Tim Coleman

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Citizenship

United Kingdom, United States (naturalized)

Education

University of Pittsburgh
Ph.D., Statistics, 2016 to present. Advisor: Lucas Mentch.
MA, Statistics, 2016-2018
Ph.D. GPA: 3.93
Ph.D. Preliminary Exam: Passed, Fall 2017
Ph.D. Proposal/Comprehensive Exam: Passed, Spring 2019

Colgate University
B.A. with majors in Applied Math and Geography, 2012 - 2016

Research Interests

Uncertainty quantification, statistical learning methods (particularly random forests), dynamical systems, chaos theory, system identification, Gaussian random processes
Applications to: Space weather/climate, terrestrial weather/climate, ecology,

Publications

Coleman T., J.P. McCollough, S.L Young, and E.J. Rigler. (2018),
Operational Nowcasting of Electron Flux Levels in the Outer Zone of Earth's Radiation Belt,
Space Weather, 16. https://doi.org/10.1029/2017SW001788

In Review

Coleman, T., L. Mentch, D. Fink, F. La Sorte, G. Hooker, D. Winkler, and W. Hochachka (2017)
Statistical Inferences on Tree Swallow Migrations, Using Random Forests
Manuscript @ https://arxiv.org/abs/1710.09793
Submitted to: Journal of the Royal Statistical Society, Series C

Peng W., T. Coleman, and L. Mentch
Asymptotic Distributions and Rates of Convergence for Random Forests
and Other Resampled Ensemble Learners
Manuscript @ https://arxiv.org/abs/1905.10651
Submitted to: Annals of Statistics

In Preparation

Coleman, T., W. Peng, and L. Mentch (2019)
Scalable and Efficient Hypothesis Testing Using Random Forests
Manuscript @ https://arxiv.org/abs/1904.07830

Coleman, T., M.F. Dorn, K. Kaufeld., and L. Mentch (2019)
Locally Optimized Random Forest

Presentations

Posters

Importance Forest: A Semi-Supervised Solution to Forecasting Outages During a Hundred Year Storm
ASA Pittsburgh Chapter Meeting, April 16 2019, Pittsburgh PA

An Efficient Permutation Test for Feature Significance in Random Forests
Presented at: ASA Pittsburgh Chapter Meeting, April 10, 2018, Pittsburgh PA
and Dietrich School of Arts and Sciences Grad Student Expo, March 23th 2018, Pittsburgh PA

Quantifying Uncertainty in Random Forest Predictions
Statistical Perspectives on Uncertainty Quantification, May 30th 2017, Atlanta GA

Quantifying the Relationship Between Maximum Temperature and Tree Swallow Migration in the Eastern United States Using Random Forest Confidence Intervals
ASA Pittsburgh Chapter Meeting, April 4th 2017, Pittsburgh PA

Quantifying the Relationship Between Maximum Temperature and Tree Swallow Migration in the Eastern United States Using Random Forest Confidence Intervals
Dietrich School of Arts and Sciences Grad Student Expo, March 24th 2017, Pittsburgh PA

Inference on Random Forest Ensembles Applied to Tree Swallow Migration
Advancing Research Through Computing Conference 2017, March 2nd 2017, Pittsburgh PA

Presentations

Precision VISSTA: Machine Learning Prediction and Inferencefor Bring-Your-Own-Device (BYOD) mHealth Data
Additional Authors: Lucas Mentch, Kimberly Glass, David Gotz, NilsGehlenborg, Arlene E. Chung
AMIA 2019 Annual Symposium, November 18 2019 (upcoming)

Importance Forest: A Semi-Supervised Semi-Solution to Forecasting Power Outages
Los Alamos CCS-6 *Talking to Our Selves* Series, May 29th 2019, Los Alamos NM

A Technique for the Automated Detection of Lake Effect Snow
American Association of Geographers General Meeting, April 2nd 2016, San Francisco CA

Research

University of Pittsburgh
Graduate Student Researcher 2016 - Present
Project: Uncertainty Quantification in Random Forest Models
Actively developing and implementing new inference procedures for machine learning methods, with applications to ecology and precision medicine.

Los Alamos National Laboratory
Graduate Student Intern (CCS-6, Statistical Sciences)
September 2018 - December 2018, May 2019 - June 2019
Project: Forecasting power outages during hurricanes using advanced machine learning methods. Developed and implemented an importance sampling based method for improving random forest predictions. Two publications currently in preparation as a result of this work.

Lawrence Livermore National Laboratory
Data Science Summer Institute (DSSI) Intern, May 2018 - August 2018
Project: Developed an anomaly detection system based on a sequential likelihood ratio test used on facility monitoring systems.

Air Force Research Laboratory
AFRL Summer Scholar (2017), Kirtland Air Force Base
Project: Assessment of Outer Zone Radiation Belt Models
Collaborated with James McCollough on conducting model assessment of electron flux levels in the Van Allen belts. Dynamic linear models were trained and tested on Van Allen Probe data, and forecast assessments made.

Colgate University
Undergraduate Research Assistant, 2014
Examined weather patterns in Western Australia through geospatial and temporal analysis of climate data in ArcGIS to establish a baseline for exploring the human impact of climate change

Teaching

University of Pittsburgh, Dept. of Statistics
Teaching Assistant Experience:

- STAT 2132, Applied Statistical Methods II (Graduate level), Spring 2018
- STAT 1361, Topics in Applied Stats: Data Mining, Spring 2017, 2018
- STAT 1291, Data Science in the Modern World, Fall 2017
- STAT 1100, Intro to Statistics for Business and Management, Spring 2017
- STAT 1000, Applied Statistical Methods, Fall 2016

Course Instructor Experience:

- STAT 1000, Applied Statistical Methods, Summer 2019

Colgate University, Dept. of Geography
Geographic Information Systems Lab Assistant, Spring 2015 - Spring 2016

Independent Tutoring
Math and Statistics Tutor, Varsity Tutors, June 2016 - Present

Awards and Fellowships

Mellon Fellowship, 2019-2020
Dietrich College of Arts and Sciences, University of Pittsburgh

NSF GRFP Honorable Mention, 2018

Junior Graduate Student of the Year 2018
University of Pittsburgh, Department of Statistics

Arts and Sciences Travel Grant
Graduate Student Organization, Spring 2017

Graduate and Professional Student Government Travel Grant
GSPG, Spring 2017

Honors in Geography
Hamilton, New York, 2016

Gamma Theta Upsilon Honor Society in Geography
Member since 2014

Journal Refereeing

Annals of Statistics, 2019

Work Experience

Harman International
Technology Intern, Summers 2013 and 2014

Undergraduate Thesis

A Technique for the Automated Detection of Lake Effect Snow in Central New York
Completed during 2015-2016
Applied statistical learning to detect radar signals associated with lake effect snow events. Used snow samples to verify the origin of snowfall events, then applied supervised learning techniques to test data. Project part of graduating with an honors degree in Geography.

Computing Languages

`R`, `Python`, `ArcGIS`, `SAS`, LaTeX