

# John R. Samuels, Jr.

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## Education

**North Carolina State University**, Raleigh, NC

- ◇ Ph.D. in Applied Mathematics, expected June 2008
  - Thesis title: *Propagation of Shear Waves in Three Dimensional Biotissue: An Internal Variable Approach*
  - **3.96 GPA**, Summa Cum Laude distinction (expected)
- ◇ MS. in Applied Mathematics, December 2005
  - **3.89 GPA**, Summa Cum Laude distinction

**Honors College at Florida Atlantic University**, Jupiter, FL

- ◇ B.A. in Mathematics, May 2003
  - Senior Thesis title: *Fractal Dimension: An Analysis of Different Definitions*
  - **3.775 GPA**, Magna Cum Laude distinction

## Work

Experience:

8/04 - present

**Graduate Research Assistant**, North Carolina State University

2004 - present

Advisor: Dr. H.T. Banks

- ◇ Modeled three dimensional acoustic wave propagation in biological tissue generated by coronary stenosis. Analyzed noisy data by utilizing inverse problem techniques to quickly and accurately detect location of coronary stenosis.
- ◇ Formulated a physics based polymer model that incorporates viscoelasticity. This research effort is one component of a multi-year investigation of polymer behavior from the phenomenological level to the nano, or bead level.
- ◇ Collaborated with multi-disciplinary group to develop a social network model. The model was an initial effort to describe how social networks, such as terrorist organizations or HIV populations, evolve over time.
- ◇ Researched statistical techniques in inverse problem methodology to analyze noisy data and determine accuracy of estimates.

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- Work Experience:** 8/99 - 8/04
- Teaching Assistant**, North Carolina State University  
2003 - 2004
- ◇ Instructed calculus material to undergraduate students.
- Private Tutor**, Jupiter, FL and Raleigh, NC  
1999 - present
- ◇ Taught high school and college level mathematics to students on an individual basis.
- Computer Skills**
- Languages: Fortran, Matlab, Maple, Visual Basic, C++  
Platforms : Windows, Linux, Unix  
Software : Matlab, Maple, Latex, Microsoft Office
- Awards**
- ◇ Recipient of the GAANN Fellowship: Preparing the Professoriate, August 2006
  - ◇ Awarded a SAMSI Fellowship, August 2004
  - ◇ Named "Honors College Student of the Year", May 2000
- Related Classes**
- Dynamic Systems and Multivariable Control, Mathematical and Experimental Modeling, Numerical Analysis, Linear Algebra, Partial Differential Equations, Nonlinear Equations and Unconstrained Optimization, Finite Difference and Finite Elements Methods, Statistical Theory
- Publications**
- H. T. Banks, N. S. Luke, and J. R. Samuels, Jr., *Viscoelasticity in Polymers: Phenomenological to Molecular Mathematical Modelling*, Numerical Methods for Partial Differential Equations, Volume 23, Issue 4, pp 817-831, April 2007.
- H. T. Banks, J. B. Hood, N. G. Medhin, and J. R. Samuels, Jr., *A Stick-Slip/Rouse Hybrid Model for Viscoelasticity in Polymers*, Nonlinear Analysis: Real World Applications, to appear.
- H. T. Banks, A. F. Karr, H. K. Nguyen, and J. R. Samuels, Jr., *Sensitivity to Noise Variance in a Social Network Dynamics Model*, Quarterly of Applied Mathematics, to appear.

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## Talks

*Propagation of Shear Waves in Biotissue: A Comparison of the Ordinary and Generalized Least Squares Algorithms*, Atlantic Coast Conference on Mathematics in the Life and Biological Sciences, Illinois Institute of Technology, Blacksburg, VA, May 3 - 5, 2007

*Development of a Physics Based Polymer Model*, BICOM: The Brunel Institute of Computational Mathematics, MAFELAP 2006, Uxbridge, England, June 13 - 16, 2006

*Development of a Social Network Model*, SAMSI, Research Triangle Park, NC, May 19-21, 2005

## Interests

I enjoy filming and editing home movies. Also, I both love water skiing, ski tubing and tarpon fishing at our family's home in the Florida Keys.

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November 17, 2007