

# Wandi Ding

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- EDUCATION
- **Ph.D.** Applied Mathematics University of Tennessee, Knoxville, TN 2006
  - **M.S.** Applied Mathematics Ocean University of China, 2001
  - **B.S.** Mathematics Education Qingdao University, China, 1998
- RESEARCH INTEREST
- Optimal Control || Partial Differential Equations || Differential and Difference Equations || Hybrid System || Natural Resource Modeling || Population Dynamics || Disease Modeling
- PROFESSIONAL EXPERIENCE
- **Assistant Professor** August 2007 - current  
Department of Mathematical Sciences  
Middle Tennessee State University (MTSU), Murfreesboro, TN
  - **Post Doctoral Research Associate** August 2006 - July 2007  
Department of Mathematics, University of Tennessee-Knoxville (UTK)
- TEACHING EXPERIENCE
- **Assistant Professor** 2007 - current  
(*Associate Graduate Faculty and Honors Faculty*)  
Department of Mathematical Sciences, Middle Tennessee State University
    - Graduate courses: Analysis I, Analysis II (Independent Study).
    - Undergraduate courses: Theory of Calculus, Calculus I, II, III, Applied Calculus I, Differential Equations I, Data Analysis, Applied Statistics, Plane Trigonometry, Mathematics for General Studies for Honors.
  - **Graduate Teaching Associate** 2001 - 2006  
Department of Mathematics, University of Tennessee-Knoxville (UTK)
    - Undergraduate courses: Basic Calculus, Calculus I and Math for Life Science II.
    - Lab: Conducted Numerical Analysis Labs.
  - **Graduate Assistant** Summer 2005  
Research Experiences for Undergraduates (REU) program at UTK.
- PUBLICATIONS
- Wandi Ding and Suzanne Lenhart.  
[6] *Introduction to Optimal Control for Discrete Time Models with an Application to Disease Modeling*, Modeling Paradigms and Analysis of Disease Transmission Models, 109-119, **DIMACS Ser. Discrete Math. Theoret. Comput. Sci.**, **75**, Amer. Math. Soc., Providence, RI, 2010.
  - Wandi Ding, Heather Finotti, Suzanne Lenhart, Yuan Lou and Yuquan Ye.  
*Optimal Control of the Growth Coefficient on a Steady State Population Model*. **Nonlinear Anal. Real World Appl.** 11, 688-704, 2010.
  - Wandi Ding and Suzanne Lenhart.  
*Optimal Harvesting of a Spatially Explicit Fishery Model*. **Natural Resource Modeling**, 22:2, 173-211, May, 2009.
  - Wandi Ding, Louis J. Gross, Keith Langston, Suzanne Lenhart and Leslie A. Real.  
*Rabies in Raccoons: Optimal Control for a Discrete Time Model on a Spatial Grid*. **Journal of Biological Dynamics**, 1:4, 379-393, October, 2007.
  - Wandi Ding.  
*Optimal Control of Hybrid ODE Systems with Application to a Tick Disease Model*. **Mathematical Biosciences and Engineering**, 4:4, 633-659, October, 2007.

- Shusen Xie and Wandi Ding.  
*Linear Modified Finite Difference Method Combined with Characteristics for Convection-Diffusion Problems*. **J. Qingdao University of Science & Technology**, China, 2:9-13, 2002.
- TECHNICAL ○ Natalie Almond, Wandi Ding, Xiaochuan Li, Xingtao Liu, Steven Rusnica, Ismael Velzquez-  
REPORTS AND Ramrez, Emily Lada, Fazafumi Ito, Michael Horton, Mellisa Choi.  
PREPRINTS *Mobile Sensing of Aerosolized Chemical and Biological Agents*. **CRSC (The Center for Research in Scientific Computation) Technical Report**, CRSC-TR04-41, 15-26, December, 2004, <http://www.ncsu.edu/crsc/events/imsm05/publication.htm>.
- Shusen Xie and Wandi Ding.  
*Optimal Numerical Primitive Function Formula in the Space  $W(p;B)$* . Preprint, 2002.
- SUBMITTED ○ W. Ding, V. Hryniv, D. Kern and X. Mu.  
PAPERS *Optimal Control Applied to Native-Invasive Species Competition via a PDE Model*, submitted to Applied Mathematics and Computation, May 2011.
- WORK IN ○ Horst Behncke, Wandi Ding and Suzanne Lenhart.  
PROGRESS *Optimal Harvesting of Fish Populations with Age Structure*, 2011.
- W. Ding, R. Hendon, E. Lancaster, B. Cathey and R. Germick.  
*Discrete Time Optimal Control Applied to Pest Control Problems*, 2011.
- GRANTS ○ MTSU Instructional Evaluation and Development Grant, 2011, \$750.
- Faculty Research and Creative Activity Award, MTSU, August 2009 — May 2010, \$5,000.
- NSF STEP<sup>MT</sup> (Stepping Up Undergraduate Research) Summer Research, MTSU, June — July 2009, (team \$17,500), individual \$5,000.
- Faculty Research and Creative Activity Award, MTSU, August 2008 — May 2009, \$6,300.
- MTSU Distinguished Lecture Fund, 2009, 2010, 2011, \$2,500.
- Travel grants:
  - Society of Mathematical Biology (SMB) Travel grant, SMB, 2011, \$750.
  - Conference Board of the Mathematical Sciences (NSF-CBMS) Lecture Series travel funds, 2011.
  - Society of Industrial and Applied Mathematics (SIAM) Postdoc/Early Career Travel Award, SIAM-NSF, 2010, \$885.
  - Association of Women in Mathematics (AWM) Travel Grants for Women Researchers, AWM-NSF, 2009, \$1,488.
- SUBMITTED ○ PI, Elsevier Foundation New Scholars Program: Building and Sustaining a Middle TN Learning  
GRANTS Community for Women and Underrepresented Minorities in STEM, submitted August 2011, \$131,363.
- NOT FUNDED ○ MTSU Instructional Evaluation and Development Grant (IED), submitted April 2010, \$2,000.  
GRANTS
- Co-PI, NSF-PRISM: MT-Proactive Recruitment in science and mathematics (*PI: G. Rowell, other co-PIs: L. Green, R. Seipelt and Z. Sinkala*), submitted March 2010, \$2,625,862.
- PI, NSF-RUI: Optimal Harvesting of Fishery Models with Age and Spatial Structures, submitted January 2010, \$222,206.
- STUDENTS ○ Undergraduate Research  
SUPERVISION
  - Summer 2009: Cori Hendon, Evan Lancaster, Brandon Cathey and Robert Germick (high school senior) for NSF STEP<sup>MT</sup> Summer Research.
- PRESENTATIONS Invited Talks
  25. *The Third International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA III)*, San Antonio, TX, Oct. 2011. “Optimal Control Applied to Native-Invasive Species Competition via a PDE model.”

24. *2010 Society of Industrial and Applied Mathematics (SIAM) Conference on the Life Sciences*, Mini-symposium on Optimal Control Applied to Biological Systems, Pittsburgh, PA, July, 2010. “Optimal Control Applied to Native-Invasive Population Dynamics via a PDE Model.”
23. *The Second International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems*, Huntsville, AL, October, 2009. “Optimal Control for a Tick Disease Model Using Hybrid ODE Systems.”
22. *2009 Society of Industrial and Applied Mathematics (SIAM) Conference on Control and Its Applications*, Denver, CO, July, 2009. “Optimal Control for a Discrete Time Rabies Model on a Spatial Grid.”
21. *American Mathematical Society (AMS) regional conference*, Huntsville, AL, October, 2008. “Optimal Control of Growth Coefficient on a Steady State Population Model.”
20. *Special Session on Applied Partial Differential Equations at American Mathematical Society (AMS) Southeastern meeting*, Murfreesboro, TN, November, 3-4, 2007. “Optimal Harvesting of a Spatially Explicit Fishery Model.”
19. *Computational Science Workshop for Natural Resource Managers*, Knoxville, TN, April, 2007. “Rabies in Raccoons: Optimal Control for a Discrete Time Model on a Spatial Grid.”
18. *Association of Women in Mathematics (AWM) Workshop for Women Graduate Students and Recent PhDs*, New Orleans, LA, January, 2007. “Optimal Harvesting of a Semilinear Elliptic Fishery Model.”
17. *Society of Industrial and Applied Mathematics (SIAM) Annual Meeting*, Mini-symposium on Applications of Control in Biology, Boston, MA, July, 2006. “Optimal Harvesting of a Semilinear Fishery Model.”
16. *Computational Science Workshop for Natural Resource Managers*, Knoxville, TN, April, 2006. “Optimal Harvesting of a Semilinear Elliptic Logistic Fishery Model.”
15. *Society of Industrial and Applied Mathematics (SIAM) Annual Meeting*, Mini-symposium on Control of Systems with Hybrid Features, New Orleans, LA, July, 2005. “Optimal Control of Hybrid Systems Involving ODEs with Application for a Tick-borne Disease Model.”

#### Contributed Talks

14. *MTSU Department of Mathematical Sciences Seminar*, Murfreesboro, TN, April, 2009. “Optimal Control of Partial Differential Equations with Applications to Harvesting, Species Growth, & Native-Invasive Populations.”
13. *2008 Annual Mathematical Association of America (MAA) meeting* at Kentucky, Bowling Green, KY, March, 2008. “Optimal Control on Hybrid Tick Disease Model.”
12. *MTSU Department of Mathematical Sciences Colloquium*, Murfreesboro, TN, March, 2008. “Optimal Control on Hybrid Tick Disease Model.”
11. *the Joint Annual Meetings of the Society for Mathematical Biology and the Japanese Society for Mathematical Biology*, San Jose, CA, July 31-August 4, 2007. “Rabies in Raccoons: Optimal Control for a Discrete Time Model on a Spatial Grid.” **Served as the chair for the contributed session of Epidemiology II.**
10. *Joint Mathematics Meetings*, Contributed Session on Optimization and Control, San Antonio, TX, January, 2006. “Optimal Harvesting of a Semilinear Elliptic Fishery Model (preliminary report).”
9. *The 25<sup>th</sup> Annual Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE25)*, Dayton, OH, October, 2005. “Optimal Harvesting of a Semilinear Elliptic Fishery Model (preliminary report).”
8. *Joint Mathematics Meetings*, Contributed Session on Calculus of Variations, Atlanta, GA, January, 2005. “Optimal Control of Hybrid Systems Involving ODEs.”
7. *The 24<sup>th</sup> Annual Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE24)*, Chattanooga, TN, October, 2004. “Optimal Control of Hybrid Systems Involving ODEs (preliminary report).”

Posters

7. *Conference Board of the Mathematical Sciences (NSF-CBMS ) Lecture Series on Mathematical Epidemiology with Applications*, July 25-29, Johnson City, TN, 2011. “Optimal Control Applied to Native-Invasive Species Competition via a PDE Model.”
6. *2007 World Conference on Natural Resource Modeling*, Cape Cod, MA, June, 2007. “Optimal Harvesting of a Spatially Explicit Fishery Model.”
5. *Mathematical Biosciences Institute (MBI) Workshop for Young Researchers in Mathematical Biology*, Columbus, Ohio, March, 2007. “Optimal Harvesting of a Semilinear Elliptic Fishery Model.”
4. *Conference in Honor of Thomas I. Seidman - Advances in Control of Partial Differential Equations*, Baltimore, MA, October, 2006. “Optimal Harvesting of a Spatially Explicit Fishery Model.”
3. *Mathfest*, Knoxville, TN, August, 2006. “Optimal Harvesting of a Spatially Explicit Fishery Model.”
2. *Association of Women in Mathematics (AWM) Workshop for Women Graduate Students and Recent PhDs* New Orleans, LA, July, 2005. “Optimal Control of Hybrid Systems Involving ODEs.”
1. *Association of Women in Mathematics (AWM) Workshop for Women Graduate Students and Recent PhDs* Portland, OR, July, 2004. “Optimal Control of Hybrid Systems Involving ODEs (preliminary report).”

Conference Session Organized

- American Mathematical Society (**AMS**) Special Session at the Joint Mathematics Meetings: Control of Biological and Physical Systems, Boston January 2012. (Co-organize with S. Lenhart and V. Hryniv)

HONORS AND AWARDS ○ Travel Awards for AWM Workshops for Women Graduate Students and Recent PhDs, 2004, 2005 and 2007.

- President, Society of Industrial and Applied Mathematics (**SIAM**) Student Chapter, University of Tennessee, Knoxville, 2004 — 2006.
- Scholarly Activities Research Incentive Fund (SARIF), Summer 2004, University of Tennessee.
- Graduate Student Achievement Award, Department of Mathematics, University of Tennessee, Knoxville, Spring 2003.
- Science Alliance Fellowship, University of Tennessee & Oak Ridge National Laboratory (ORNL), 2001 — 2006.
- The Honorary Title of Excellent Graduate, Normal College of Qingdao University, China, July 1998.
- Scholarships for four consecutive years, Normal College of Qingdao University, 1994 — 1998.

PROFESSIONAL DEVELOPMENT ○ 5th Hands-on Workshop on Interrogating Cancer Resistance to Targeted Therapeutics with Systems Biology, The Center for Cancer Systems Biology at Vanderbilt University (**CCSB@V**), Nashville, TN, August 22-24, 2011.

- Conference Board of the Mathematical Sciences (**NSF-CBMS**) Lecture Series on Mathematical Epidemiology with Applications, July 25-29, Johnson City, TN, 2011.
- Univ. of Tennessee, Oak Ridge National Laboratory and Kentucky Biomedical Research Infrastructure (**UT-NRNL-KBRIN**) Bioinformatics summit 2010, Cadiz, KY, March 19-21, 2010.
- NUMB3R5 COUNT Workshop, **NIMBioS** ( National Institute for Mathematical and Biological Synthesis, **HHMI** ( Howard Hughes Medical Institute and **BioQUEST** Curriculum Consortium, May 2009.
- Leading Without Authority Workshop, American Chemical Society (**ACM**), MTSU, February, 2009.

- Mathematical Biosciences Institute (**MBI**) Workshop for Young Researchers in Mathematical Biology, Columbus, OH, March 2007.
- Best Practices in Teaching Program, The Graduate School, University of Tennessee, 2006 - 2007.
- Industrial Mathematical & Statistical Modeling (**IMSM**) workshop, North Carolina State University, July - August 2004.
- Joint Institute for Computational Science (**JICS**) workshop on Parallel Programming with MPI, University of Tennessee, May 2004.
- Mathematical Biological Complexity Short Course, University of Tennessee, July 2003.

MEMBERSHIPS ○ Society for Industrial and Applied Mathematics (**SIAM**)

- American Mathematical Society since (**AMS**)
- Society of Mathematical Biology (**SMB**)
- Mathematical Association of America (**MAA**)
- Association for Women in Mathematics (**AWM**)
- The Honor Society of Phi Kappa Phi ( $\Phi\kappa\Phi$ )
- Resource Modeling Association (**RMA**)
- Tennessee Academy of Science (**TAS**)

REFEREE

- Book
  - Pearson Education
- Journal
  - *Journal of Mathematical Analysis and Applications*
  - *Optimal Control Applications and Methods*
  - *Journal of Biological Systems*
  - *Natural Resource Modeling Journal*
  - *Journal of Biological Dynamics*
  - *Mathematical Methods in the Applied Sciences*
  - *International Journal of Biomathematics*

SERVICES

- **Professional Services**
  - Member of Association of Women in Mathematics (**AWM**) Student Chapter Committee 2009-12.
  - Reviewer for Tennessee Board of Regions (**TBR**) Diversity Research Grant, 2010.
  - President (2011-12), Vice President (2009-11) and Secretary (2008-09) for The Honor Society of **Phi Kappa Phi** MTSU Chapter.
  - Serve as a mentor in Association of Women in Mathematics (**AWM**) mentor network.
- **Public Services**
  - Member of MTSU Women in Science, Technology, Engineering and Mathematics Center (**WISTEM**) campus planning committee, since 2010.
  - Member of MTSU Expand Your Horizon (**EYH**) executive committee since 2008. Engage in helping middle and high school girls get interested in Science and Mathematics.
- **University Services**
  - **Department:**
    - Search Committee, 2011-12.
    - Faculty Advisor for **Pi Mu Epsilon** - Mathematics Honor Fraternity at MTSU, since 2011.
    - Undergraduate Program Review Committee, 2009-10.

- Biomathematics/statistics seminar organizer, since fall 2009.
- Calculus committee, 2010-11.
- McNair Program Liaison, 2008-11.
- Research & Scholarship Committee, 2007-11.
- Industrial Curriculum Group Committee, 2007-11.
- SCIENTIA Board of Faculty Facilitator, 2007-09.

• **College:**

- Member of the pre-Dissertation Committee for the Ph.D in Computational Science Program of: Awa Sisy 2011
- College of Basic and Applied Sciences (CBAS) Scholars' Day Committee, April 2011.
- Faculty for Interdisciplinary Ph.D. in Computational Science Program since Fall 2010.
- Member of Academic Appeals Subcommittee for the College of Basic and Applied Sciences 2008-10.

• **University:**

- Committee on Admissions and Standards, 2012-13.
- Faculty Development Committee, 2012-13.
- Library Committee, 2010-11.

COMPUTER SKILLS    ◦ MATLAB, MAPLE, Mathematica, C, Minitab, HTML, LaTeX, Microsoft Office.