John W. Smith

⚲ Bozeman, MT   ✉ john.smith20@montana.edu   ☏ 973-534-2048   ⚭ https://johnwilliamsmithjr.github.io/

in john-smith-b56883108   ⌨ johnwilliamsmithjr

Professional Profile

- Team player that excels in unstructured problem solving in both applications and research with experience in time series analysis, machine learning, high performance computing, Bayesian hierarchical modeling, and high dimensional optimization via surrogate models.
- On track for tenure in my current academic position because of my passion for obtaining meaningful results on relevant, real-world projects.
- Strong background in statistical collaboration, both from experience as a statistical consultant during graduate school and my highly interdisciplinary research program as a faculty member.

Education

Virginia Tech   *Jan 2018 – May 2022*
Ph.D. in Statistics

- Advisors: Dr. Leah R. Johnson (primary) and Dr. R. Quinn Thomas (co-advisor)
- Dissertation title: *Ecosystem Models in a Bayesian State Space Framework*

Virginia Tech   *Aug 2016 – Dec 2017*
M.S. in Statistics

Virginia Tech   *Aug 2012 – May 2016*
B.S. in Applied and Computational Mathematics, with Honors

Experience

Assistant Professor of Mathematical Sciences   *Bozeman, MT*
Montana State University   *Aug 2022 – Present*

- My current appointment is a tenure track position with 40% Teaching, 40% Research and 20% Service.
- I develop and teach courses at both the graduate and undergraduate level.
- I mentor graduate and undergraduate students in a research setting.
- I serve on various departmental level and university level committees.

Bozeman Ecological and Environmental Statistics Group   *Bozeman, MT*
Montana State University   *Aug 2022 – Present*

- I am currently the co-leader of the Bozeman Ecological and Environmental Statistics (BEES) group alongside Dr. Christian Stratton.
- BEES is a community of researchers from Montana State University and USGS Northern Rockies.
- I assist in organization of meetings for two distinct aspects of BEES: paper discussion groups and graduate student presentations of research in progress.
- I aim to facilitate discussion and collaboration between graduate students and faculty that are interested in ecological and environmental statistics.

QED Lab   *Blacksburg, VA*
Virginia Tech   *Jan 2018 – May 2022*

- My dissertation research was highly interdisciplinary and focused on modeling complex ecosystem processes as statistical state space models.
- I worked with Ecologists to understand the process-based models that they use to describe carbon movement through terrestrial ecosystems and designed statistical frameworks for uncertainty quantification.
- I developed a number of novel approaches to alleviate computational burdens while still allowing for robust uncertainty quantification, using both Bayesian and frequentist paradigms.
- In addition to my dissertation research, I worked with the QED Lab to create `bayesTPC`, an `R` package for

fitting non-linear mathematical functions in a Bayesian framework.

Research Assistant
Virginia Tech

Blacksburg, VA
Jan 2018 – Jan 2019

- I worked on developing and implementing Bayesian Dynamic Energy Budget models to describe the life cycle of albatross.
- This project involved digitizing data for validation, writing and debugging C++ code used for model fitting, and looking at diagnostics for fitted models.

Statistical Consultant
Statistical Applications and Innovations Group

Blacksburg, VA
July 2017 – Aug 2020

- I worked as a lead collaborator and statistical consultant for the statistical consulting center on the Virginia Tech campus.
- I collaborated on a variety interdisciplinary projects, ranging from design of agricultural experiments to Bayesian population models to creation of statistical software.
- I designed and administered short courses to graduate students and faculty on diverse topics ranging from linear regression to machine learning.

Undergraduate Research Assistant
Virginia Tech

Blacksburg, VA
Jun 2014 – Aug 2015

- I worked as a co-principal investigator on the NSF funded project *Modeling and numerical simulation of yield stress fluids, and studies of viscoelasticity and confinement in the flow of two immiscible fluids* under Dr. Yuriko Renardy.
- Our task was to compare various computational techniques for tracking the interface between two immisicble fluids
- I derived Green's functions for special 2-dimensional cases of bounded channel flow.
- I ran computer simulation experiments, edited `ForTran` code, and recorded and analysed output from our computer model.

Peer Reviewed Publications

In Progress

Jacob Oard, Ian Laga, **John W. Smith** *Dynamic Latent Space Cluster Model: Modeling US Political Division*, in preparation	2025
S. William Hammond, **John W. Smith**, Nicole Kamarat *Addressing Shortcomings in Information Criterion for State Space Models: A data driven approach*, in preparation	2025
Raja Nagisetty, Jeremy Crowley, **John W. Smith**, et. al *Improving Particulate Matter 2.5 Prediction in Montana by Combining Imputation with Machine Learning*, in preparation	2025

In Review

Nathan Wycoff, **John W. Smith**, Annie S. Booth, Robert B. Gramacy (2024) *Voronoi Candidates for Bayesian Optimization*, Journal of Global Optimization, *under review*	2024

Accepted

Sean Sorek, **John W. Smith**, Paul J. Huxley, Leah R. Johnson *bayesTPC: Bayesian Inference for Thermal Performance Curves in R*, Methods in Ecology and Evolution, *accepted*	2024
John W. Smith, Leah R. Johnson, R. Quinn Thomas (2023) *Parameterizing Lognormal Bayesian State Space Models using Moment Matching*, Environmental and Ecological Statistics, *published*	2023
John W. Smith, Leah R. Johnson, R. Quinn Thomas (2023), *Assessing Ecosystem State Space Models: Identifiability and Estimation*, Journal of Agricultural, Biological, and Environmental Statistics, *published*	2023

Abigail S. L. Lewis, Whitney M. Woelmer, Heather L. Wander, Dexter W. Howard, **John W. Smith**, Ryan P. McClure, Mary E. Lofton, Nicholas W. Hammond, Rachel S. Corrigan, R. Quinn Thomas, Cayelan C. Carey (2022), *Increased adoption of best practices in ecological forecasting enables comparisons of forecastability*, Ecological Applications, *published* — 2022

Lauren M. Childs, Fadoua El Moustaid, Zachary Gajewski, Sarah Kadelka, Ryan Nikin-Beers, **John W. Smith**, Melody Walker, Leah R. Johnson (2019), *Linked within-host and between-host models and data for infectious diseases: a systematic review*, PeerJ, *published* — 2019

Mary Anne Steinberg, Cheryl Walther, Maria Herbst, Jennifer West, Dixie Zamagias, **John W. Smith** (2018), *Learning Specialists in College Athletics: Who are they and what do they do?*, Journal of Higher Education Athletics & Innovation, *published* — 2018

Technologies

Languages: Strong experience in R, C++, C. Experience with Python, MATLAB, Octave, Julia, ForTran 77, 90, and 95. Quick to learn new programming languages and software packages.

Technologies: High performance computing experience using Slurm scheduler. Experience with writing bash scripts, well acquainted with Linux and Unix computing, terminal use, and text editors such as `vim`.

Presentations

Seminars and Invited Talks

- *Statistical Approaches to Filtering*: Bobcat Technology and AI Learning Seminar, Montana State University, Bozeman, MT, November 2024

- *Predicting pm2.5 using Montana statewide satellite-based wildfire hazardous particulate*: Bobcat Technology and AI Learning Seminar, Montana State University, Bozeman, MT, October 2024

- *The Common Task Framework (And You!) Part II: Electric Boogaloo*: Bobcat Technology and AI Learning Seminar, Montana State University, Bozeman, MT, February 2024

- *The Common Task Framework (And You!)*: Bobcat Technology and AI Learning Seminar, Montana State University, Bozeman, MT, September 2023

- *Process-based Modeling Approaches to Forest Carbon Prediction*: Applied Mathematics Seminar, Montana State University, Bozeman, MT, November 2022

- *Predicting Carbon in Forest Ecosystems: A Case for Process-based Modeling Approaches*: Montana American Statistical Association Annual Chapter meeting, Bozeman, MT, October 2022 (Invited Talk)

- *Assessing Ecosystem State Space Models: Identifiability and Estimation*: Department of Mathematics, Montana State University, Bozeman, MT, December 2021

- *Bayesian Utility Analysis: A Hiring Simulation*: Prospective Graduate Student Day, Virginia Tech, Blacksburg, VA, April 2018

- *Bayesian Utility Analysis: A Hiring Simulation*: College of Science Roundtable Advisory Board Meeting, Virginia Tech, Blacksburg, VA, March 2018

Posters

- *Embedding Positive Dynamical Systems into State Space Models using Moment Matching:* The American Statistical Association's ENVR Workshop on Environmental and Ecological Statistical Research and Applications with Societal Impacts, Provo, UT, October 2022

- *Bayesian Parameter Estimation for Ecosystem State Space Models with Linear Autoregressive Process Models*: Virginia Tech Corporate Partners Poster Session, Blacksburg, VA, October 2019

- *Bayesian Parameter Estimation for Ecosystem State Space Models with Linear Autoregressive Process Models*: Spring Research Conference, Blacksburg, VA, May 2019

- *Bayesian Parameter Estimation for Ecosystem State Space Models with Linear Autoregressive Process Models*: Ecological Forecasting Initiative Conference, Washington D.C., May 2019

- *Evaluating Path Choices During Hurricane Evacuations*: Virginia Tech Corporate Partners Poster Session, Blacksburg, VA, October 2017

Academic Teaching Experience

- **STAT509/MATH509**, *Stochastic Processes*, S2025 (MSU)
- **STAT502/MATH502**, *Intermediate Mathematical Statistics*, S2024, S2025 (MSU)
- **STAT408**, *Statistical Computing and Graphical Analysis*, F2022, S2023, F2023, S2024 (MSU)
- **STAT436**, *Introduction to Time Series Analysis*, F2022, F2024 (MSU)
- **STAT536**, *Time Series Analysis*, F2022 (MSU)
- **STAT4106**, *Theoretical Statistics II*, F2019 (Virginia Tech)

Module and Short Course Development

- **Spatial forecast of post fire recovery using MODIS LAI** *Workshop for Ecological Forecasting Initiative*, Spring 2025
- **Statistics through Simulation** *Intro to Mathematical Learning Seminar*, Fall 2023, Fall 2024
- **A Bridge Program in Statistical Computing** *Graduate Student Orientation*, Summer 2023, Summer 2024
- **Bobcat TAILS: Technology and AI Learning Seminar** *NSF AI Institute*, Spring 2023
- **Bayesian State Space Modeling for Time Series Data** *VectorBiTE RCN*, Summer 2021
- **Data Visualization in R** *Statistical Application and Innovation Group*, Summer 2020
- **Data Manipulation in R** *Statistical Application and Innovation Group*, Summer 2020
- **Machine Learning** *Statistical Application and Innovation Group*, Summer 2020

Funding

Competitive Grants

- **Co-PI**: 2021-2026, AI Institute: Dynamic Systems (sub-award through University of Washington). National Science Foundation. $ 1,498,828. PI team: Scott McCalla, Katie Banner, Bree Cummins, **John W. Smith**
- **Co-PI** 2024 - 2025, Montana statewide satellite-based wildfire hazardous particulate early warning system. Montana INBRE (National Institutes of Health). $ 86,266. PI team: Raja Nagisetty, Jeremy Crowley, **John W. Smith**

Other Grants

- **PI**: 2023, A Summer Bridge Program in Computing for Incoming Graduate Students in Statistics. Montana State University Center for Faculty Excellence. $ 5,000

Student Advising and Mentoring

Ph.D. Advising, Statistics

- S. William Hammond, *Approximations to Information Criterion for Model Selection in Non-linear State Space Models* (2023 - present)

Ph.D. Committees, Statistics

- Sarah Mensah (2024 - Present)
- Kevin Surya (2024 - Present)
- Benjamin Vogel (2024 - Present)
- Meaghan Winder (2023 - Present)
- C. Patrick Pollock (2024 - Present)
- Lakviru Perera (2024 - Present)
- Jacob Munson (2023 - Present)

M.S. Advising, Statistics

- Kingsley Abunyewa, *Wavelet Analysis for Time Series Modeling of Financial Data* (Spring 2025, expected)
- Eliot Liucci, *Exploration of Long Short-Term Memory Networks for Time Series Forecasting* (Fall 2024)
- Julius Caesar Ganaa, *Blending Approach to Forecasting Stock Prices* (Spring 2024)
- Jacob Oard, *Dynamic Latent Space Cluster Model: Modeling US Political Division* (Spring 2023, Co-advised with Dr. Ian Laga)

M.S. Committees, Statistics
- Ebenezer Mensah (2024 - Present)
- Benjamin DeVries (2024 - Present)
- Bernard Ntiamoah (2024 - Present)
- Joseph Niakoh (2024 - Present)
- Madison Alderman (2024 - Present)
- Roland Owusu (2024 - Present)
- Terese Azevedo (2023 - Present)
- Victoria Easton (2022 - 2023)
- Riley Collins (2022 - 2023)
- S. William Hammond (2022 - 2023)

M.S. Committees, Other Disciplines
- Tanner Jones, Industrial and Management Systems Engineering (2024)
- Nathan Baker, Data Science (2023 - 2024)
- David Steinberg, Mathematics (2024 - Present)
- Ryan Kardoes, Data Science (2024 - Present)

Professional Activities and Service

Professional Service
- *Council of Chapter Representative, Montana Chapter of the American Statistical Association* October 2024 - present
- *Reviewer, Annals of Applied Statistics* July 2024 - present
- *Prize Committee Member for Ecological Society of America's 'Ecological Forecasting Award'* 2024
- *Organizer, Montana Chapter of the American Statistical Association Annual Chapter Meeting* Fall 2023, Fall 2024
- *Volunteer, ASA DataFest* Spring 2018; Spring 2019; Spring 2023; Spring 2024
- *President, Montana Chapter of the American Statistical Association* October 2023 - October 2024
- *Reviewer, Nature Sustainability* June 2023 - Present
- *USGS Fundamental Science Practices Reviewer* January 2023 - present
- *Vice President, Montana Chapter of the American Statistical Association* October 2022 - October 2023
- *Judge, CMDA Fall Data Competition* Fall 2018, Fall 2021

Academic Service
- *Member, University Computer Fee Allocation Committee*, Spring 2025 - Present
- *Member, Faculty Search Committee, Department of Mathematical Sciences* Fall 2024 - Spring 2025
- *Member, Graduate Program Committee, Department of Mathematical Sciences* Summer 2023 - Present
- *Member, Mathematical Sciences Computer Committee* Fall 2022 - Present

Organizations
- *Ecological Forecasting Initiative: Member*, 2022 - present
- *American Statistical Association: Member* 2022 - present
- *Mu Sigma Rho National Statistics Honor Society: Member* 2017 - present
- *Phi Beta Kappa Honor Society: Member* 2016 - present
- *Pi Mu Epsilon National Mathematics Honor Society: Member* 2014 - present
- *Virginia Tech Mathematics Club: Member* 2012 - 2016

Honors and Awards

- Research Award Recipient: National Association of Academic and Student-Athlete Development Professionals (2018)
- Outstanding First Year Ph.D. Student (Statistics), Virginia Tech (2016)
- TW Hatcher Mathematical Scholar, Virginia Tech (2015)
- Carl A. Persinger Award (Mathematics), Virginia Tech (2015)
- TW Hatcher Mathematical Scholar, Virginia Tech (2014)