

## **Qing Wang**

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# **CURRICULUM VITAE**

## **EDUCATION**

- **Ph.D.** in Applied Mathematics, University of Waterloo, Waterloo, Ontario, January 2003 - April 2007;
- **M.S.** in Mathematics, Hunan Normal University, Changsha, Hunan, China, September 1999 - June 2002;
- **B.S.** in Mathematics, Hunan Normal University, Changsha, Hunan, China, September 1995 - June 1999.

## **RESEARCH INTERESTS**

My research interests have focused on three specific areas: the stability and boundedness of dynamical systems, especially impulsive systems; the impulsive stabilization of delay differential equations, in particular using the Lyapunov-Razumikhin technique and the Lyapunov functional method; and applications to neural networks, secure communication, and population growth models.

## **ACADEMIC EXPERIENCE**

1. **Assistant Professor (tenure-track)**, Department of Computer Science, Mathematics, and Engineering, Shepherd University, August 2008 – present;

Courses taught:

- MATH 321 – Probability and Statistics, Aug. 2008 – Dec. 2008; Jan. 2010 – May 2010;
- MATH 314 – Statistics, Aug. 2008 – Dec. 2008, Jan. 2009 – May 2009, Aug. 2009 – Dec. 2009; Aug 2010 – Dec. 2010;
- MATH 310 – Differential Equations, Jan. 2009 – May 2009; Jan. 2011 – May 2011
- MATH 309 – Calculus III, Jan. 2009 – May 2009; Jan. 2010 – May 2010;
- MATH 307 – Linear Algebra, Aug. 2009 – Dec. 2009; Aug. 2010 – Dec. 2010;

- MATH 207 – Calculus I, January 2011 – May 2011; August 2011 – December 2011;
  - MATH 208 – Calculus II, Aug. 2009 – Dec. 2009; Jan. 2010 – May 2010;
  - MATH 205 – Calculus with Applications, Aug. 2008 – Dec. 2008; Aug. 2010 – Dec. 2010;
  - MATH 108 – Pre-calculus, January 2011 – May 2011; August 2011 – December 2011;
  - MATH101 – Fundamentals of Mathematics, Summer I and II, 2011
2. **Visiting Assistant Professor**, Department of Computer Science, Mathematics, and Engineering, Shepherd University, August 2007 – May 2008;

Courses taught:

- MATH 208 – Calculus II, January 2008 – May 2008;
  - MATH 207 – Calculus I, January 2008 – May 2008;
  - MATH 154 – Finite Mathematics, January 2008 – May 2008;
  - MATH 434 – Senior Capstone Practicum, January 2008 – May 2008;
  - MATH 318 - Numerical Analysis, August 2007 – December 2007;
  - MATH 307 - Linear Algebra, August 2007 – December 2007;
  - MATH 108 – Pre-calculus, August 2007 – December 2007;
3. **Postdoctoral Fellow and/or Lecturer**, Department of Applied Mathematics, University of Waterloo, May 2007-August 2007; January 2005-April 2005;

Courses taught:

- MATH 137 - Calculus I for Honors Math, May 2007 – August 2007;
  - MATH 138 - Calculus II for Honors Math, May 2007 – August 2007;
  - MATH 228 - Differential Equations for Physics and Chemistry, January 2005 - April 2005;
4. **Research Assistant**, Department of Applied Mathematics, University of Waterloo, January 2003 – April 2007;
5. **Teaching Assistant**, Department of Applied Mathematics, University of Waterloo, January 2003 – April 2007;

- Math Tutor: MATH 115 - Linear Algebra for Engineering, MATH 127 - Calculus 1 for the Sciences, AMATH 231 - Calculus 4, MATH 211 - Advanced Calculus for Electrical and Computer Engineering, AMATH 250 - Introduction to Differential Equations, running tutorial sessions or quizzes.
- Math Marker: MATH 115 - Linear Algebra for Engineering, MATH 127 - Calculus 1 for the Sciences, MATH 211 - Advanced Calculus for Electrical and Computer Engineering, AMATH 231 - Calculus 4, AMATH 250 - Introduction to Differential Equations, AMATH 351 - Ordinary Differential Equations 2, AMATH 343 - Discrete Models in

## **GRANTS AND FUNDED ACTIVITIES**

1. National Natural Science Foundation of China, grant number: 10801056, Optimal Control, Stability Theory and Applications of Stochastic Processes (PI: Quanxin Zhu), January 2009 – December 2011;
2. Summer Professional Development Grant (Shepherd University Internal Grant), Stability Analysis of a Class of Linear Differential Equations with Delayed Impulses, May 2009 – December 2009;
3. NASA West Virginia Space Research Enhancement Grant, Impulsive Control and Applications to Secure Communications, March 2008 - August 2008;
4. NASA Space Grant Fellowship, grant proposal for Jeremiah Alexander (undergraduate student), research project on “Fibonacci Numbers”, November 2007 - May 2008;
5. NASA Space Grant Fellowship, grant proposal for Kristel Chase (undergraduate student), research project on “Analysis on SARS Models”, November 2008 - May 2009.
6. NASA Space Grant Fellowship, grant proposal for Chase Dowling (undergraduate student), research project on “The Reproductive Ratio of Pandemic H1N1/09 Influenza Virus in Active Duty Military Personnel”, November 2009 - May 2010.
7. SOARS Scholarship, grant proposal for Dustin Revell (undergraduate student), research project on “Bacteria growth model”, Summer 2011.

## **PUBLICATIONS**

### **Refereed Journal Articles**

1. Q. Wang and X. Liu, Impulsive Stabilization of Cellular Neural Networks with Time Delay via Lyapunov Functionals, *Journal of Nonlinear Sciences and its Applications*, 1(2008), no. 2, 72-86.
2. X. Liu and Q. Wang, Impulsive Stabilization of High-Order Hopfield-Type Neural Networks with Time-varying Delays, *IEEE Transactions on Neural Networks*, 19(2008), no. 1, 71-79.

3. X. Liu, X. Shen, Y. Zhang, and Q. Wang, Stability Criteria for Impulsive Systems with Time Delay and Unstable System Matrices, *IEEE Transactions on Circuit and Systems I*, 54(2007), 2288-2298.
4. Q. Wang and X. Liu, Exponential Stability of Impulsive Cellular Neural Networks with Time Delay via Lyapunov Functionals, *Applied Mathematics and Computation*, 194(2007), 186-198.
5. Q. Wang and X. Liu, Impulsive Stabilization of Delay Differential System via the Lyapunov-Razumikhin Method, *Applied Mathematics Letters*, 20(2007), no. 8, 839-845.
6. X. Liu and Q. Wang, The Method of Lyapunov Functionals and Exponential Stability of Impulsive Systems with Time Delay, *Nonlinear Analysis*, 66(2007), 1465-1484.
7. X. Liu and Q. Wang, On Stability in Terms of Two Measures for Impulsive Systems of Functional Differential Equations, *Journal of Mathematical Analysis and Applications*, 326(2007), 252-265.
8. Q. Wang and X. Liu, Razumikhin Technique via Two Lyapunov Functions and Applications to Votka-Volterra Systems with Time Delay and Impulsive Effects, *Dynamic Systems and Applications*, 15(2006), 617-628.
9. X. Liu and Q. Wang, Stability of Nontrivial Solution of Delay Differential Equations with State-dependent Impulses, *Applied Mathematics and Computation*, 174(2006), 271-288.
10. J. Shen, J. Li, and Q. Wang, Boundedness and Periodicity in Impulsive Ordinary and Functional Differential Equations, *Nonlinear Analysis*, 65(2006), 1986-2002.
11. B. Liu, X. Liu, K. Teo, and Q. Wang, Razumikhin-type Theorems on Exponential Stability of Impulsive Delay Systems, *IMA Journal of Applied Mathematics*, 71(2006), 47-61.
12. Q. Wang and X. Liu, Exponential Stability for Impulsive Delay Differential Equations by Razumikhin Method, *Journal of Mathematical Analysis and Applications*, 309(2005), 462-473.
13. Q. Wang, J. Shen, and X. Liu, Lipschitz Stability of Impulsive Functional Differential Equations by Razumikhin Method, *Nonlinear Functional Analysis and Applications*, 10-4(2005), 613-628.
14. Q. Wang and J. Shen, Oscillation Criteria for Delay Equations with Piecewise Constant Argument, *Acta Sci. Natur. Univ. Norm. Hunan*, 23(2000), 6-11.

## Refereed Conference Articles

15. Q. Wang and W. Liao, Stability Analysis of Impulsive BAM Neural Networks with Delays, Proceedings of the 6th International Conference on Differential Equations and Dynamical Systems, DCDIS A Supplement, Watam Press, 2009, 127-132.
16. X. Liu and Q. Wang, Boundedness of Solutions of Functional Differential Equations with State-dependent Impulses, Proceedings of the Conference on Differential & Difference Equations and Applications, Hindawi Publishing Corporation, 2006, 699-710.
17. Q. Wang and X. Liu, Global Exponential Stability of Impulsive High Order Hopfield Type Neural Networks with Delays, Proceedings of the Fourth International DSDIC Conference on Engineering Applications and Computational Algorithms, Watam Press, 2005, 825-830.

## Other Publications

18. W. Liao, Q. Wang, and Z. Wang, ECCAD Poster Abstracts, ACM Communications in Computer Algebra, Vol. 42, No. 2, 67-91, June 2008.

## Submitted Articles

19. Q. Wang and X. Liu, Stability Criteria of a Class of Nonlinear Impulsive Switching Systems with Variable Time Delays.
20. Q. Wang and Quanxin Zhu, Razumikhin-Type Stability Criteria for Differential Equations with Delayed Impulses.
21. Quanxin Zhu and Q. Wang, Impulsive Stabilization of Stochastic Functional Equations via the Lyapunov-Razumikhin Method.
22. Q. Wang and Zhijun Wang, Global Exponential Stability of a Class of Nonlinear Differential Equations with Delayed Impulses.
23. Zhijun Wang and Q. Wang, Simulation of SARS Model with Impulsive Control Describing Spread and Control Patterns of SARS Virus.

## PRESENTATIONS

1. “Impulsive Stabilization of Lorenz Systems and Applications”, SIAM Conference on Control and Its Application (CT11), Baltimore, MD, July 26, 2011.

2. “Stability Criteria for Systems with Delayed Impulses via Lyapunov Method”, The Sixth International Conference on Dynamic Systems and Applications, Atlanta, GA, May 26, 2011.
3. “Stability Analysis and Numerical Simulations of a SARS Model”, ECCAD2009, University of Rhode Island, Kingston, Rhode Island, May 2, 2009;
4. “Impulsive Delay Differential Equations and Applications”, Hunan Normal University, Hunan, China, June 12, 2008;
5. “Global Exponential Stability of Impulsive BAM Neural Networks with Time-varying Delays”, the 6<sup>th</sup> International Conference on Differential Equations and Dynamical Systems, Morgan State University, Baltimore, Maryland, May 24, 2008.
6. “Impulsive Control of Cellular Neural Networks with Time Delays”, University of Waterloo, Ontario, October 24, 2006;
7. “Exponential Stability of Impulsive Differential Equations with Time Delay and Applications to Neural Networks”, University of Waterloo, Ontario, November 15, 2005;
8. “Global Exponential Stability of Impulsive High Order Hopfield Type Neural Networks with Delays”, the Fourth International DSDIC Conference on Engineering Applications and Computational Algorithms, University of Guelph, Ontario, July 27, 2005.

## **UNDERGRADUATE STUDENT RESEARCH PRESENTATION SUPERVISION**

1. Dustin Revell, oral presentation on “Applications and Experimental Results of Newton’s Law of Heating and Cooling”, the 86th Annual Meeting of the WVAS, West Virginia University, WV, April 2, 2011.
2. Katherine Hoeck, Matthew Behrmann, Trey Knepper, and Benjamin Reichard, “Harvest strategies using modifications of the logistic equation”, the 86th Annual Meeting of the WVAS, West Virginia University, WV, April 2, 2011.
3. Chase Dowling, oral presentation on “The Reproductive Ratio of Pandemic H1N1/09 Influenza Virus in Active Duty Military Personnel”, the 85th Annual Meeting of the WVAS, West Virginia University, WV, April 10, 2010.
4. Kristel Chase, oral presentation on Analysis on SARS Models, the 84 Annual Meeting of the West Virginia Academy of Science, Glenville State College, Glenville, West Virginia, March 28, 2009;

5. Jeremiah Alexander, oral presentation on Fibonacci Numbers, the 83rd Annual Meeting of the West Virginia Academy of Science, Fairmont State University, Fairmont, West Virginia, April 5, 2008.
6. Michael A. Kelsey and Matthew G. Prince, poster presentation on Dynamics of Population Growth, the 6<sup>th</sup> International Conference on Differential Equations and Dynamical Systems, Morgan State University, Baltimore, Maryland, May 22, 2008.
7. Poster presentations (eight Shepherd undergraduate posters), ECCAD 2008, Shepherd University, Shepherdstown, West Virginia, May 10, 2008.
8. Capstone projects, Shepherd University, January 2008 – April 2008.

## **SCHOLARSHIPS AND AWARDS**

1. Ontario Graduate Scholarship (OGS), University of Waterloo, May 2006 - April 2007;
2. 2006 Chinese Government Award for Excellent Oversea Students, April 2007;
3. President's Graduate Scholarship, University of Waterloo, May 2006 - April 2007;
4. International Graduate Student Award, University of Waterloo, January 2003 - August 2004, January 2005 - April 2005;
5. University of Waterloo Graduate Merit Scholarship, September 2005 - April 2006;
6. International Doctoral Student Award, University of Waterloo, September 2004 - April 2006;
7. University of Waterloo Graduate Scholarship, January 2004 - April 2004, September 2004 - April 2005;
8. Excellent Graduate Activity Awards, Hunan Normal University, Changsha, Hunan, China, September 2000 – June 2002;
9. 1999 Hunan Province Excellent Graduate Student, Hunan Normal University, Changsha, Hunan, China, 1999;
10. 1<sup>st</sup> Grade Professional Scholarship, Hunan Normal University, Changsha, Hunan, China, September 1995 – June 1999;
11. 1<sup>st</sup> Grade Midterm Level Professional Scholarship, Hunan Normal University, China, September 1997 - June 1999;
12. Undergraduate Scholarship, Hunan Normal University, China, September 1998 - June 1999;
13. 3<sup>rd</sup> Grade Awards in 1998 Chinese Undergraduate Mathematical Modeling Contest, Hunan Normal University, China, 1998.

## **PROFESSIONAL ACTIVITIES**

Textbook Review: Intro Stats, 3e, by De Veaux/Velleman/Bock, August 2009.

Reviewed papers for Journals:

1. IEEE Transactions on Neural Networks
2. Dynamics of Continuous, Discrete and Impulsive Systems
3. Computers and Mathematics with Applications
4. Mathematical and Computer Modeling

Conference Services:

1. Judge and session chair at the 84 Annual Meeting of the West Virginia Academy of Science, Glenville State College, Glenville, West Virginia, March 28, 2009;
2. A member in the organizing committee and local arrangement committee at the ECCAD 2008 Conference, Shepherd University, Shepherdstown, West Virginia, May 10, 2008;
3. Reviewer for the conference ISSAC 2009;
4. Conference assistant and reviewer, the Third International DCDIS Conference on Engineering Applications and Computational Algorithms, Guelph, Ontario, May 15 - 18, 2003;
5. Conference assistant and reviewer, the Fourth International DCDIS Conference on Engineering Applications and Computational Algorithms, Guelph, Ontario, July 27 - 29, 2005;
6. Conference assistant and reviewer, International Workshop on Differential Equations and Dynamical Systems, Guelph, Ontario, July 29 - 31, 2005.

## **PROFESSIONAL SOCIETY MEMBERSHIPS**

- Mathematical Association of America (MAA)
- West Virginia Academy of Science (WVAS)