Curriculum Vitae of Shangbing Ai

Personal Information:

Professor
Department of Mathematical Sciences
University of Alabama in Huntsville (UAH)
SC 258L (Office), 301 Sparkman Dr., Huntsville, AL 35899
Tel: (256)-824-2229, Email: ais@uah.edu

Education:

- **Ph.D. in Applied Mathematics, 1999**
  Dept. of Mathematics, University of Pittsburgh
  Supervisor: Prof. Stuart P. Hastings
  Thesis: Multi-pulse orbits for a singularly perturbed nearly integrable system

- **M.S. in Mathematics, 1987**
  Dept. of Mathematics, Shandong University, P.R. China
  Supervisor: Prof. Bingli You
  Thesis: Asymptotic behavior of a delay differential system

- **B.S. in Computational Mathematics, 1984**
  Dept. of Mathematics, Shandong University

Academic Experience:

9/87 – 5/93: **Lecturer,** Dept. of Mathematics, Shandong University
9/93 – 8/97: **GTA,** Dept. of Mathematics, University of Pittsburgh
9/98 – 5/00: **GTF,** Dept. of Mathematics, University of Pittsburgh
8/00 -- 5/02: **Postdoctoral fellow**, Center for Dynamical Systems and Nonlinear
         Studies, Georgia Institute of Technology
8/02 – 8/08: **Assistant professor**, Dept. of Mathematical Sciences, UAH
8/08 – 8/2020: **Associate professor**, Dept. of Mathematical Sciences, UAH
8/20 -- present: **Professor**, Dept. of Mathematical Sciences, UAH

Honors, Awards, and Fellowships

- Andrew-Mellon Predoctoral Fellowship, Univ. of Pittsburgh (09/97 - 05/98)
- Postdoctoral Fellowship, Georgia Institute of Technology (08/00 - 05/02)
- UAH Mini-Grant award (01/03 -12/03**)**: $8381.00

Research Interests:

**Ordinary and partial differential equations and dynamical systems
Functional differential equations and delay difference equations
Mathematical biology and applied mathematics**

- Traveling waves, periodic solutions, multi-pulse solutions, solitons arising in various mathematical models in population dynamics, combustions, chemical reactions, bioremediation, wound healing, epidemiology, skin pattern formation, competitions in chemostats, microelectromechanical and nanoelectromechanical systems, Ginzberg-Landau equations, quantum physics
- Layers, spikes and Morse indices for singularly perturbed differential equations
- Singular and regular perturbations, boundary value problems on finite and infinite intervals
- Asymptotic behavior for delay differential and delay difference equations
- Global solutions for some elliptic types of partial differential equations

Publications in Refereed Journals:

1. S. Ai, J. Li, J. Yu and B. Zheng, Stage-structured models for interactive wild and periodically and impulsively released sterile mosquitoes. Discrete & Continuous Dynamical Systems-B, 27 (2022), 2935-2957.
2. S. Ai and M. Fox, Four positive equilibria in a model for sterile and wide mosquito populations. Applied Math. Letter, 121 (2021), 107409.
3. S. Ai and Y. Yi, Relaxation oscillations in predator-prey systems. J. Dynamics and Differential Equations, 1-28 (2021). online March 2021, Dol: 10.1007/s10884-021-09980-6.
4. X. Hu, S. Fu and S. Ai, Global asymptotic behavior of solutions for a parabolic-parabolic-ode chemotaxis system modeling multiple sclerosis. Journal of Diff. Equations, 269 (2020), 6875–6898.
5. J. Li and S. Ai, Impulsive releases of sterile mosquitoes and interactive dynamics with time delay, J. Biological Dynamics, 14 (2020), 313-331.
6. S. Ai and S. Sadhu, The entry-exit theorem and relaxation oscillations in slow-fast planar systems. J. Diff. Equations, 268 (2020), 7220-7249.
7. S. Ai and C. Cowan, Critical elliptic equations via a dynamical systems approach, Nonlinear Analysis, 182 (2019), 97-112.
8. Liming Cai, S Ai, and Guihong Fan, Dynamics of delayed mosquitoes' populations models with two different strategies of releasing sterile mosquitoes Mathematical Biosciences and Engineering, 15 (2018), 1181-1202

9. S. Ai, Yihong Du and Peng Rui, Traveling wave solutions for a Holling-Tanner predator-prey model, J. Diff. Equations, 263 (2017), 7782 - 7814.

10. S. Ai and Craig Cowan, Perturbations of Lane-Emden and Hamilton-Jacobi equations I: the full space case, Nonlinear Analysis, 151 (2017), 227-251.

11. S. Ai and Craig Cowan, Perturbations of Lane–Emden and Hamilton–Jacobi equations II: Exterior domains, J. Diff. Equations, 260 (2016), 8025--8050.

12. S. Ai and Zhian Wang, Traveling Waves for the Keller-Siegel Model with Population Growth, Mathematical Biosciences and Engineering, 12 (2015), 717-737.

13. S. Ai, Wenzhang Huang and Zhian Wang, Traveling wave solutions to a chemotaxis system with logistic growth, Discrete and Continuous Dynamical Systems – Series B, 20 (2015), 1-21.

14. Liming Cai, S. Ai and Jia Li, Dynamics of mosquitoes populations with different strategies of releasing sterile mosquitos, SIAM, J. Appl. Math., 74 (2014), 1786-1809.

15. S. Ai and Reem Albashaireh, Traveling waves in spatial SIRS models, J. Dynam. Diff. Equations. 26 (2014), 143-164.

16. S. Ai, Jia Li and Juliang Lu, Mosquito-stage-structured malaria models and their global dynamics, SIAM *J. Appl. Math.,* **72** (2012), 1213-1237.

17. S. Ai, Self-similar solutions with fat tails for a nonlocal coagulation equation, Nonlinearity, 23 (2010), 579-587.

18. S. Ai, Traveling waves in a model of a fungal disease over a vineyard, SIAM. J. Math. Anal., 42 (2010), 833-856.

19. S. Ai, Spatially periodic patterns for nonlocal reaction-diffusion equations, Applicable Analysis, 89 (2010), 963-981.

20. S, Ai, Traveling waves in modeling of aerosolized skin grafts, Physica D: Nonlinear Phenomena, 237 (2008), 2761-2766.

21. S. Ai and John Pelesko, Dynamics of a canonical electrostatic MEMS/NEMS, J. Dynam. Diff. Eqns. 20 (2008), 609-641.

22. S. Ai, Traveling waves in a bioremediation model, SIAM J. Appl. Math. 68 (2007/2008), 680-693.

23. S. Ai, Global stability of equilibria in a tick-borne disease model, Math. Biosci. Eng. 4 (2007), 567-572.

24. S. Ai and Wenzhang Huang, Traveling wave fronts in combustion and chemical reaction models, Proc. Roy. Soc. Edinburgh Sect. A 137 (2007), 671-700.

25. S. Ai, Traveling wave fronts for generalized Fisher equations with spatial-temporal delays, J. Diff. Eqns. 232 (2007), 104-133.

26. S. Ai, Xinfu Chen and Stuart Hastings, Layers and spikes in non-homogeneous bistable reaction-diffusion equations, Trans. Amer. Math. Soc. 358 (2006), 3169- 3206.

27. S. Ai and Wenzhang Huang, Traveling waves for a reaction-diffusion system in   population dynamics and Epidemiology, Proc. Roy. Soc. Edinburgh Sect. A (2005), 663-676.

28. S. Ai, Homoclinic solutions to the Gray-Scott model, Appl. Math. Lett. 17 (2004), 1357-1361.

29. S. Ai, Multiple Positive Periodic Solutions for a delay host macroparasite model, Commun. Pure Appl. Anal. 3 (2004), 175-182.
30. S. Ai, Shui-Nee Chow and Yingfei Yi, Traveling wave solutions in a tissue interaction model for skin pattern formation, J. Dynam & Diff Eqns. 15 (2003), 517-534.
31. S. Ai, Existence of traveling wave solutions in a tissue interaction model for skin pattern formation, J. Nonlinear Sci. 13 (2003), 449-470.
32. S. Ai, Multi-bump solutions to Carrier's problem, J. Math. Anal. Appl. 277 (2003), 405-422.
33. S. Ai and Stuart Hastings, A shooting approach to layers and chaos in a forced Duffing equation, J. Diff. Eqns. 185 (2002), 389-436.
34. S. Ai, Multi-pulse like orbits for a singularly perturbed nearly-integrable system, J. Diff. Eqns. 179 (2002), 384-432.
35. S. Ai, Asymptotic formula for solutions of linear delay difference systems, J. Math. Anal. Appl. 264 (2001), 206-229.
36. S. Ai, Periodic Solutions in a model of competition between plasmid-bearing and plasmid-free organisms in a chemostat with an inhibitor, J. Math. Biol. 42 (2001), 71-94.
37. S. Ai and Xinfu Chen, Solitons of the two-dimensional 3-component gauged sigma model, J. Diff. Eqns. 153 (1999), 61-81.
38. S. Ai, Asymptotic integration of delay differential systems, J. Math. Anal. Appl. 165 (1992), 71-101.

Other Publications:

a. Traveling waves in a tissue interaction model for skin pattern formation, Young Faculty Research Proceedings, pp. 1-6, University of Alabama in Huntsville, 2003.
b. A solution to the problem 2000-3, Problem Section, Electronic J. Diff. Eqns, http://math.uc.edu/ode/20003/20003.html.
c. Criteria for asymptotic constancy of solutions of functional differential equations (in Chinese), "Selected Papers on Ordinary Differential Equations", pp. 256-262, Academic Press, Beijing, 1991.

Talks and Presentations:

1. Multi-pulse orbits for a singularly perturbed nearly integrable system, the fifth SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May, 1999.
2. Asymptotic formula for solutions of l^2-perturbed linear delay difference systems, Joint AMS Annual Meetings in Washington, DC, Jan. 2000.
3. Asymptotic formula for solutions of l^2-perturbed linear delay difference systems (two talks), Applied Mathematics Seminar, University of Pittsburgh.

4. Solitons of the 2-dimensional 3-component Gauged sigma model, Pacific Rim Dynamical Systems Conference Sponsored by SIAM, August, 2000.
5. Periodic solutions in a model of competition between plasmid-bearing and plasmid-free organisms in a chemostat with an inhibitor, Workshop on Biology and Differential Equations at Georgia Institute of Technology, Sept. 2000.
6. A shooting approach to layers and chaos in a forced Duffing equations (3 talks), CDSNS Seminar, Georgia Institute of Technology, Nov.2000.
7. A shooting approach to layers and chaos in a forced Duffing equation, Dixieland Analysis Seminar, Department of Math. At Emory University, Nov. 2000.
8. On multi-spike solutions to Carrier's problem, CDSNS Seminar, Georgia Institute of Technology, Feb., 2001.
9. Existence of traveling wave solutions in a tissue interaction model for skin pattern formation, Differential Equation Seminar, Dept. of Math at North Carolina State University, Nov. 1, 2001.
10. Existence of traveling wave solutions in a tissue interaction model for skin pattern formation}, Southeast-Atlantic Regional Conference on Differential Equations, Wake Forest University, Nov. 2, 2001.
11. Traveling wave solutions in a tissue interaction model for skin pattern formation, CDSNS Seminar, Georgia Institute of Technology, March, 2002.
12. Traveling wave solutions in a tissue interaction model for skin pattern formation, The Fourth International Conference on Dynamical Systems and Differential Equations, May 24-27, 2002, University of North Carolina at Wilmington, USA.
13. Spikes, layers and chaos for a Duffing equation, Applied Mathematics Meeting, University of Alabama at Birmingham, Oct. 27, 2002.
14. Multiple periodic solutions for a periodic delay equation, the 4th International Conference on Dynamical Systems and Applications, Morehouse College, May 22, 2003.
15. Multiple periodic solutions for a scalar differential equation with delays, Dept. of Mathematical Sciences, UAH, September 12, 2003.
16. Traveling waves for a reaction-diffusion system in population dynamics and epidemiology, Fourth World Congress of Nonlinear Analysts WCNA-2004, Orlando, Florida, July 6, 2004.
17. Layer and spikes in non-homogeneous bistable reaction-diffusion equations, First International Conference on Recent Advances in Bifurcation Theory and Applications of Dynamical Systems, Jinhua, China, Jun 10, 2005.
18. Traveling Wave Fronts in Combustion and Chemical Reaction Models, Twelfth International Conference on Statistics, Combinatorics, Mathematics and Applications at Auburn University, Dec. 3, 2005.
19. Traveling wave fronts for generalized Fisher equations with spatial-temporal delays, Fluids and Waves, Recent Trends in Applied Analysis, University of Memphis, May 11-13, 2006.
20. Dynamics of a Canonical Electrostatic MEMS/NEMS System, Department of Mathematical Sciences, UAH, September 8, 2006.
21. Traveling wave fronts in combustion and chemical reaction models, Dynamical systems seminar, Dept of Mathematics and Statistics, Boston University, November 20, 2006.

22. Traveling wave fronts in a bioremediation model, AMS 2007 Fall Southeastern Meeting at Middle Tennessee State University, Murfreesboro, TN, November 3, 2007.
23. Traveling wave solutions in a model of fungal disease, Department of Mathematical Sciences, UAH, September 19, 2008.
24. Traveling wave solutions in a model of fungal disease, AMS Fall Southeastern Meeting, Huntsville, Alabama, October 26, 2008.
25. Traveling wave solutions for a model of fungal disease, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 17-21, 2009.
26. Spatially periodic patterns for nonlocal reaction-diffusion equations, The Second International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems, October 9-11, 2009, UAH.
27. Traveling wave solutions for a model of fungal disease, DE Seminar at NC State University, Oct. 13, 2010.
28. Traveling wave solutions for a model of fungal disease, Applied math seminar, University of Pittsburgh, April 18, 2010.
29. Global dynamics for a malaria model, 36th Annual SIAM Southeastern Atlantic Section conference, University of Alabama in Huntsville, March 25, 2012.
30. Traveling waves in spatial SIRS models, Math colloquium at UAH, October, 2012.
31. Traveling Waves in a Spatial SIRS Model, invited talk at First International Conference on Dynamics of Differential Equations at Georgia Tech, March 17, 2013.
32. Dynamics of mosquitoes populations with different strategies of releasing sterile mosquitos, 33rd Southeastern-Atlantic Regional Conference on Differential Equations, Univ. of Tennessee, September 22, 2013.
33. Traveling Waves in a Spatial SIRS Model, Colloquium talk at Math. Dept. Columbus State Univ., Georgia, March 24, 2014.
34. Existence and stability of traveling wave solutions for a chemotaxis model, Spring AMS Southeastern Sectional Meeting, University of Alabama in Huntsville, AL, March 28, 2015.
35. Traveling waves in Reaction-Diffusion–Chemotaxis Models, Recent advances in reaction-diffusion equations and applications Jiangsu Normal University, Xuzhou, China, Jiangshu Normal University, Xuzhou, China. (May 23, 2015).
36. Traveling wave solutions for a predator-prey model, International Conference on Reaction-Diffusion Equations and their Applications to the Life, Social and Physical Sciences, May 26, 2016, The Institute of Mathematical Sciences (IMS) at the Renmin University of China in Beijing.
37. Traveling wave solutions for a predator-prey model, workshop on dynamical systems, Sichuan University, Chengdu, China, June 7, 2016.
38. Traveling wave solutions for a predator-prey model, the 10th International Conference on Recent Advances in Applied Dynamical Systems, Jiangsu Normal University, Xuzhou, Jiansu, China, June 10, 2016.
39. Travelling wave solutions for predator - prey models with delays, Twenty-Ninth Annual University of Alabama System, Applied Mathematics Meeting, University of Alabama, Tuscaloosa, Nov. 5, 2016.

40. Dynamics on interacting wild and sterile mosquitoes with different releasing strategies, Laboratory of Mathematical Parallel Systems, Department of Mathematics, York University, Canada, Oct. 17, 2016.
41. Dynamics on interacting wild and sterile mosquitoes with different releasing strategies, Alabama A & M University, Department of Mathematical Colloquium, Nov. 17, 2016.
42. Traveling wave solutions for a nonlocal diffusive predator-prey models. International Workshop on Nonlinear Analysis and Reaction-Diffusion Equations, Jiangsu University, Zhenjiang, China, June 4, 2017.
43. Traveling wave solutions for a nonlocal diffusive predator-prey models. The Eleventh International Conference on Recent Advances in Applied Dynamical Systems, Xi'an Jiaotong University, June 10, 2017.
44. Traveling wave solutions for a generalized Holing-Tanner predator-prey model. Workshop talk at Shaanxi Normal University, China, June 12, 2017.
45. Traveling wave solutions for a generalized Holing-Tanner predator-prey model. Colloquium talk at Shaanxi University of Science and Technology, China, June 12, 2017.
46. Dynamics on interacting wild and sterile mosquitoes with different releasing strategies. Symposium on qualitative theory and bifurcation theory of differential equations, Hua Qiao University, Quanzou, China, July 2, 2017.
47. Travelling wave solutions for nonlocal predator-prey models, 37th Southeastern-Atlantic Regional Conference on Differential Equations, Kennesaw State Uni.in Kennesaw, Georgia, Oct. 7-8, 2017.
48. Dynamics on interacting wild and sterile mosquitoes with different releasing strategies. Symposium on qualitative theory and bifurcation theory of differential equations, Hua Qiao University, Quanzou, China, July 2, 2017
49. Travelling wave solutions for nonlocal predator-prey models, 37th Southeastern-Atlantic Regional Conference on Differential Equations, Kennesaw State Uni.in Kennesaw, Georgia, Oct. 7-8, 2017.
50. Perturbations of Lane-Emden equation in the critical case, AMS Spring Southeastern Sectional Meeting, Vanderbilt University, Nashville, TN, April 15, 2018.
51. Traveling wave Solutions for broad classes of predator-prey systems with delays, Frontiers of Mathematical Biology: Modeling, Computation and Analysis, University of Central Florida, Orlando, FL, May 3, 2018.
52. Traveling Wave Solutions in a Chemotaxis Model with Nonlinear Chemical Gradients, Workshop on Applied Analysis, City University of Hong Kong, June 29, 2018.
53. Traveling Wave Solutions in a Chemotaxis Model with Nonlinear Chemical Gradients. Shandong University, China, July 19, 2018,
54. Entry-exit function and relaxation oscillations in slow-fast planar systems, AMS Spring Southeastern Sectional Meeting #1146, Auburn University, Auburn, AL, March 15-17, 2019.
55. The entry-exit function and relaxation oscillations in fast-slow systems. Workshop on Modeling Biological Phenomena by Parabolic PDEs and their Analysis, Renmin University, China, June 7, 2019.

56. The entry-exit function and relaxation oscillations in fast-slow systems. "The Thirteenth International Conference on Recent Advances in Applied Dynamical Systems" will be held at Hangzhou Normal University, Hangzhou, China, June 9. 2019.
57. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics and Statistics, Jiangsu Normal University, China, June 10, 2019.
58. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics, Southeast University, China, June 12, 2019.
59. Perturbation of Lane-Emden equation in the critical case. "International Workshop on Nonlinear Analysis and Reaction-Diffusion Equations", Harbin Normal University, Heilongjiang, China, June 16, 2019.
60. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics, Shanghai Normal University, China, June 24, 2019.
61. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics, Northwest Normal University, China, June 26, 2019.
62. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics, Lanzhou University, China, June 28, 2019.
63. The entry-exit function and relaxation oscillations in fast-slow systems. Seminar at the School of Mathematics, Fujian Normal University, China, July 1, 2019.
64. Perturbation of Lane-Emden equation in the critical case. Academy of Mathematics and Systems Science, Chinese Academy of Sciences, July 5, 2019.
65. Periodic solutions for a mathematical model with impulsive releases of sterile, Zoom talk, Center for Applied Mathematics, Guangzhou University, China, Sept. 22, 2020.
66. Periodic solutions for a mathematical model with impulsive releases of sterile, Zoom talk, Department of Mathematics, Xinyang Normal University, China, Jan. 19, 2021.
67. Relaxation oscillations in predator-prey systems, Colloquium talk on Zoom, University of Toledo, April 9, 2021.
68. Relaxation oscillations in predator-prey systems, seminar talk on Zoom, University of Toledo, April 27, 2021.
69. Relaxation oscillations in predator-prey systems, seminar talk on Zoom, Fujian Normal University, June 5, 2021.
70. Traveling wave solutions for multi-species predator-prey systems, Applied Mathematics Meeting, University of Alabama at Birmingham, Nov. 6, 2021.
71. Stage-structured models for interactive wild and periodically and impulsively released sterile mosquitoes. Zoom seminar talk, Center for Applied Mathematics, Guangzhou University, China, Dec. 20, 2021.

Mini-Grant Proposal at UAH (Awarded)

- Stability of Traveling wave fronts for a tissue interaction model on skin pattern formation, November 2002 (**funded** with $ 8381.00 from Jan. 2003 to Jan. 2004)

UAH Summers 2020 and 2021 RCEU Proposals

- Optimal Control and Numerical Bifurcation Analysis of Interactive Sterile and Wild Mosquitoes Populations (Joint with Dr. Pekker). **Summer 2020 (awarded).**
- Dynamics and Optimal Control in Epidemic Models. **Summer 2021 (awarded)**

Simons Foundation Grant Proposal:

- Relaxation Oscillations and Traveling Wave Solutions in Predator-Prey Systems. Submitted on Jan. 24, 2022.

Courses Taught at UAH (From Fall 2002 to present, 23 different courses):

1. MA 171: Calculus A, Spring 2003
2. MA 172: Calculus B, Fall 2003, Spring 2004
3. MA 201: Calculus C, Spring 2005
4. MA 238: Applied Diff. Eqns, Fall 2003, Fall 2005, Spring 2007, Fall 2009, Spring 2010, Spring 2013, Spring 2014, Spring 2015, Spring 2017, Spring 2018, Fall 2019, Spring 2020, Fall 2020, Spring 2021
5. MA 330: Foundation of Math, Spring 2005, Spring 2006, Summer 2008
6. MA 324: Applied Diff. Equations, Spring 2004
7. MA 452/502: Introduction to Real Analysis, Fall 2003, Fall 2004, Fall 2005, Spring 2022.
8. MA 458/508: Applied Linear Algebra, Summer 2003, Spring 2006, Fall 2006
9. MA 524: Dynamical Systems I, Fall 2002, Fall 2006, Fall 2009, Fall 2015, Fall 2016, Fall 2018
10. MA 538: Metric Spaces, Spring 2003, Spring 2013, Spring 2014
11. MA 624: Dynamical Systems II, Spring 2007, Spring 2010, Spring 2016, Spring 2017, Spring 2019
12. MA 656: Complex Analysis I, Summer 2007, summer 2011
13. MA 662: Asymptotics and Perturbation Theory, Summer 2006, summer 2010
14. MA 526: PDEs I, Fall 2007, Fall 2008, Fall 2012, Fall 2014, Summer 2021
15. MA 626: PDEs II, Spring 2007, Spring 2013
16. MA 456/506: Introduction to Applied PDEs, Spring 2008, Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022
17. MA 653: Real Analysis I, Fall 2008, Fall 2011, Fall 2014, Fall 2016
18. MA 654: Real Analysis II, Spring 2009, Spring 2012, Spring 2015
19. MA 726: Theory of PDEs, Summer 2009, Fall 2019
20. MA 453/503: Intro to Complex Analysis, Fall 2012, Fall 2017, Fall 2020, Spring 2021
21. MA/PH 607: Mathematical Physics, Fall 2015
22. MA/PH 609: Mathematical Physics, Spring 2016
23. MA 460/561: Introduction to Fourier Analysis, Fall 2017

24. Hon 499: Honor Thesis, Fall 2020.
25. MA 244: Intro to Linear Algebra, Spring 2020
26. MA 690: Reaction-Diffusion Equations and Their Applications, Spring 2022.

Courses Taught (From Fall 1999 to Spring 2002):

- Business Calculus, Fall 1999, Spring 2000, Univ. of Pittsburgh
- Calculus III, Fall 2000, Fall 2001, Georgia Tech.
- Calculus III for CS majors, Spring 2001, Georgia Tech.

Courses Taught at Shandong University (From Fall 1987 to Spring 1993):

- Calculus; Linear Algebra; Mathematical Analysis; Ordinary Differential Equations; Partial Differential Equations; Lyapunov Stability Theory

Ph.D Students Supervised:

- Reem Albashaireh, UAH (graduated in May 2015). Thesis title: Traveling wave solutions in a chemotaxis model: existence and stability.

Undergraduate Students Supervising:

- Maxwell Fox. I supervised his UAH summer 2020 RECU project during the summer 2020 (10 weeks). I supervised Maxwell for his Honors Capstone thesis in the fall semester 2020 and spring semester 2021.
- Alexandra Fadrigo. I supervised Ms. Fadrigo for her research in mathematical biology in the fall semester 2020 and spring semester 2021.

Services to the Department of Mathematical Sciences, College of Sciences and UAH:
- Colloquium Coordinator: 2004 - 2008, 2014 – present.   Library Liaison: 2005-present.
- Member/Chair of Real Analysis Exam Committee for University of Alabama Joint Ph.D. Program Exam: May 2010, Sept. 2012 (Chair), Sept. 2013 (Chair), May 2014 (Chair), May 2015, Sept. 2015, Sept. 2017 (Chair), Sept. 2018, May 2020 (Chair), May. 2022.
- Member/Chair for 13 Departmental Reappointment Committees: 2008, 10, 14, 15,

17, 2021, 2022
- Member of Tenure-Track Faculty Search Committee, 2014, 2022.
- Member of Department Chair Search Committee, 2017.
- Alternate Member of Promotion and Tenure Advisory Committee (PTAC), 2011.
- Member/Chair for 5 PTAC Committees, November 2016, May 2017.
- Faculty Senator: 2005 - 2008, 2017 - present.
- Member of Scholastic Affairs Committee: 2005 - 2008.
- Member of Governance and Senate Operation Committee: 2017 Spring - present.
- Graduate Student Admission Committee for Math Dept.: Fall, 2018-2021.
- Member/Chair of Promotion and Tenure and Lecture Advisory Committee. 2020
- Member/Chair of Reappointment Committee. 2021, 2022

Conferences organized:

- Co-organize (with Wenzhang Huang and Weishi Liu) a special session on AMS Spring Southeastern Sectional Meeting, Meeting number 1044, University of Alabama in Huntsville, Huntsville, AL, October 24-26, 2008. Session title: Dynamics and applications of differential equations.
- Co-organize (with Wenzhang Huang) a special session on AMS Spring Southeastern Sectional Meeting, Meeting number 1109, University of Alabama in Huntsville, Huntsville, AL, March 27-29, 2015. Session title: Advances in the theory and applications of dynamical systems and applications.