

Isaac Sunseri

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Education

North Carolina State University, Raleigh, NC

- PhD in Applied Mathematics, GPA 4.0, expected completion May 2022
- PhD advisor: Alen Alexandarian

North Carolina State University, Raleigh, NC

- BS in Mathematics with Minor in Statistics, GPA 4.0, *summa cum laude*, 2017

Employment

Sandia National Laboratories

May 2019-

Graduate R&D Intern – Optimization and Uncertainty Quantification

Description: I work with post-doc Joseph Hart and computational scientist Bart van Bloemen Waanders to solve problems involving inverse problems, sensitivity analysis, and uncertainty quantification. This includes proving mathematical claims analytically, writing research papers, and implementing numerical methods to solve problems in Trilinos.

North Carolina State University

January 2018-

Research Assistant – Department of Mathematics

Description: I work alongside Dr. Alen Alexandarian in a variety of mathematical fields including inverse problems, optimal experimental design, and uncertainty quantification. My research includes proving mathematical claims analytically, writing research papers, and implementing numerical methods to solve problems in Matlab or Python.

North Carolina State University

August 2017-

Teaching Assistant – Department of Mathematics

Description: I have been a teaching assistant at NC State in a variety of capacities including: lecture assistant, recitation leader, and instructor of record. This has involved grading exams, writing tests, and teaching a class size of both 30 students, and over 100 students.

Research

Areas: Numerical analysis, inverse problems, uncertainty quantification, sensitivity analysis, and PDE constrained optimization.

Specifics: My research focuses on solving inverse problems to reconstruct a parameter of interest from a set of observations. This is built upon further by using PDE constrained optimization to compute an optimal experimental design and sensitivity analysis to augment a given experimental design.

Teaching

North Carolina State University

Course #	Subject	Position	Semester
MA 241	Calculus II	Instructor of Record	Fall 2019
MA 241	Calculus II	Recitation Leader	Spring 2019
MA 131	Calculus I	Lecture Assistant	Fall 2017

Talks and Presentations

1. *Seminar Talk.* Isaac Sunseri and Alen Alexandarian. Bayesian Approach to Inverse Problems. North Carolina State University, Raleigh NC. Presented to NSF Research Training Group in Randomized Numerical Analysis. October 2018.
2. *Seminar Talk.* Isaac Sunseri. The Kryptos Cipher. North Carolina State University, Raleigh NC. Presented in the Undergraduate Research Seminar. May 2017.

Honors and Certifications

- NSF RTG Fellow at NC State University 2018
- SIAM Member 2018
- Undergraduate Valedictorian at NC State 2017
- NC State University Mathematics Honors Program Graduate 2017
- NC State University Scholar 2017
- NSF S-STEM Scholar 2016

Computer Skills

- Operating Systems: Windows, Mac OS, Linux
- Mathematical Packages: Matlab, Python, LaTeX, Trilinos
- Version Control: Github

Service

- Production Volunteer at The Summit Church, North Raleigh Campus (2017-)
- Undergraduate Mentor at North Carolina State University (2018-)
- Gave a talk at the NCSU undergraduate math Sum Club (Spring 2018)

Graduate Coursework

Numerical Analysis I & II, Partial Differential Equations I & II, Uncertainty Quantification, Inverse Problems, Mathematical Modeling, Dynamic Systems and Multivariable Control I, Functional Analysis, Lie Algebra, Linear Algebra, Topology

Publications

1. Isaac Sunseri, Joseph Hart, Bart van Bloemen Waanders, and Alen Alexandarian. A computational framework for quantifying the relative importance of data sources and physical parameters in PDE-based inverse problems. In preparation, 2019.
2. Alen Alexanderian, Noemi Petra, Georg Stadler, Isaac Sunseri. Marginalized A-optimal design of experiments for large-scale Bayesian linear inverse problems. In Preparation, 2019.
3. Isaac Sunseri and Alen Alexandarian. On marginals of Gaussian random vectors. Technical Report. North Carolina State University, 2018.
https://ipsunser.math.ncsu.edu/gaussian_marginals.pdf