with communication delays", *Automatica*, Vol. 19, No. 3, pp. 2689--2696, 2011.

6. X. Liu, X. Shen, and H. Zhang, "Intermittent impulsive synchronization of chaotic delayed neural networks", *Differential Equations and Dynamical Systems*, Vol. 19, No. 1-2, pp. 149--169, 2011.

7. X. Liu and H. Zhang, "Impulse control of PWM Switching converter ", *Nonlinear Studies*, Vol. 18, No. 4, pp. 611--619, 2011.

8. Y. Li, X. Liu, and H. Zhang, "A new unified chaotic system and its impulsive synchronization", *Dynamics of Continuous, Discrete and Impulsive Systems, Series B: Application and Algorithms*, Vol. 16, No. 4, pp. 573--587, 2009.

9. X. Liu, K.L. Teo, H. Zhang, and G.R. Chen, "Switching control of linear systems for generating chaos", *Chaos, Solitons & Fractals*, Vol. 30, No. 3, pp. 725--733, 2006.

10. X. Liu and H. Zhang, "Robust stability of impulsive switched systems with disturbance", *the ANZIAM Journal*, Vol. 48, No. 2, pp. 259--270, 2006.

11. Y. Li, X. Liu, and H. Zhang, "Dynamical analysis and impulsive control of a new hyperchaotic system", *Mathematical and Computer Modelling*, Vol. 42, No. 11-12, pp. 1359--1374, 2005.

12. X. Liu and H. Zhang, "Robust H-infinity control on impulsive switched systems with disturbance", *Control Theory & Applications*, Vol. 21, No. 2, pp. 261--266, 2004.

13. H. Zhang, X. Liu, and W. Xie, "Frequency synchronization in networks of multi-agent systems", (submitted).

14. H. Zhang, X. Liu, and X. Shen "Adaptive network synchronization subject to network nodes with unknown parameters and different structures", (submitted).

15. H. Zhang, X. Liu, and X. Shen, "Impulsive synchronization of uncertain dynamical networks with coupling delay and impulsive delay", (in progress).

16. H. Zhang, X. Liu, and X. Shen, "Synchronization of chaotic lur'e systems by impulsive control and output feedback with delay", (in progress).

Conference Paper:

1. H. Zhang, X. Liu, and X. Li, "Chaos entanglement: leading linear systems to chaos", (submitted to AMMCS-2013).

2. H. Zhang, Y. Qian, X. Li, and X. Liu, "Driver-oriented optimization of power management in plug-in hybrid electric vehicles", (submitted to 2013 CCTC).

3. S. Bi, Z. Shi, H. Zhang, and X. Shen, "Experimental study on particle filter based synchronization of chaotic Colpitts circuit with application to secure communications", Proc. WCSP'12, Huangshan, China, Oct. 25-27, 2012 (Best Paper Award).

4. H. Zhang, L. Cai, X. Liu, and X. Shen, "Boundedness of heterogeneous TCP flows with multiple bottlenecks", in Proc. IEEE WCNC, Sydney, Australia, April 18-21, 2010.

Academic Activities:

- Organization Committee, Applied Mathematics, Modeling and Computational Science Conference, August 26-30, 2013

- Participant, the 3rd Climate Change Technology Conference 2013, May 27-29, 2013

- Participant, Green Auto Power Train 3rd Annual General Meeting 2012, November 16, 2012

- Organization Committee, the 8th International Conference on Differential Equations and Dynamical Systems, August 1-4, 2012

- Participant, Applied Mathematics, Modeling and Computational Science Conference, July 25-29, 2011
  Title: Intermittent Impulsive Synchronization of Delayed Chaotic Neural Networks

- Participant, 2010 IEEE Wireless Communications and Networking Conference, April 18-21, 2010
  Title: Boundedness of Heterogeneous TCP Flows with Multiple Bottlenecks

- Participant, The 2010 Graduate Student Research Conference, April 26-30, 2010
  Title: Adaptive Impulsive Synchronization of Complex Dynamical Networks

- Organization Committee, Workshop on Hybrid Dynamic Systems, July 29-31, 2010
  Title: Multi-Scroll Chaotic and Hyperchaotic Attractors Generated from Chen System

Work Experiences:

- Post-Doctoral Fellow (1/2011-present), University of Waterloo
  Power management optimization in hybrid electric vehicles
  Supervisors: Prof. Xinzhi Liu and Prof. Xianguo Li

- Post-Doctoral Fellow (1/2011-8/2011), University of Waterloo
  Consensus and synchronization in networks of multi-agent systems
  Supervisors: Prof. Xinzhi Liu and Prof. Wei-Chau Xie

- Post-Doctoral Fellow (1/2011-8/2011), University of Waterloo
  Synchronization of complex systems/networks
  Supervisors: Prof. Xinzhi Liu and Prof. Xuemin Shen

- Research Assistant (9/2006-12/2010), University of Waterloo
  Chaos synchronization and its applications to secure communication
  Supervisors: Prof. Xuemin Shen and Prof. Xinzhi Liu

- Research Assistant (12/2003-6/2004), Hong Kong Polytechnic University
  Chaotic attractors and dynamical analysis
  Supervisor: Prof. Kok-Lay Teo

- Visiting Scholar (9/2002), City University of Hong Kong
  Circuit realization of chaotic attractors
  Supervisor: Prof. Guanrong Chen

Honors and Awards:

1. UW Special Graduate Scholarship, 2009-2010 (three terms), University of Waterloo;
2. International Doctoral Student Award, 2006-2010, University of Waterloo;
3. University of Waterloo Graduate Scholarship, 2008-2010 (six terms), University of Waterloo.

Ph.D. Advisors:

Xuemin (Sherman) Shen
Department of Electrical and Computer Engineering
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