JAMES BUENFIL

Curriculum Vitae/Resume
buenfil@uw.edu ◇ Personal Website

EDUCATION

University of Washington, Seattle *Oct. 2020 - Present*
PhD Statistics

Relevant Coursework:
Theory: Advanced Probability Theory (MATH 521, 522), Advanced Theory of Statistical Inference (STAT 581, 582, 583)

Methods: Statistical Learning: Modeling, Prediction, and Computing (STAT 535), Multivariate Analysis (STAT 542), Advanced Regression Methods for Independent Data (STAT 570), Advanced Regression Methods for Dependent Data (STAT 571), Statistical Consulting (STAT 599)

University of Wisconsin, Madison *Aug. 2016 - May 2020*
B.S. Applied Mathematics Engineering Physics

Relevant Coursework:
Computer Science: Intro. to Optimization (CS 524), Intro. to Data Structures (CS 367), Intro. to Algorithms (CS 577), Numerical Linear Algebra (CS 513), Numerical Analysis (CS 514)
Statistics: Intro. to Stochastic Processes (STAT 632), Intro. to Statistical Inference (STAT 610)

EXPERIENCE

Grad. Research Assistant, with Marina Meila (Professor in Stat. Dept. UW-Seattle)
March 2023 - Present

- Current project is related to building interpretable, near isometric embeddings of manifolds from high-dimensional samples using a small number of user-provided dictionary functions. Developing novel theory and algorithms for this purpose.
- Working with National Security Agency (NSA) on problems related to rankings from recommender systems.

Grad. Research Assistant, with Eardi Lila (Assistant Prof. in Biostat. Dept. UW-Seattle)
May 2022 - Present

- Current project is called "Hybrid canonical correlation analysis of Riemannian and high-dimensional data." Model is motivated by the need to investigate the relationship between each subject's dynamic functional connectivity – represented by a temporally indexed collection of positive definite covariance matrices – and high-dimensional data representing lifestyle, demographic, and psychometric measures. Employing a reformulation of canonical correlation analysis that enables efficient control of the complexity of the functional canonical directions within a Riemannian framework, using tangent space sieve approximations, and that of the high-dimensional canonical directions via a sparsity-promoting penalty. Applying to data from the Human Connectome Project. Package on CRAN coming soon.

Teaching Assistant, DATA 556, Intro. to Statistics and Probability *Sept. 2022 - Dec. 2022*

- Duties include holding discussion sections for homework assignments, grading homework assignments and exams, managing the course website, and regularly answering student questions.

Grad. Research Assistant, with Marina Meila (Professor in Stat. Dept. UW-Seattle) *April 2021 - June 2021*

- Developed a novel molecular dynamics enhanced sampling method called "Tangent Space Least Adaptive Clustering," which resulted in a first-author paper accepted for poster presentation at the ICML 2021 Workshop on Unsupervised Reinforcement Learning.

Independent Study with Garvesh Raskutti (Assistant Prof. in Stat. Dept. UW-Madison) *May 2019 - Jan 2020*

- On a large amino-acid sequence dataset, applied classification methods such as Naive Bayes, logistic regression, and the PUlasso algorithm of Song and Raskutti's "PUlasso: High-dimensional variable selection with presence-only data."

Independent Study with Benjamin Peherstorfer (then Assistant Prof. in Mech. Eng. Dept. UW-Madsion) *Sep. 2017 - June 2018*

- Through Informatics Skunkworks (Machine Learning Group at UW-Madison). Ran finite element method simulations of a Navier-Stokes fluid flow problem. Polynomialized and quadraticized a tubular reactor PDE and ran numerical simulations.
- Presented on a paper called "Nonintrusive Learning of Dynamical-System Models from Data" at Skunkworks meetings.

Research Assistant, Mcdermott Physics Lab UW-Madison *Feb. 2017 - Aug. 2017*

- Assisted with testing the performance of black-box optimization algorithms. Performed a theoretical calculation of the impedance of a Josephson junction transmission line.

PUBLICATIONS

Buenfil, James, Samson J. Koelle, and Marina Meila. "Tangent Space Least Adaptive Clustering." ICML 2021 Workshop on Unsupervised Reinforcement Learning. 2021.
Buenfil, James, Eardi Lila. "Hybrid canonical correlation analysis of Riemannian and high-dimensional data." Preprint coming December 2023.
Buenfil, James, Marina Meila. "Optimal, interpretable, and low dimensional embeddings of sampled manifolds from dictionary functions." In progress.

SKILLS AND OTHER

Programming Languages:
Highly proficient: R, Python, MATLAB, Java, Julia, LaTeX

Foreign Languages:
English (native), Spanish (advanced)

Co-organizer of Geometric Data Analysis Reading Group. Link to website

ACADEMIC AWARDS

2020-22 GO-MAP Graduate Excellence Award
2020-22 ARCS Foundation Scholar