

Tim Coleman

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Citizenship United Kingdom, United States (naturalized)

Education **University of Pittsburgh**
Ph.D., Statistics, 2016-2020. Advisor: Lucas Mentch.
Dissertation: Advancing Inference in Supervised Learning Procedures via Permutation Tests and Importance Sampling, with Applications to Environmental Science
MA, Statistics, 2016-2018

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

Academic Positions Postdoctoral Scholar - Research Associate, USC Marshall School of Business
Supervisor: Jacob Bien, Project: *Statistical Network Inference and Time Series Analysis of Marine Ecosystems*

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>

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
Journal of the Royal Statistical Society, Series C

Coleman, T., M.F. Dorn, K. Kaufeld., and L. Mentch (2020)
Forecasting Hurricane-related Power Outages via Locally Optimized Random Forests
STAT Special Edition, SDSS 2020

Peng W., T. Coleman, and L. Mentch (2022)
Asymptotic Distributions and Rates of Convergence for Random Forests and Other Resampled Ensemble Learners
Electronic Journal of Statistics

Coleman, T., W. Peng, and L. Mentch (2019)
Scalable and Efficient Hypothesis Testing Using Random Forests
Manuscript @ <https://arxiv.org/abs/1904.07830>
Accepted to: *Journal of Machine Learning Research*

Wallace, M. , T. Coleman, L. Mentch, D. Buysse, J. Graves, E. Hagen, M. Hall, K. Stone,
S. Redline, P. Peppard (2021)
*Physiological sleep measures predict time to 15-year mortality in community adults:
Application of a novel machine learning framework.*
Journal of Sleep Research

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

*Accepted
Oral Abstracts*

Locally Optimized Random Forests, a Solution to Forecasting Severe Hurricane Power Outages
Additional Authors: Lucas Mentch, Mary Frances Dorn, Kim Kaufeld
Statistics and Data Science Symposium 2020, June 5 2020

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

Self-report And Polysomnography Sleep And Mortality In Adults: A Machine Learning Replication Analysis
Meredith L Wallace, Paul Peppard, **Tim Coleman**, Lucas Mentch, Daniel Buysse,
Martica Hall, Susan Redline, Erika Hagan
SLEEP 2020, Philadelphia PA, June 17, 2020

Talks

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.

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.

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; *Computational Statistics and Data Science*, 2020; *Artificial Intelligence*, 2021

Work Experience

Harman International

Technology Intern, Summers 2013 and 2014

Statistical Membership

American Statistical Association

Carnegie Mellon Statistical Machine Learning Reading Group

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.

Computing Languages

R, Python, ArcGIS, SAS, L^AT_EX