

Kathleen Holm

Environmental Protection Agency
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Technical Summary

- Research Interests
 - Developing statistical tools to estimate exposure from human biomonitoring data (reverse dosimetry).
 - Mathematical and statistical modeling, inverse problems, optimal design methods.
- Languages
 - Matlab, R, SAS, C++.

Career Overview

- Environmental Protection Agency
 - Aug 2011 - present
 - National Exposure Research Laboratory
 - Research Triangle Park, NC
 - Post-doctoral Statistician
 - Human Exposure and Atmospheric Sciences Division, Exposure and Dose Research Branch, Fall 2011 - Fall 2014
- North Carolina State University
 - Aug 2007 - July 2011
 - Biomathematics Graduate Program
 - Raleigh, NC
 - Graduate Research Assistant
 - Center for Quantitative Science in BioMedicine (CQSB) Graduate Pre-Doctoral Fellow, Spring 2008 - Summer 2011
 - Graduate Teaching Assistant
 - Instructor Assistant, Spring 2008
 - Introduction to Statistics , ST 311
 - Instructor Assistant, Fall 2007
 - Modeling of Biological Systems, BMA 567
- University of Arizona
 - Aug 2005 - May 2007
 - Mathematics Department
 - Tucson, AZ
 - Graduate Teaching Assistant

- Instructor, Summer Session II 2007
Introduction to Ordinary Differential Equations, Math 254
- Instructor Assistant, Spring 2007
Introduction to Ordinary Differential Equations, Math 254
- Instructor, Fall 2006
Math in Modern Society, Math 105
- Instructor, Fall 2005 and Spring 2006
College Algebra, Math 110
- International Business Machines
Jan 2004 - Aug 2004
Storage Systems Performance
9000 S. Rita Rd., Tucson, AZ 85744
 - Developed a program using Excel macros to extract useful statistical information from the performance output of data storage machines.
 - Assisted in improvements on Disk Magic GUI using Visual C++.
- Los Alamos National Laboratory
Summer 2003
Biosciences Division, Research Experience for Undergraduates
Los Alamos, NM
 - Developed an algorithm to find statistics of a pattern on a character string with application to patterns found in the amino acids in a family of proteins.
- Colorado State University
2001 - 2003
Mathematics Department
Ft. Collins, CO
 - Instructor Assistant for both Calculus and Real Analysis, grader.
- FDA National Center for Toxicological Research
Summer 2002
Division of Chemistry, Internship
Jefferson, AR
 - Correlated NMR spectra of estrogen compounds to relative binding affinity using Multiple Linear Regression.

Education

- **PhD Biomathematics**
PhD minor Statistics
Aug 2007 - July 2011
North Carolina State University
GPA: 3.792
- **Participant, Industrial Mathematical and Statistical Modeling Workshop for Graduate Students**
July 20-31, 2008
Statistical and Applied Mathematical Sciences Institute (SAMSI), and NCSU Center for Research in Scientific Computation (CRSC)

- **MS Applied Mathematics**

Aug 2004 - May 2007

University of Arizona

GPA: 3.325

- **BS Mathematics**

Aug 2000 - Dec 2003

Colorado State University

GPA: 3.759

Graduated Cum Laude

- Awards

- Lord/CRSC Fellowship
2010 - 2011
Center for Research in Scientific Computation
North Carolina State University
- Lucas Outstanding Service Award
2008 - 2009
Biomathematics Graduate Program
North Carolina State University
- NCSU Provost Fellowship
2007 - 2008
North Carolina State University
- Outstanding Teaching Assistant
Fall 2007
University Graduate Student Association
North Carolina State University
- NSF IGERT Partial Fellowship
2004 - 2005
Biology, Mathematics, and Physics Initiative
University of Arizona
- Magnus Scholarship
2003 - 2004
Mathematics Department
Colorado State University
- Phi Kappa Phi Natural Science Honored Junior
2003
College of Natural Science
Colorado State University

- Publications

- H.T. Banks, K. Holm and F. Kappel, Comparison of Optimal Design Methods in Inverse Problems, CRSC-TR10-11, May 2011; *Inverse Problems*, **27** (2011), 075002, 1-31.
- H.T. Banks, K. Holm and D. Robbins, Standard Error Computations for Uncertainty Quantification in Inverse Problems: Asymptotic Theory vs. Bootstrapping, *Mathematical and Computer Modelling*, **52** (2010), 1610-1625
- H.T. Banks, K. Holm and D. Robbins, Standard Error Computations for Uncertainty Quantification in Inverse Problems: Asymptotic Theory vs. Bootstrapping, CRSC-TR09-13, June, 2009; Revised, May, 2010.
- H.T. Banks, K. Holm, N.C. Wanner, A. Cintrón-Arias, G.M. Kepler, and J.D. Wetherington. A Mathematical Model for the First-Pass Dynamics of Antibiotics Acting on the Cardiovascular System, *Mathematical and Computer Modelling*, **50** (2009), 959-974

- R.D. Beger, K.J. Holm, D.A. Buzatu, and J.G. Wilkes, Using Simulated 2D ¹³C NMR Nearest Neighbor Connectivity Spectral Data Patterns to Model a Diverse Set of Estrogens, *Internet Electronic Journal of Molecular Design*, **2** (2003), 435-453.

- Presentations

- April 2011, Université de Rouen, Mathematics and Biology: Young Investigators International Workshop
Rouen, France
Comparison of Optimal Design Methods in Inverse Problems
Kathleen Holm
- Nov 2010, North Carolina State University, Applied Math Graduate Student Seminar (AMGSS)
Raleigh, NC
Comparison of Optimal Design Methods for a Glucose Regulation Model
Kathleen Holm
- Oct 2010, Virginia Tech, Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE)
Blacksburg, VA
A Comparison of Optimal Design Methods in Inverse Problems
Kathleen Holm
- April 2010, North Carolina State University, Biomath Seminar
Raleigh, NC
A Comparison of Optimal Design Methods in Inverse Problems
Kathleen Holm
- Oct 2009, North Carolina State University, Applied Math Graduate Student Seminar (AMGSS)
Raleigh, NC
An Introduction to Optimal Experimental Design and Generalized Sensitivity Functions
Kathleen Holm
- Jan 2009, Sterling Montessori School, 7th and 8th grade science classes
Morrisville, NC
What is Biomath?
Kathleen Holm
- Nov 2008, North Carolina State University, Biomath Seminar
Raleigh, NC
Analysis of a Mathematical Model for the First-Pass Dynamics of Antibiotics Acting on the Cardiovascular System
Kathleen Holm and Nathan Wanner
- Nov 2006, University of Arizona, Software Interest Group (SWIG) Seminar
Tucson, AZ
Presentations in LaTeX: An Introduction to FoilTeX, Prosper, and Beamer
Kathleen Holm

- Academic Societies

Society for Industrial and Applied Mathematics
American Statistical Association
American Mathematical Society