

CURRICULUM VITAE

JOHN G. ALFORD

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EDUCATION

Doctor of Philosophy, Mathematics, University of Houston, Houston, Texas, 2002

Master of Science, Mathematics, University of Houston, Houston, Texas, 1993

Bachelor of Science, Physics, University of California, Los Angeles, California, 1987

RESEARCH

My research is in modeling, simulation, and computation with nonlinear reaction-diffusion equations applied to biological systems. Typically these systems depend on parameters such as diffusion, stimuli, or domain size and one would like to determine how the parameters affect solutions. I utilize both numerical and analytical methods to investigate parameter dependence by approximating solutions, computing stability properties, and analyzing bifurcation behavior. My interests include both physiological and ecological phenomena which exhibit oscillations, traveling waves, and non-homogeneous stationary solutions over a wide range of length and time scales.

PUBLICATIONS

- John G. Alford, Giles Auchmuty, "Rotating Wave Solutions of the FitzHugh-Nagumo Equations", *Journal of Math Biology*, in print
- John G. Alford, "Effects of Diffusion and Stimuli on Bifurcating Rotating Waves in Excitable Media", in review at *Proceedings of The Royal Society, Series A*
- John G. Alford, Robert Matlock, "Eradication of the Screwworm Fly By Sterile Fly Release Method", in process
- John Alford, Nick Cogan, Charles Miller, Seth Patinkin, Bradford E. Peercy, Noah Rosenburg, "Boundary Element Analysis of Intracardiac Electrogram Sensing", *IMA Preprint Series #1589*, August 1998

ACADEMIC/TEACHING EXPERIENCE

VIGRE Postdoctoral Fellow, Tulane University, *2003-present*

participate in all aspects of VIGRE (*vertical integration of research and education*):

- teach undergraduate and graduate students
- coordinator for an undergraduate class in ordinary differential equations
- coordinator for a weekly applied mathematics seminar
- co-lead a summer REU program in applied mathematics
- design and teach a graduate class in mathematical biology

Mathematics Instructor, San Jacinto Community College, *1994-2003*

- teach undergraduate students
- coordinator for various remedial mathematics courses
- serve on various committees including acting as committee chairperson

Mathematics Teacher, Alvin Senior High School, *1993-1994*

Teaching Fellow, University of Houston, *1992-1993*

COURSES TAUGHT

- mathematical biology (graduate/undergraduate)
- partial differential equations (graduate/undergraduate)
- ordinary differential equations
- calculus I, II, III
- pre-calculus, finite mathematics, mathematics for liberal arts, and remedial mathematics

COURSES DEVELOPED

Introduction to Mathematical Biology

An interdisciplinary class for students in applied mathematics, biology, and biomedical engineering which involved analyzing, simulating, and modeling with differential equations from mathematical biology; the dynamical systems software *XPPAUT* was used for research and discovery and students were required to complete a final project with an oral presentation.

INDUSTRIAL EXPERIENCE

Software Systems Engineer, CAE Link Flight Simulation, 1988-1990

Software Systems Engineer, Eagle Technical Services, 1990-1991

- design, code, test, and debug software in military flight simulators and the space station

SERVICE

- reviewer for *International Journal of Mathematical and Computer Modelling*
- co-organized mini-symposium titled *Reaction-Diffusion Equations in Mathematical Biology*, SIAM annual meeting, New Orleans, LA, July 2005
- organized weekly VIGRE seminars in applied mathematics
- committees chaired and/or served on include textbook selection, student success and recruitment, district-wide remedial final exam creation and evaluation, district-wide remedial program evaluation
- faculty sponsor for ROTARACT (rotary-sponsored service club for students ages 18 to 30)

TALKS

- SEARCDE25, October 2005
- SIAM annual meetings, July 2005
- AMS sectional meeting #1006, April 2005
- SIAM Life Sciences conference, July 2004
- Tulane University (three talks), 2003-2004
- SEARCDE, October 2003
- Mathematical Modelling in Industry - A Workshop for Graduate Students at the IMA, July 1998

HONORS AND MEMBERSHIPS

- VIGRE postdoctoral fellowship, Tulane University, 2003-present
- teaching fellowship, University of Houston, 1992-1993
- Society for Industrial and Applied Mathematics (SIAM)
- Mathematical Association of America (MAA)
- Sigma Pi Sigma, Society of Physics Students
- Sigma Xi, The Scientific Research Society