

Zackary Roman Kenz

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United States Citizen

- EDUCATION ◇ **North Carolina State University**, Raleigh, NC
- *Ph.D. in Applied Mathematics*, with a concentration in Computational Mathematics, anticipated May 2013
 - Advisor: H.T. Banks
 - Ph.D. Qualifying Exams: Analysis, Systems and Control, Numerical Analysis
 - *Masters in Applied Mathematics*, concentration in Computational Mathematics, May 2011
- ◇ **Concordia College**, Moorhead, MN
- *B.A. in Mathematics and Computer Science*, Economics minor, summa cum laude, May 2008
- RESEARCH INTERESTS Computational mathematics: inverse problem methodology, mathematical modeling, nonlinear filtering, signal processing, control theory, elasticity theory and its applications
- SUPPORT **Graduate Assistance in Areas of National Need (GAANN) Fellowship, Computational Science**, North Carolina State University, Fall 2008 - present
- MEMBERSHIPS ◇ Society for Industrial and Applied Mathematics, Aug 2008-present
- ◇ Omicron Delta Epsilon National Economics Honor Society, inducted spring 2008
 - ◇ Omicron Delta Kappa National Leadership Honor Society, inducted spring 2006
- PUBLICATIONS H.T. Banks, S. Hu, and Z.R. Kenz, A Brief Review of Elasticity and Viscoelasticity for Solids, *Advances in Applied Mathematics and Mechanics*, Vol. 3.1 (2011) 1-51. CRSC Technical Report TR-10-08, North Carolina State University (May 2010).
- H.T. Banks, S. Hu, Z.R. Kenz, and H.T. Tran, A Comparison of Nonlinear Filtering Approaches in the Context of an HIV Model, *Mathematical Biosciences and Engineering*, Vol. 7.2 (2010) 213-236. CRSC Technical Report TR-09-16, North Carolina State University (Jul 2009).
- D.R. Anderson and Z.R. Kenz, Global asymptotic behavior for delay dynamic equations, *Nonlinear Analysis*, Vol. 66 (2007) 1633-1644.
- ADDITIONAL WORKS J. Dolloff, Z.R. Kenz, J. Rische, D.A. Rogers, L. Smith, and E. Mosteig, *Algebraic Interleavers in Turbo Codes*, Department of Mathematics Technical Report, Applied Mathematical Sciences Summer Institute, California State Polytechnic Institute, Pomona and Loyola Marymount University (Aug 2006).

- TALKS,
POSTERS,
CONFERENCES
11. The Young Investigators International Workshop, Invited talk, *Measure estimation methods for distributed parameters in dynamical systems–Part II*, Rouen, France, 4-6 Apr 2011
 10. Workshop on Future Directions in Applied Mathematics, North Carolina State University, Raleigh, NC, 10-11 Mar, 2011, attended
 9. Concordia Pi Mu Epsilon Math Club, Discussion, *The Math Graduate School Experience*, Concordia College, Moorhead, MN, 8 Oct 2010
 8. Math/CS Colloquium Series, Invited talk, *Finding Buried Targets Using Acoustic Excitation*, Concordia College, Moorhead, MN, 7 Oct 2010
 7. Southeastern-Atlantic Regional Conference on Differential Equations, Contributed talk, *Acoustic Excitation of Buried Targets*, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1 Oct 2010
 6. Applied Mathematics Graduate Student Seminar, North Carolina State University, Raleigh, NC
26 Sept 2011, *Distributions on Electric Permittivity in Maxwell's Equations*
13 Sept 2010, *Acoustic Excitation of Buried Targets*
31 Aug 2009, *A Comparison of Nonlinear Filtering Approaches in the Context of an HIV Model*
 5. SIAM Conference on Control and its Applications, Modeling and Control of Distributed Parameter Systems minisymposium, Invited talk, *A Comparison of Nonlinear Filtering Approaches in the Context of an HIV Model*, Denver, CO, 7 Jul 2009
 4. Mathematics on the Northern Plains, Contributed talk, *Global Asymptotic Behavior for Delay Dynamic Equations*, North Dakota State University, Fargo, ND, 26 Apr 2008
 3. Joint Mathematics Meetings, San Diego, CA, Jan 2008, attended
 2. Great Plains Technology Conference, Fargo, ND, Oct 2007, attended
 1. *Algebraic Interleavers in Turbo Codes* - poster presentations
 - Society for the Advancement of Chicanos and Native Americans in Science Conference, Tampa, FL, Oct 2007
 - Scholars at the Capitol, State Capitol Building, St. Paul, MN, Feb 2007
 - Joint Mathematics Meetings, Undergraduate Poster Session, New Orleans, LA, Jan 2007
- Algebraic Interleavers in Turbo Codes* - contributed talks
- Pi Mu Epsilon Regional Conference, St. John's University, Collegeville, MN, Apr 2007
 - Concordia College Student Lecture Series, Concordia College, Moorhead, MN, Jan 2007
 - Pi Mu Epsilon REU Night, Concordia College, Moorhead, MN, Nov 2006
- TEACHING
- ◇ Spring 2012, Applied Differential Equations (MA 341), instructor of record
 - ◇ Fall 2012, Honors Applied Differential Equations (MA 341H), teaching assistant
 - Assisted course instructor Dr. H.T. Banks by grading homework, facilitating problem sessions, and giving a total of three weeks of lectures during the semester; as participant in PTP program
 - Course covered separable, first order linear, exact, second order linear, Laplace transforms, and matrix methods
 - ◇ Preparing the Professoriate (PTP) Program, Fall 2011-Spring 2012
<http://www.ncsu.edu/grad/preparing-future-leaders/teaching-programs/ptp/>
 - Program includes a fall observation semester and spring teaching semester, as well as seminars on various aspects of teaching and on being a faculty member

RESEARCH
PROGRAMS

- ◇ **Student Researcher**, Center for Research in Scientific Computation, summers
 - Summer 2011, *Electromagnetic interrogation and determination of properties of a dielectric medium; continued work on distribution estimation*
Advisor: H.T. Banks
In collaboration with: S. Hu; W.C. Thompson
Support: GAANN Fellowship
 - Summer 2010, *Comparison/equivalence between Priesach hysteresis, relaxed controls, mixing distributions, and functional analysis distribution estimation*
Advisor: H.T. Banks
In collaboration with: W.C. Thompson
Support: GAANN Fellowship
 - Summer 2009, *Acoustic excitation and electromagnetic interrogation of buried targets*
Advisor: H.T. Banks
In collaboration with: W.C. Thompson, S. Hu, G.M. Kepler, K. Ito, T. Takeuchi, NCSU; L3 Communications team led by Dr. Jerrold Levine; and Dr. Richard Albanese
Support: GAANN Fellowship
- ◇ **NSF-REG**, Participant, North Carolina State University, summer 2008, *Comparing nonlinear filtering methods in the context of an HIV Model*
Advisor: H.T. Banks
In collaboration with: S. Hu
Sponsored by: NSF
- ◇ **Director's Summer Program**, Participant, National Security Agency, summer 2007
- ◇ **NSF-REU, Applied Mathematical Sciences Summer Institute (AMSSI)**, Participant, Loyola Marymount University and California Polytechnic Institute, Pomona, summer 2006, *Algebraic Interleavers in Turbo Codes*
Advisor: E. Mosteig
Graduate Research Assistant: L. Smith
In collaboration with: J. Dolloff, J. Rische, and D.A. Rogers
Sponsored by: NSF, DoD, and NSA

REVIEWS

- ◇ Refereed papers:
 - *Advances in Applied Mathematics and Mechanics*, 1 manuscript
 - *Inverse Problems in Science and Engineering*, 1 manuscript
- ◇ Spring/Fall 2011, draft of various chapters of *Applied Functional Analysis*, H.T. Banks, *in process*
- ◇ Jun 2009, draft of Chapter 7 of *Mathematical and Experimental Modeling of Physical and Biological Processes*, H.T. Banks and H.T. Tran, CRC Press, Boca Raton, 2009

PROFESSIONAL
EXPERIENCE

- ◇ Center Technical Support (with K.L. Rehm and W.C. Thompson), Center for Research in Scientific Computation and Center for Quantitative Studies in Biomedicine, Sept 2010-present
- ◇ Webmaster (with W.C. Thompson), Center for Research in Scientific Computation and Center for Quantitative Studies in Biomedicine, Aug 2010-present
- ◇ Research Training Modules, North Carolina State University
 - High performance computing resources, Dr. Gary Howell, 22 Oct 2010
 - Research and teaching statements, Faculty panel, 2 Oct 2009
 - Making the perfect poster, Adam Attarian, 30 Jan 2009
 - Using xfig and exporting figures, Dr. Ralph Smith, 31 Aug 2008
 - Illustrator and exporting figures, Dr. Michael Shearer, 24 Aug 2008

- ◇ Independent mathematics tutor, grades 8-12 and undergraduates, Raleigh, NC, Aug 2008-present
- ◇ Webmaster, Concordia College Dining Services, May 2005 - May 2007
- ◇ Mathematics Tutor (large and small groups, undergraduates), Academic Enhancement Center, Concordia College, Sept 2004-May 2008

COMPUTING
EXPERIENCE

Proficient with MATLAB, L^AT_EX, and HTML in Linux, Windows, and Mac OSX environments
Basic familiarity with PHP and Javascript in website development; C++ in Linux environment; and Java in Windows environment

AWARDS,
SCHOLARSHIPS

North Carolina State University

- ◇ Fellowship, Graduate Assistance in Areas of National Need–Computational Science, Aug 2008-present. <http://www.ncsu.edu/grad/financial-support/gaann.html>.

Concordia College

- ◇ Dr. Mae R. Anderson Scholarship, for graduate studies, Mathematics Department, Concordia College, Moorhead, MN, May 2008
- ◇ Moorhead Human Rights Award, with Katie Walker, Zach Kobrinsky, and Emma Hertsgaard, for work on protecting student rights/concerns by sitting on the Neighborhood Planning Study Working Group and for bringing student concerns to the Moorhead Planning Commission, Jan 2008
- ◇ Joint Math Meetings Student Poster Winner, *Algebraic Interleavers in Turbo Codes*, New Orleans, LA, Jan 2007, with J. Dolloff and J. Rische (advisors E. Mosteig and L. Smith)
- ◇ Second Place, K.N. Rao Mathematics Competition, North Dakota State University, Fargo, Fall 2004
- ◇ Presidential Distinction Scholarship, Concordia College, Aug 2004-May 2008
- ◇ National Merit Finalist - National Merit Scholarship, Concordia College, Aug 2004-May 2008
- ◇ Robert C. Byrd Honors Scholarship, State of Minnesota, Aug 2004-May 2008
- ◇ Elks National Foundation Scholarship, Aug 2004-May 2008

STUDENT
ORGANIZATIONS

- ◇ Treasurer, University Graduate Student Association, North Carolina State University, May 2010-May 2011, May 2011-present
- ◇ President, Mathematics Graduate Student Association, North Carolina State University, May 2009-May 2010
- ◇ President, Student Government Association, Concordia College, two terms, Apr 2006-Apr 2007 and Apr 2007-Apr 2008
 - Facilitated operations of Student Government, including hiring and managing other members
 - Oversaw implementation of a new constitution and the corresponding transition from a three-branch system to a single body organization
 - Served on various committees, including Faculty Senate, Student Affairs Committee, Budget Planning Committee, College Planning Committee, Nobel Peace Prize Forum Planning Committee
 - Ran student leadership internships: May Internship (2006) and August Internship (2007)
 - Prepared overall college Student Activity Fee proposal for years 2007-8 and 2008-9 as well as internal Student Government budget for years 2006-7 and 2007-8
 - Student Liaison to Board of Regents and National Alumni Board
- ◇ Orientation Leader, Concordia College, Aug 2006.

- ◇ Student Senate Chair and Sophomore Student Senator, Student Government Association, Concordia College, Apr 2005-Apr 2006.
 - Set Senate agendas, organized meetings, managed overall student government finances
 - Served on Faculty Senate, Student Affairs Committee
- ◇ Resident Assistant, Brown Hall, Concordia College, Aug 2005-May 2006
- ◇ Freshman Student Senator, Student Government Association, Concordia College, Sept 2004-Apr 2005
- ◇ Phi Beta Lambda, business club, Concordia College, Aug 2004-May 2008; Secretary (2005) and Vice President (2005-6); Attended State Leadership Conference 2005; 2006, 2007, 2008; Attended National Leadership Conference, 2005, Orlando, FL; Planned trip to visit businesses in Minneapolis, MN, Fall 2006
- ◇ Circle K Club, Concordia College, Aug 2004-May 2008
- ◇ Pi Mu Epsilon Math Club, Concordia College, Aug 2004-May 2008. President Aug 2005-May 2006