Oliver A. Orejola

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Summary

Robust problem solver with high data acumen. Formally trained in mathematics with research experience in high-dimensional probability theory, time series analysis, machine learning, and random matrix theory. Passionate about finding insight from data, building models, and learning the new and cutting edge in all things tech.

Education

Tulane University, New Orleans, LA   *Expected:* May 2024
    Ph.D. Mathematics, Advisor: Gustavo Didier Ph.D.

University of Colorado Boulder, Boulder, CO   May 2016
    B.A. Mathematics & Physics, *Magna Cum Laude*, Advisor: Elizabeth Gillaspy Ph.D.

Technical Skills and Core Competencies

Statistics	Probability Theory	Time Series Analysis	Machine Learning	Deep Learning
Python	SQL	R	Git	LaTeX
Pandas	Scikit-learn	TensorFlow	Numpy/Scipy	Microsoft Office
MLOps	Quantitative Analysis	Data Visualization	Data Wrangling	Curiosity

Research & Professional Experience

Tulane University, New Orleans, LA

    Graduate Student Researcher   Aug. 2019 - Present

    Instructor   Fall 2021 - Present
        Statistics for Scientists

    Summer Teaching Assistant   July 2022
        Game Theory

    Teaching Assistant   Fall 2018 - Spring 2021
        Mathematical Statistics, Introduction to Statistics, Introduction to Probability Theory and Statistics, Statistics for Scientists, Calculus I-II, Applied Math, Explorations in Math

Willis Towers Watson, Denver, CO

    Benefits Analyst   Oct. 2016 - July 2018

Colorado School of Mines, Golden, CO

    Quantum Computer Researcher   May 2016 - Aug. 2016

PhET Interactive Simulations, Boulder, CO

    Quality Assurance Consultant   Oct. 2013 - Feb. 2016

University of Colorado Boulder, Boulder, CO

    Undergraduate Student Researcher   Aug 2015 - May 2016
    REU Summer Researcher   May 2015 - Aug 2015

Publications

"A consistent graph Laplacian-based method for the estimation of Hurst modes" with Didier, G. (in preparation) (2024)

"On the asymptotic empirical spectral distribution of wavelet random matrices based on mixed-self-similar measurements " with Didier, G., Wendt, H. and Abry, P. (in preparation) (2024)

"On the empirical spectral distribution of large wavelet random matrices based on mixed-Gaussian fractional measurements in moderately high dimensions" with Didier, G., Wendt, H. and Abry, P. (in preparation) (2023)

"Bootstrap based test for the unimodality of estimated Hurst exponents. Performance assessment in high-dimensional analysis setting" with Lucas, C.G. Didier, G., Wendt, H. and Abry, P. (2023) *29th Francophone Colloquium Signal and Image Processing (GRETSI)*

"Shhh! The Logic of Clandestine Operations" with Naumov, P. (2023) *32nd International Joint Conference on Artificial Intelligence (IJCAI)*

"Hurst multimodality detection based on large wavelet random matrices" with Didier, G., Wendt, H. and Abry, P. (2022) *30th European Signal Processing Conference (EUSIPCO)*

"Cohomologous 2-cocycles are Homotopic 2-cocycles: k-graphs and C^*-algebras" (2016) *Undergraduate Honors Theses: University of Colorado at Boulder*

Talks/ Posters/ Presentations

Graduate Student Colloquium, Tulane University
An Introduction to Spectral Clustering	Apr. 2023
On the Empirical Spectral Distribution of Large Wavelet Random Matrices	Nov. 2022
On the Empirical Spectral Distribution for Random Matrices with Independent Rows	Oct. 2021
A simple proof of Bell's Inequalities	Nov. 2019

REMRSEC REU Poster, Colorado School of Mines
Simulation and Analysis of the Knapsack Problem in Adiabatic Quantum Computation	Aug. 2016

Thesis Defense, UC Boulder
Cohomologous 2-cocycles are Homotopic 2-cocycles: k-graphs and C^*-algebras	Apr. 2016

MAA Mathfest Presentation, Washington D.C
C^*-algebras from k-Graphs and 2-Cocycles	Aug. 2015

Programming Projects

"Cointegration and Causality: Statistical Analysis of Apple's Supply Chain"	Data Science, Tulane	Fall 2023
"Political Wikipedia Edit trends: Indicators for important events"	Intro Data Science, Tulane	Fall 2022
"Neural Nets for PDE's: Parameter to Solution map"	Deep Learning, Tulane	Spring 2022
"Predicting Horse Races"	Data Analysis, Tulane	Fall 2021
"TicTacToe: DNN Trained using a Genetic Algorithm"	Machine Learning, Tulane	Spring 2019

Workshops

Harmonic and Multifractal Analyses: from Mathematics to Quantitative Neuroscience	July 2023
CRM, Université de Montréal	
50th Probability Summer School Saint-Flour	July 2022
CNRS, Université Clermont Auvergne	

Service & Leadership

SIAM Tulane Student Chapter *Vice President*	Aug. 2020 - June 2022
Graduate Studies Student Association *Mathematics Department Representative*	Jan. 2019 - July 2022

Awards

Academic Awards
Magna Cum Laude Mathematics Honors Thesis, UC Boulder	May 2016
Dean's List, UC Boulder	Aug. 2013 - May 2016

Research Awards
Summer Research Funding, Tulane University	May 2019, May 2020, May 2021, May 2022 & May 2023
Outstanding Presentation Award, Mathematical Association of America (MAA) MathFest	Aug. 2015
Professional and Academic Conference Endowment (PACE) Award, UC Boulder	Aug. 2015