CURRICULUM VITAE

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EDUCATION

- Ph.D., Mathematics, University of Houston, Houston, Texas, 2002
  Dissertation: *Computation of Bifurcating Rotating Waves For The Fitzhugh-Nagumo Equations On Circular Domains of One and Two Dimensions*, Advisor: Dr. Giles Auchmuty
- M.S., Applied Mathematics, University of Houston, Houston, Texas, 1993
- B.S., Physics, University of California, Los Angeles, California, 1987

EXPERIENCE

- *Assistant Professor of Mathematics*, Sam Houston State University, 2006-present
- *VIGRE (Vertical Integration of Research and Education) Postdoctoral Fellow*, Tulane University, 2003-2006
- *Community College Mathematics Instructor*, San Jacinto Community College, 1994-2003
- *High School Mathematics Teacher*, Alvin Senior High School, 1993-1994
- *Teaching Fellow*, University of Houston, 1992-1993
- *Software Systems Engineer*, CAE Link Flight Simulation, 1988-1990 and Eagle Technical Services, 1990-1991

RESEARCH INTERESTS

- In general, I am interested in the modeling and simulation of problems from mathematical biology. In particular, I create and analyze nonlinear dynamical models (differential equations) of biological systems in ecology and physiology that involve time and/or space dependent behavior. The objective of my research is to better understand and predict complex biological phenomena using (when possible) computationally tractable mathematical models.

PUBLICATIONS

- William I. Lutterschmidt, John G. Alford, Curtis Balusek, Kristen Bowers, and Casey Hartnett, *A Quantitative Analyses of a Theoretical Benefit-Cost Model of Behavioral Thermoregulation: Huey and Slatkin Revisited*, in preparation.
- John G. Alford, *Eradication of the Screwworm Fly By Sterile Fly Release Method*, in preparation.
- John G. Alford, Curtis Balusek, Kristen Bowers, and Casey Hartnett *A Mathematical Model of Biocontrol of Invasive Aquatic Weeds*, submitted to the journal Involve and under review.
- John. G. Alford, *Reaction Diffusion Models of Threshold and Waveblock in Heterogeneous Excitable Media*, Applied Mathematics and Computation, Elsevier Inc., DOI: 10.1016/j.amc.2011.12.092, in press and to appear in 2012.
- John G. Alford and William I. Lutterschmidt *Modeling Energetic and Theoretical Costs of Thermoregulatory Strategy*, The Journal of Biological Dynamics, Taylor and Francis, 2011.
- John G. Alford, *Synchrony and Spontaneous Order*, Encyclopedia of Mathematics and Society, Eds. Sarah J. Greenwald and Jill E. Thomley, Salem Press, October 2011.
- John G. Alford, *Models of Unidirectional Propagation in Heterogeneous Excitable Media*, Applied Mathematics and Computation, Vol. 216, No. 4, 2010.
- John G. Alford, *Bifurcation Structure of Rotating Wave Solutions of the FitzHugh-Nagumo Equations*, Communications in Nonlinear Science and Numerical Simulations, Vol. 14, No. 8, 2009.
- John G. Alford, Giles Auchmuty, *Rotating Wave Solutions of the FitzHugh-Nagumo Equations*, Journal of Math Biology, Vol. 53, No. 5, Springer Berlin/Heidelberg 2006.
- John Alford, Nick Cogan, Charles Miller, Seth Patinkin, Bradford E. Peercy, Noah Rosenburg. *Boundary Element Analysis of Intracardiac Electrogram Sensing*, IMA Preprint Series #1589-3, October, 1998.

HONORS, GRANTS, AND AWARDS

- *VIGRE (Vertical Integration of Research and Education) Postdoctoral Fellow*, Tulane University, 2003-2006
- Principle Investigator with William I. Lutterschmidt for a Sam Houston State University Faculty Research Grant, awarded $5000 for research on mathematical model of movement for a thermoregulating ectotherm, Summer 2010.
- Recognized by former students and the Office of the Vice President of Student Services at Sam Houston State University for contributing to student success and development, Spring 2010 and Spring 2011.

RECENT PRESENTATIONS

(Oral) *The Snake, the Fish, and the LURE*, Symposium on Biomathematics and Ecology: Education and Research, Portland, Oregon, December 18, 2011.

(Oral) *Models of Unidirectional Propagation in Heterogeneous Excitable Media*, SIAM Conference on Applications of Dynamical Systems, Contributed Paper Session on Cardiac Modelling, Snowbird, Utah, May 26, 2011.

(Oral) *Modeling Energetic and Theoretical Costs of Thermoregulatory Strategy* , Joint Mathematics Meetings of AMS/MAA, AMS Contributed Paper Session on Mathematical Biology and Ecology, New Orleans, Louisiana, January 8, 2011.

(Oral) *Non-Constant Steady-States and Waves in Inhomogeneous Excitable Media*, Applied Mathematics Seminar, Sam Houston State University, Huntsville, Texas, November 31, 2010.

(Poster) *Modeling Energetic and Theoretical Costs of Thermoregulatory Strategy*, The 10th Red Raider Mini-Symposium, Mathematical Modeling in Population Biology and Epidemiology, Texas Tech University, Lubbock, Texas, October 29, 2010.

(Oral) *Mathematical Model of a Thermoregulating Ectotherm*, Sam Houston State University Department Colloquium, Huntsville, Texas, April 22, 2010.

(Oral) *Mathematical Model of the Movements of a Thermoregulating Ectotherm*, Texas Section of the MAA, Abilene Christian University, Abilene, Texas, April 9, 2010.

(Oral) *Modeling the Movements of a Thermoregulating Timber Rattlesnake (Crotalus Horridus)* , Joint Mathematics Meetings of AMS/MAA, AMS Special Session on Biomathematics: Modeling in Biology, Ecology, and Epidemiology, San Francisco, California January 15, 2010.

TEACHING AND ADVISING

- Classes I Have Taught
  - High School Algebra and Geometry
  - Pre-Algebra (Developmental Mathematics) (Math 0304)
  - Introductory Algebra (Developmental Mathematics) (Math 0305)
  - Intermediate Algebra (Developmental Mathematics) (Math 0306)
  - College Algebra (Math 1314)
  - Plane Trigonometry (Math 1316)
  - Mathematics for Managerial Decision Making I (Math 1324)
  - College Mathematics (Math 1332)
  - Elementary Statistics (Math 1369)
  - Calculus I (Math 1420)
  - Calculus II (Math 1430)
  - Calculus Survey (Math 2399)
  - Calculus III (Math 2440)

- Differential Equations (Math 3376)
- Introduction to Linear Algebra and Matrices (Math 3377)
- Numerical Methods (Math 3394)
- Topics in Applied Mathematics I (Math 4376)
- Scientific Computation (MATH 6394)

- Students I Have Advised

  - Graduate Thesis Advisor with Alacia Voth, Sam Houston State University; Thesis Title: *The Exploration and Computations of Mathematical Models of Intermittent Treatment for Prostate Cancer*, Fall 2011 - Current.
  - Graduate Research Advisor with Laura Bruhn, Sam Houston State University; Project Title: *Mathematical Model of Small Amplitude Vocal Fold Oscillation*, Fall 2010 and Spring 2011.
  - Undergraduate Research Advisor with Curtis Balusek, Kristen Bowers, and Casey Hartnett, Sam Houston State University LURE (Longterm Undergraduate Research Experience); Project Titles: *A Mathematical Model of Biocontrol of Invasive Aquatic Weeds* and *Optimal Movement Strategies for Thermoregulating Snakes and Lizards within a Habitat*, 2009-2010.
  - Undergraduate Research Advisor with Stefanie Meyer, Sam Houston State University; Honor's Thesis Title: *A Finite Difference Model of Flute Dynamics*, Fall 2007 and Spring 2008.
  - Undergraduate Research Advisor with Owen Lewis, Ruben Arenas, Greg Drugan, Johnny Feng, Rafael Embid, Priya Boindala, Tulane University REU (Research Experience for Undergraduates); Project Title: *Reaction Diffusion Equations: The Search For Non-Constant Stable Steady-States*, Summer 2004.
  - Faculty Sponsor for Greg Drugan, Publication Title: *Non-constant Stable Solutions to Reaction-Diffusion Equations in Star-Shaped Domains*, Rose-Hulman Institute of Technology Undergraduate Math Journal, Volume 6, Issue 2, 2005.
  - Undergraduate Research Advisor with Mark Reppell, Tulane State University; Honor's Thesis Title: *The Importance and Evolution of Invasive Species Modeling*, Spring 2006.

RECENT SERVICE ACTIVITIES

- Departmental Service

  - Honors Awards Committee, Spring 2011
  - Merit Review Committee, Spring 2011
  - Course Prerequisite Review Committee, Fall 2010
  - Math 1420 Textbook Selection Committee, Spring 2010
  - Advisor for Pi Mu Epsilon, Texas Epsilon Chapter, Spring 2008-present

- College Service

  - Co-advisor to Chas Stephens, Biology 5095, Special Graduate Topics in Biology, Fall 2010

- University Service
  - SHSU FLASH mentor to Randy Laran (music major), Spring 2010
- Professional Service
  - Manuscript Review
    - Journal of Applied Mathematics, 2011
    - IEEE Transactions on Neural Networks, 2011
  - Textbook Review
    - John M. Davis, An Introduction to Partial Differential Equations, First Edition, W.H. Freeman & Co., 2011
- Community Service
  - Delivered Christmas gifts to children of incarcerated parents for The Woodlands United Methodist Church, Missions Ministry, 2011

MEMBERSHIPS (CURRENT AND FORMER)

- SIAM (Society for Industrial and Applied Mathematics) (current)
- Society for Mathematical Biology (SMB) (current)
- American Mathematical Society (AMS) (former)
- Mathematical Association of America (MAA) (former)
- Sigma Xi, The Scientific Research Society (current)
- Sigma Pi Sigma, Society of Physics Students (current)
- BioSIGMAA: Special Interest Groups of the Mathematical Association of American, Mathematical and Computational Biology (former)