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

- Associate 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 (discrete and continuous) of biological systems in ecology and physiology that involve time and/or space dependent behavior. The objective of my research is to understand and predict complex biological phenomena using simulations and (when possible) computationally tractable mathematical models.

PUBLICATIONS

- William I. Lutterschmidt, John G. Alford Costs and Benefits of Lizard Thermoregulation Revisited: From Conceptual to Computational Models, in preparation.
- John G. Alford, Alacia Voth, Edward Swim Mathematical Modeling of Continuous and Intermittent Androgen Suppression for the Treatment of Advanced Prostate Cancer, Mathematical Biosciences and Engineering, Volume 14, Number 3, June 2017, pp. 777-804, doi:10.3934/mbe.2017043.
- John G. Alford A reaction diffusion model of the Darien Gap Sterile Insect Release Method. Communications in Nonlinear Science and Numerical Simulations, Vol. 22, No. 1-3, May 2015, Pages 175-185.
- John G. Alford, The Virtual Reptile: Mathematical Models and Simulations of Thermoregulatory Strategy, Chapter 11, Reptiles in Research: Investigations of Ecology, Physiology, and Behavior from Desert to Sea, Editor: William I. Lutterschmidt, Published by Nova Science Publishers, Inc., 2013
- John. G. Alford, Curtis Balusek, Kristen Bowers, and Casey Hartnett, A Mathematical Model of Biocontrol of Invasive Aquatic Weeds, Involve, Vol. 5, No. 4, pp. 431-447, June 2013.
- John. G. Alford, Reaction Diffusion Models of Threshold and Waveblock in Heterogeneous Excitable Media, Applied Mathematics and Computation, Vol. 218, No. 13, 2012.
- John G. Alford and William I. Lutterschmidt *Modeling Energetic and Theoretical Costs of Thermoregulatory Strategy*, The Journal of Biological Dynamics 6(1)63-79, 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

- (2016) Sam Houston State University Center for Enhancing Undergraduate Research Experiences and Creative Activities (EURECA) Faculty and Student Team (FAST) award (\$10,000); Linking hydrology to the abundance and distribution of the blue crab (Callinectes sapidus) in a complex coastal ecosystem; with Dr. Edward Swim, and Dr. Jeffrey Wozniak.
- (2013) National Science Foundation, Division of Mathematical Sciences award (\$15,833); *RUI: Unsolicited WPMS Enhancing Career Opportunities Integrative Mathematical Program* for Analyzing Coastal Systems (DMS-1247985); with Dr. William I. Lutterschmidt, Dr. Edward Swim, and Dr. Jeffrey Wozniak.
- (2010) Faculty Research Grant award (\$5000); *Mechanistic Movement Models of Thermoregulating Ectotherms*; with Dr. William I. Lutterschmidt.
- (2003-2006) NSF VIGRE (Vertical Integration of Research and Education) Postdoctoral Fellowship at Tulane University.

TEACHING AND ADVISING

- Courses 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)
 - Statistical Methods in Practice (Math 3379)
 - Numerical Methods (Math 3394)
 - Introductory Analysis (Math 4361)

- Elementary Analysis (Math 4366)
- Topics in Applied Mathematics I (Math 4376)
- Foundations of Applied Mathematics (Math 5376)
- Numerical Linear Algebra (Math 6368)
- Special Topics in Mathematical Biology (MATH 6394)
- Sample of Former and Current Research Advising Activities
 - Co-adviser (with Dr. Ed Swim) for Sam Houston State University Department of Mathematics and Statistics Research Experience For Undergraduates during Summer 2015 (four students) and Summer 2016 (six students).
 - Co-adviser (with Dr. Ed Swim) for Casey Hartnett's Practicum, Application of Feature Detection and Statistics in Target Analysis, Spring 2014.
 - Co-adviser (with Drs. Ed Swim and Jeffrey Wozniak) for ECO-IMPACS (Enhancing Career Opportunities Integrative Mathematical Program for Analyzing Coastal Systems) undergraduate/graduate research experience at SHSU during Summer 2013. We worked with two undergraduate mathematics students, two undergraduate biology students, and one graduate mathematics student as they used mathematical modeling to investigate problems in conservation biology and environmental science.
 - 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, Spring 2012.
 - 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

- Undergraduate Mathematics Coordinator, Department of Mathematics and Statistics
- Math department coordinator for Math 1314 (Pre-Calculus Algebra)
- Undergraduate course advising for mathematics majors and minors
- EURECA (Enhancing Undergraduate Research Experiences and Creative Activities) Advisory Council
- Honors committee and Pi Mu Epsilon chapter adviser at SHSU (since 2006)
- Hiring committee (2016)
- Calculus Placement Exam Committee
- Manuscript reviewer for various mathematics journals including *Proceedings for the National* Conference on Undergraduate Research, Communications in Nonlinear Science and Numerical Simulation and Applied Mathematical Modelling

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)