John Tipton | Curriculum Vitae

2212 Vassar Ave – Fort Collins, CO, 80525
(970) 231-9494 • jtipton25@gmail.com

Oregon State University Search Committee February 2, 2016
Oregon State University
Department of Statistics
239 Weniger Hall
Corvallis, OR 97331

Dear Oregon State University Search Committee,

I am a well qualified candidate for the Assistant Professor position developing course materials for the new teaching programs in Data Analytics. I have a strong background in teaching and course development, having been the primary instructor for 5 semesters of introductory statistics while generating my own lecture materials. I am well suited to a teaching and research position as my research has been highly applied and interdisciplinary.

I am an excellent collaborator, having received awards for my consulting, and I thrive in an interdisciplinary team environment. I have collaborated with many research groups and government agencies including PalEON, the US Forest Service, and the US National Park Service. I can bring my experience working with other scientists to both the teaching and research responsibilities, contributing to the Oregon State University Statistics Department.

In my research career, I have produced quality research using statistical modeling techniques to answer a number of scientific questions using spatio-temporal and computational statistics and I am defending my dissertation on this research in early March. Recent projects include:

- A mechanistic, multiscale model for reconstruction of late Holocene joint temperature and precipitation from tree ring width data.
  - ASA ENVR 2015 student paper award.
- A spatio-temporal reconstruction of early 1800's temperature in the Upper Midwestern United States from sparse historical temperature records.
- A reconstruction of water depth from assemblages of Testate Amoeba species data in peat bogs.

For each project I developed novel models to meet the needs of the data. I conducted simulation studies to evaluate model performance, wrote MCMC samplers in C++ and R, and explored spatio-temporal models that incorporate dimension reduction, regularization and model selection, predictive validation in the context of proper scoring rules, Gaussian Markov Random Field methods, and improved computation within a Bayesian hierarchical model framework.

Sincerely,

John Tipton

Attached: curriculum vitæ

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Education

Colorado State University **Fort Collins**
Ph.D. Candidate in Statistics *2011–Present*
Advisors - Mevin Hooten and Jean Opsomer

Dissertation - Improved estimation and prediction for computationally expensive ecological and paleoclimate models.

Colorado State University **Fort Collins**
Masters of Science in Statistics *2008–2011*
Advisor - Jean Opsomer

Colorado State University **Fort Collins**
Bachelors of Science in Mathematics and Zoology *2001–2005*

Experience

PalEON

Graduate Research Assistant *2013–2016*
Developed Bayesian hierarchical models for reconstruction of paleoclimate using proxy data.

Detailed achievements:

- Spatially explicit reconstruction of average July temperature in the U.S.
  - Data from historical military fort records
  - EOF regression with spatial random effects
  - Model selection techniques to provide shrinkage of estimates
  - Validation of predictive ability in a simulation experiment
- Reconstruction of temperature and precipitation from tree rings
  - Data assimilation from different sources and scales in the Hudson Valley, New York
  - Extension of cutting edge modeling techniques to increase predictive skill
  - Use of model selection to choose between non-linear process models for tree ring growth

United States Forest Service

Graduate Research Assistant *2009–2013*
Research on sampling methods for pilot study of tree canopy cover and application of state of the art survey sampling methodologies to aid in development of the National Land Cover Database.

Detailed achievements:

- Inclusion of powerful machine learning methods in a statistical framework
- Analysis of remote sensing and statistical techniques for creation of land cover maps
- Sample size and power calculations to improve sampling methods and decrease cost

Teaching Experience

Colorado State University Statistics Department
Graduate Instructor/Teaching Assistant *2009–2015*
Instructor of record for:
- ST 307 Intro to Biostatistics, three semesters
- ST 204 Business Statistics, two semesters

Teaching assistant for:
- ST 472 Statistical Consulting, one semester
- ST 301 Intro to Statistics Online, one semester
- ST 204 Business Statistics, one semester

Discussant
Workshop on Parallel Computing, CU/CSU, 2015 *2015*

Teaching Assistant
Building Capacity in Bayesian Modeling for Ecologists (NSF), 2 days *2015 and 2014*

Teaching Assistant
R Workshop (CSU-CCFRWU), 1 day *2015 and 2013*

Publications

Published and In Review

2016: Trevor Hefley, Kristin Broms, Brian Brost, Frances Buderman, Shannon Kay, Henry Scharf, John Tipton, Perry Williams, and Mevin Hooten. The basis function approach to modeling dependent ecological data. *Ecography*. In Review.

2016: Douglas Silver, Brett Johnson, William Pate, Kyle Christianson, John Tipton, James Sherwood, Brian Smith, Yun Hao, and Patrick Martinez. Effect of net size on estimates of abundance, size/age, and sex of *Mysis diluviana*. *Journal of Great Lakes Research*, In Review

2016: John Tipton, Mevin Hooten, Neil Pederson, Martin Tingley and Daniel Bishop. Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models. *Environmetrics*, 27(1):42-54.

2013: John Tipton, Jean Opsomer, and Gretchen Moisen. Properties of endogenous post-stratified estimation using remote sensing data. *Remote Sensing of Environment*, 139:130-137.

2012: John Tipton, Gretchen Moisen, Paul Patterson, and Thomas Jackson. Sampling intensity and normalization: Exploring cost-driving factors in nationwide mapping of tree canopy cover. In: *McWilliams, Will and Roesch, Frank, (compilers). 2010 Forest Inventory and Analysis (FIA) Symposium.*

2012: Thomas Jackson, Gretchen Moisen, Paul Patterson and John Tipton. Repeatability in photo-interpretation of tree canopy cover and its effect on predictive mapping. In: *McWilliams, Will and Roesch, Frank, (compilers). 2010 Forest Inventory and Analysis (FIA) Symposium.*

2005: David Gammon, Myron Baker, and John Tipton. Cultural divergence within novel song in the black-capped chickadee (*Poecile atricapillus*). *The Auk*, 122, 853-871.

In Prep

2016: John Tipton, Mevin Hooten, Simon Goring, Jack Williams. Reconstruction of spatio-temporal temperature processes from sparse historical records using probabilistic principal component regression.

2016: John Tipton, Mevin Hooten, Connor Nolan, Bob Booth. A reconstruction of water depth from assemblages of testate Amoeba species data in peat bogs.

Presentations

Invited

2015: Presentation - ASA - ENVR Student Paper Award: Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models

2015: Poster - ASA - STATMOS: Reconstruction of late Holocene climate based on tree growth and mechanistic hierarchical models

2014: Presentation - American Geophysical Union: A statistical reconstruction of bivariate climate from tree ring width measurements using scientifically motivated process models

Contributed

2014: Poster - American Geophysical Union - co-author: Effects of European land use on contemporary tree-climate relationships in the northeastern United States: Implications for predictive models

2014: Presentation - ASA: Reconstruction of historical climate using a reduced rank predictive process model

2012: Presentation - Forest Inventory and Analysis Symposium: Properties of the endogenous post-stratified estimator using a random forest model

2012: Presentation - ASA: Endogenous post-stratification using random forests

Honors/Awards

2015: American Statistical Association ENVR Student Paper Competition Award

2014: Thomas J. and Eileen C. Boardman Statistical Consulting Award

2014: American Statistical Association Student Travel Award

2012: American Statistical Association Wray Jackson Smith Award

Software and Computing

- R
- LaTeX
- C++
- Linux