Tural Sadigov

U.S. Permanent Resident

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About me

Visiting Assistant Professor of Mathematics and Statistics with Ph.D. in Applied Mathematics and 7+ years experience in developing and teaching both mathematics and data-related courses such as various levels of Statistics, Machine Learning, Probability and Time Series Analysis (on Coursera) and mentoring undergraduate Machine Learning projects in Statistical Methods in Machine Learning course. Using R and RStudio extensively in all data-related course. Creator of R package stats2data for the Statistical Modeling and Applications course at Hamilton College. More detailed cv: `https://turalsadigov.github.io/cv.html`

Current and Past Positions

2020 - Visiting Assistant Professor — Hamilton College

Redesigned series of data science courses such as Statistical Analysis of Data, Statistical Modeling and Its Applications and Statistical Methods in Machine Learning by incorporating heavy coding into lectures, assessments and projects, and actively participated in data science initiatives of Hamilton College where one such initiatiuve resulted in a data science major. Sucessifully engaged students in Machine Learning projects. Played a crucial role in increasing the number of majors in mathematics and data science

2017 - Coursera Instructor — Coursera

Practical Time Series Analysis

2015 - 20 Applied Mathematics Lecturer and Math Service Coordinator — SUNY Polytechnic Institute

Promoted data analysis certificate by delivering technical lectures in various statistics and applied mathematics courses such as Applied Probability, Regression, and Time Series Analysis at undergraduate and graduate levels. .

Education

2008 - 15 Ph.D and MA, Applied Mathematics — Indiana University

Bloomington, IN

2003 - 08 BS, Mathematics — Boğaziçi University

Istanbul, Turkey

Data Science and Coding Skills

- Python, R, SQLite
- Supervised/Unsupervised Machine Learning
- Data Wrangling, Cleaning, Preprocessing & Feature Engineering
- Time Series Analysis: ARIMA, SARIMA
- Statistical Inference
- Data Visualization (ggplot)
- Communication, reporting and dashboard: Quarto, R Markdown, Jupyter Notebook, R Shiny. Sample R Shiny web app: Link to the app

Research Experience

2020, 21 Summer Research Associate — Air Force Research Lab Griffis Institute

Proved the existence of theoretical neural network solutions for differential equations, and designed and implemented numerical algorithms in Python to solve partial differential equations.

Awards/Grants

- Summer research grants, Air Force Research Lab/Griffis Institute, 2021-22 ($36000)
- Dean's Pedagogical Development Awards, Hamilton College, 2021-22 ($4500)
- Teaching Grant from Herkimer College and Hamilton College for teaching Financial Mathematics, 2022 ($10000)
- SGU Award for Excellence in Teaching, SUNY Poly, AY 2018-19
- Bronze Medal, 44th International Mathematical Olympiad, Tokyo, Japan, 2003
- Gold Medal (four times), Azerbaijan Mathematical Olympiad, 2000-03

Publications

1. Safety Prediction Model for Reinforced Highway Slope using a Machine Learning Method, 2020 (Link to the paper)
2. A Determining Form for the Subcritical Surface Quasi-Geostrophic Equation, 2019 (Link to the paper)
3. Determining form and data assimilation algorithm for weakly damped and driven Korteweg–de Vries equation — Fourier modes case, 2017 (Link to the paper)
4. A determining form for the damped driven nonlinear Schrödinger equation—Fourier modes case, 2015 (Link to the paper)

Selected mentored ML projects

1. *Does Economic Development Predict Democratization?*, With Chiara Bondi, John Madigan (Methods: Regularized Regression Models (LASSO, Ridge, Elastic-Net)), 2022
2. *A Regularized Binomial Logistic Regression Approach to Cancer Classification Using Gene Expression*, Joshua Horowitz, Mukund Jayaran (Methods: Regularized Logistic Regression), 2022
3. Predicting Career Longevity of NBA Rookies, Margaret Phipps, Luke Devine (Methods: Support Vector Machines), 2021
4. Identifying Parkinson's Disease Through Speech Patterns, Ian Nduhiu, Lindsay Gearty (Methods: Support Vector Machines), 2021
5. Predicting Housing Rent Prices Using House Characteristics, Taron Kui, Iftikhar Ramnandan, Jenny Tran (Methods: Decision Trees, Bagged Models, Random Forest), 2021
6. How Race, Income, and Education Relate to Inter- net Access in US Counties, Lindsay Gearty, Margraet Phipps (Methods: Multiple Polynomial Regression, Forward/Backward Variable Selection), 2021

Selected data-related talks

1. Theoretical Analysis of Artificial Neural Network solutions to the damped, driven Korteweg de-Vries equation, AMS Special Session, 2022
2. Support Vector Machines, CUNY - Hunter College, 2021
3. Model Selection & Validation in Machine Learning, CUNY - Hunter College, 2021
4. Support Vector Machines: Overview and Applications, CUNY - Hunter College, 2020
5. Support Vector Machines: Overview and Applications, Hamilton College, 2020
6. Stochastic Calculus: Ito Integrals and Stochastic Differential Equations, SUNY Poly, 2019
7. Stochastic Processes, Markov Chain and Brownian Motion, SUNY Poly, 2019
8. A gentle introduction to Stochastic Processes, SUNY Poly, 2019