

Neal S. Grantham, Ph.D.

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EDUCATION

NORTH CAROLINA STATE UNIVERSITY

Ph.D. in Statistics
Aug 2017 | Raleigh, NC

Thesis: Statistical Methods for High-Dimensional, Spatially-Distributed Microbiome Data from Next-Generation Sequencing

Master of Statistics
Aug 2014 | Raleigh, NC

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

B.S. in Mathematics
B.S. in Statistics
Jun 2012 | San Luis Obispo, CA
GPA: 3.84 | Magna Cum Laude

SKILLS

PROGRAMMING LANGUAGES

R	Fluent (8 years)
Python	Fluent (5 years)
Julia	Proficient (3 years)
SQL	Familiar
JavaScript	Familiar

DATA VISUALIZATION

ggplot2	Fluent
D3.js	Familiar
Leaflet.js	Familiar

REPRODUCIBLE RESEARCH

RMarkdown
Jupyter Notebooks
GNU Make
UNIX Pipelines

COMPUTATIONAL TASKS

Parallel programming
GPU computing
Web scraping

OS & SOFTWARE

MacOS & iOS
Ubuntu
Gsuite
L^AT_EX

EXPERIENCE

PHYLAGEN Data Scientist

Oct 2017 - present | San Francisco, CA

- Responsible for the statistical analysis of high volumes of microbial abundance data from environmental sources.

NC STATE Graduate Research Assistant

Jan 2014 - Aug 2017 | Advisor: Brian Reich | Raleigh, NC

- Constructed a robust and modular deep learning architecture to identify the geographic origins of dust samples based solely on their DNA-sequenced fungal communities — a "biogeographical fingerprint" with applications to forensics, funded by the U.S. Department of Defense.
- Developed a Bayesian mixed-effects model for the analysis of high-dimensional microbiome data as a response variable from designed experiments.
- Improved prediction of air pollutants over space and time via hierarchical Bayesian modeling of MODIS aerosol data captured by NASA satellites.

NASA NIFS Intern

Jun 2015 - Aug 2015 | Hampton, VA

- Built Hidden Markov Models in Python to classify mental state of pilots using eye-tracking, biophysical, and electrical brain signals during critical flight scenarios.
- Collaborated closely with aerospace engineers and biomedical engineers on open problems in aviation safety.

CAL POLY Undergraduate Research Assistant

Jun 2011 - Jun 2012 | Advisor: Andrew Schaffner | San Luis Obispo, CA

- Analyzed two-dimensional marked point process data to characterize clustering and segregation behavior of invasive colonial marine invertebrates.

TEACHING & CONSULTING

US EPA Statistical Consultant

Jan 2014 - May 2014 | Morrisville, NC

- Visualized correlation between seasonal precipitation and wet deposition biases in CMAQ v5.0.1, EPA's latest model on air quality & climate change.

NC STATE & DUKE CLINICAL RESEARCH INSTITUTE Mentor

Jun 2013 - Jul 2013 | Raleigh, NC & Durham, NC

- Guided undergraduate student learning & research in the Summer Institute for Training in Biostatistics (SIBS).

NC STATE Graduate Teaching Assistant

Aug 2012 - May 2013, Aug 2013 - Dec 2013 | Raleigh, NC

- Trained 90+ students each semester in statistical thinking via "flipped classroom" approach.
- Adapted core curriculum to diverse student backgrounds in business, economics, biological sciences, criminology, etc.

PUBLICATIONS

FORENSIC GEOLOCATION WITH DEEP NEURAL NETWORKS

In review, 2017

Neal S. Grantham, Brian J. Reich, Eric B. Laber, Krishna Pacifici, Julia A. Allwood, Noah Fierer, Robert R. Dunn, & Seth A. Faith

- Code to be made available at github.com/nsgrantham/forensic-geolocation.

SPATIAL REGRESSION WITH AN INFORMATIVELY-MISSING COVARIATE

In review, 2017

Neal S. Grantham, Brian J. Reich, Yang Liu, & Howard H. Chang

- Code to be made available at github.com/nsgrantham/spatial-covariate-informative-missingness.

A BAYESIAN MIXED-EFFECTS MODEL FOR MICROBIOME DATA FROM DESIGNED EXPERIMENTS

In review, 2017

Neal S. Grantham, Brian J. Reich, Elizabeth T. Borer, & Kevin Gross

- Code available at github.com/nsgrantham/mimix.
- JSM 2017 Distinguished Student Paper Award
- ENAR 2017 Distinguished Student Paper Award

FUNGI IDENTIFY THE GEOGRAPHIC ORIGIN OF DUST SAMPLES

PLOS One, 2015
Neal S. Grantham, Brian J. Reich, Krishna Pacifici, Eric B. Laber, Holly L. Menninger, Jessica B. Henley, Albert Barberán, Jonathan W. Leff, Noah Fierer, & Robert R. Dunn

- Code available at github.com/nsgrantham/fungi-identify.
- Press: [TIME](#), [NC State News](#)

PRESENTATIONS

2017	Baltimore, MD	Joint Statistical Meetings
2017	Washington, DC	Biometrics, Eastern North American Region
2016	Greensboro, NC	Adv. in Interdisciplinary Stats & Combinatorics
2016	Chicago, IL	Joint Statistical Meetings
2015	Seattle, WA	Joint Statistical Meetings
2015	Hampton, VA	NASA Langley Research Center
2015	College Station, TX	Texas A&M Workshop on Spatial Statistics
2014	Raleigh, NC	Statistics & Zoology Research Symposium

AWARDS

2017	\$1,200	NIJ Crime Forecasting Challenge Winner
2016	\$1,000	JSM 2017 Distinguished Student Paper Award
2016	\$650	ENAR 2017 Distinguished Student Paper Award
2015	\$300	Best Written Preliminary Exam, NC State Stats Department
2014	\$300	Paige Plagge Graduate Award for Citizenship
2014		Mu Sigma Rho Honors Society
2012		Cal Poly Science & Mathematics Senior Recognition Award
2009	\$1,200	George H. McMeen Mathematics Scholarship
2008	\$1,000	Volmar A. & Viola I. Folsom Mathematics Scholarship

COURSEWORK

GRADUATE

Machine Learning & Data Mining
Bayesian Statistics
Statistical Computing
Spatial & Spatio-temporal Modeling
Linear Models & Random Effects
Statistical Consulting
Statistics & Probability Theory
Causal Inference
Measurement Error

UNDERGRADUATE

Time Series Forecasting
Design & Analysis of Experiments
Survival Analysis
Multivariate Statistics
Linear Algebra & Matrix Methods
Ordinary & Partial Differential Eq.
Real & Complex Analysis
Abstract Algebra

HOBBIES

Distance Running
Hiking & Camping
Space & Astronomy
Former Radio DJ at WKNC 88.1 FM
Sci-Fi & Non-Fiction Books
Tech & Politics Podcasts