Trevor Harris

Contact

Department of Statistics
University of Illinois at Urbana-Champaign

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Research Interests

Functional data analysis, anomaly detection, spatial statistics, climate change and paleoclimate reconstructions, Bayesian machine learning and scalable inference. Current projects apply deep generative models to climate model output and study their uncertainty quantification capabilities.

Education

PhD Statistics 2016–Expected in May 2021
University of Illinois at Urbana-Champaign, Champaign, IL
Advisor: Dr. Bo Li

BS Mathematics 2010–2014
University of Florida, Gainesville, FL
Advisors: Dr. Murali Rao and Dr. Farid AitSahlia
Thesis: *Estimating an optimal stopping time policy for American options*

Research Experience

Research Assistant, Department of Statistics 2017–Present
University of Illinois, Champaign, IL
Advisor: Dr. Bo Li

Graduate Intern, Mission Algorithms R&S Summer 2018, 2019–Present
Sandia National Laboratories, Albuquerque, NM
Advisor: Dr. J. Derek Tucker

Teaching Experience

Teaching Assistant, Department of Accounting 2017
University of Illinois, Champaign, IL
–ACCY 570: Data Analytics Foundations for Accountancy
–ACCY 571: Statistical Analyses for Accountancy

Teaching Assistant, Department of Statistics 2016–2017
University of Illinois, Champaign, IL
–STAT 400: Statistics and Probability I

Professional Experience

Product Modeling Analyst, Underwriting Research 2014–2016
GEICO, Washington D.C.

Awards and Honors

Nominated for the UIUC Dissertation Completion Fellowship (2nd place)	2020
Selected to attend the NextProf Science Workshop (cancelled due to Coronavirus)	2020
Honorable mention in the ICSA Midwest student poster competition	2019
UIUC Statistics Department's Leadership and Service award	2019
Awarded travel funding for the 2019 STATMOS Spatial Statistics Workshop	2019
UIUC List of Teachers Ranked as Excellent by Their Students	2016
Graduated *magna cum laude* at University of Florida	2014

Publications

Harris, T., Li, B., Tucker, J. D. (2020). *Scalable Multiple Change Point Detection for Functional Data Sequences*. Submitted to Technometrics.

Harris, T., Li, B., Steiger, N., Smerdon, J., Tucker, J. D., Narisetty, N. (2020). *Evaluating proxy influence in assimilated paleoclimate reconstructions – Testing the exchangeability of two ensembles of spatial processes*. Journal of the American Statistical Association. arXiv.

Harris, T., Tucker, J. D., Li, B., Shand, L. (2020). *Elastic Depths for Detecting Shape Anomalies in Functional Data*. Technometrics. arXiv.

Harris, T., Li, B. (2019). *Kriging*. Wiley Statsref: Statistics Reference Online. Article.

Conference Presentations

Fast functional change point detection with total variation denoising, Joint Statistical Meeting, Philadelphia, July 2020

Evaluating proxy influence in assimilated paleoclimate reconstructions, ENAR 2020 Spring Meeting, Nashville, Mar 2020

Evaluating proxy influence in assimilated paleoclimate reconstructions, AGU Fall Meeting 2019, San Francisco, Dec 2019

Evaluating proxy influence in paleoclimate reconstructions, ICSA Midwest Chapter Meeting, Chicago, Oct 2019

Elastic depths for identifying shape anomalies in functional data, 62nd World Statistical Congress, Kuala Lumpur, Aug 2019

Evaluating proxy influence in paleoclimate reconstructions, JSM, Denver, Aug 2019

Evaluating proxy influence in data assimilation algorithms, Bohrer Workshop (UIUC), Champaign, Nov 2018

Evaluating proxy influence in data assimilation based climate field, CISL Climate Informatics (NCAR), Boulder, Sept 2018

Evaluating proxy Influence and reconstruction skill in data assimilation based climate field reconstructions using extremal depth, Joint Statistical Meeting, Vancouver, July 2018

Other Presentations

Functional change point detection with non-negative matrix factorization, MARTIAN's Symposium, Sandia National Labs, July 2019

An introduction to non-negative matrix factorization, Intern Symposium, Sandia National Labs, June 2019

Identifying phase and amplitude extremes in functional data with elastic depth, Statistics Graduate Student Seminar (UIUC), Champaign, Mar 2019

Testing the exchangeability of two spatiotemporal processes with applications to data assimilation, Illinois Climate Seminar (UIUC), Champaign, Mar 2019

Identifying phase and amplitude extremes in functional Data with elastic depth, Sandia/UIUC Tech Talks (UIUC), Champaign, Sept 2018

Elastic depth for amplitude and phase in functional data, MARTIAN's Symposium, Sandia National Lab, July 2018

Elastic functional principal component regression, Intern Symposium, Sandia National Lab, July 2018

Professional Activities

Reviewer: Journal of the American Statistical Association, Journal of Multivariate Analysis, Technometrics, Climate Informatics, Statistical Methods & Applications

Member: American Statistical Association (2016–Present), Institute of Mathematical Statistics (2019–Present), American Geophysical Union (2019–Present), International Chinese Statistical Association (2019–Present)

Service

Founding member: PhD Student Seminar series at UIUC 2018–Present

Founding member: Statistics Graduate Student Organization at UIUC 2017–Present

President: Statistics in the Community at UIUC 2017–2018

Software

fmci: R package for functional change point detection with the multiple changepoint isolation method Github.

elasticdepth: R package for computing elastic depths and identifying shape outliers. Github.

kstat: R package for the Kolmogorov-Depth statistic for comparing testing if two functional distribution differ. Github.

extdepth: R package for the functional data depth notion: Extremal Depth. Github.

Technical Skills

Programming: R, Python, SAS, SQL, C++/Rcpp, VBA, Bash

Misc: Linux, Git, Docker, LaTeX