VPS Ritwika

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Computational physicist with 7+ years of experience in modelling complex biological, ecological, developmental, and social systems using theoretically grounded, data-driven techniques.

· Extensive experience in cleaning, managing, and analyzing large real and simulated data with a commitment to open science practices.
· Proven ability to learn new skills and collaborate with diverse teams across disciplines to meet the demands of the project
· Excellent science communication and data visualization skills with invited talks and contributions to several conference submissions, journal articles, and working papers
· Award winning leadership skills with positions in graduate student government, advocacy groups, and UC Merced's alumni association board (UCMAA)

Professional Experience

Affiliate researcher | Department of Communication, UCLA | 2024-present
Postdoctoral researcher | Department of Communication, UCLA | 2021-2024

· Processed, extracted, and analyzed automatically-labelled audio data and developed statistically grounded data analysis techniques informed by theories in physics and cognitive science to study infant vocal development
· Cleaned, processed, and extracted human-labelled audio data and performed extensive validation procedures
· Helped develop simulations to generate a model for infant and adult caregiver vocalization behaviors with characteristic hierarchical clustering over the course of a day
· Mentored graduate student researcher in research and science communication

Graduate student researcher | Department of Physics, University of California, Merced | 2015-2021

· Developed data analysis techniques and data-driven models to study infant vocal development, collective motion in bacteria, and predator-prey systems
· Conducted extensive literature surveys to consolidate observational data describing predator foraging behaviors for multiple predators across Africa and used this data to perform model validation
· Developed a comprehensive and pedagogically informed computational biophysics course for undergraduate and graduate students (PHYS 204) with carefully selected study systems aimed to familiarize students with fundamental biophysical principles

Education

Ph. D (Physics)
University of California, Merced
2015-2021

Integrated BS-MS (Physics)
Indian Institute of Science Education and Research, Trivandrum (IISER-TVM)
2010-2015

Technical Skills

Languages: MATLAB, R, Python, Julia, Mathematica, NetLogo, Perl, Latex

Techniques: Regression analysis, Mixed effects models, Hypothesis testing, Time series analysis, Correlation analysis, Clustering analysis, Data validation, Data visualization, Network analysis, Dynamical systems analysis and non-linear dynamics, Numerical modelling, Stochastic dynamic programming, Agent-based modelling, Linear stability analysis, Fourier analysis, Parallel computing