HADISEH SAFDARI, PHD

Interdisciplinary Data Scientist

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SUMMARY

Interdisciplinary scientist with expertise in machine learning, statistical physics, and computational modeling. Skilled in applying advanced data science techniques to biological and social systems, with demonstrated leadership, collaboration, and excellent communication skills.

TECHNICAL SKILLS

- **Programming:** Python, R, SQL, FORTRAN, MATLAB, Mathematica, C.
- **Data Science Tools:** Pandas, NumPy, Scikit-Learn, PyTorch, TensorFlow, Matplotlib, Seaborn, Plotly, NetworkX, Business Intelligence tools (Power BI, Tableau).
- **Cloud Platforms:** Azure Machine Learning
- **Machine Learning:** Supervised and unsupervised learning, deep learning, anomaly detection, Bayesian inference, Markov chain Monte Carlo methods.
- **Mathematics:** Probability theory, probabilistic modeling, game theory, stochastic processes, strategic decision-making, conflict resolution, and optimization problems.
- **Software:** Git/GitHub, LaTeX, MS Office

RESEARCH EXPERIENCE

Senior Postdoctoral Researcher

Max Planck Institute for Intelligent Systems

2019 – 2024 Tuebingen, Germany

Conducted machine learning research on complex networks. Designed experiments, contributing to publications and open-source models. Supervised Ph.D. students and interns in applying data science methods.

Postdoctoral Researcher

School of Biological Sciences, IPM

2016 – 2019 Tehran, Iran

Collaborated with biologists to develop game-theoretical frameworks for metabolic pathways. Created stochastic models to study cell differentiation and proliferation.

Scientific Visitor

Delft University of Technology

2016 Delft, Netherlands

Contributed to computational models of biofilm growth using stochastic simulations.

Scientific Visitor

University of Potsdam

2014, 2015, 2018 Potsdam, Germany

Collaborated on non-equilibrium statistical mechanics nodels of biological systems.

MY LIFE PHILOSOPHY

"Action is character."

STRENGTHS

Analytical thinker
Problem-solver
Hard-working
Motivator

LANGUAGES

English ●●●●●
German ●●●●○
Farsi (native) ●●●●●

AWARD/FUNDING

The Cyber Valley Research Fund, (2021)

EDUCATION

Ph.D. Condensed Matter Physics

Shahid Beheshti University

2010 – 2015 Tehran– Iran

Thesis: How age shapes anomalous diffusion

B.S. Condensed Matter Physics

Shahid Beheshti University

2007 – 2010 Tehran– Iran

B.Sc. Solid State Physics

Guilan University

2003 – 2007 Rasht– Iran

DATA SCIENCE PROJECTS

Machine Learning Projects

Probabilistic Generative Models for Social Networks

Developed probabilistic generative models to analyze the structure of complex social networks, utilizing machine learning techniques. Implemented models for community detection and anomaly prediction in dynamic networks. [GitHub] [GitHub] [GitHub]

Anomaly Detection in Large-Scale Networks

Designed algorithms for anomaly detection in large-scale networks using unsupervised learning methods. Applied these techniques to real-world datasets to identify patterns and irregularities. [GitHub] [GitHub]

Data Analysis Using Stochastic and Statistical Physics

Stochastic Modeling of Cell Differentiation

Created a stochastic model to study the role of noise in biological systems, using Python and MATLAB. [GitHub]

Game-Theoretical Framework for Metabolic Pathways

Led a project to develop a game-theoretical framework to understand the choice of ATP-producing pathways in yeast. Applied optimization algorithms and probabilistic models to biological data. [GitHub]

Time-Series Analysis of Inflation and Unemployment Coupling

Analyzed the coupling between inflation and unemployment in the U.S. economy using Cross Wavelet Transform (CWT) and Detrended Fluctuation Analysis (DFA). Results highlight the intensity, direction, and scale dynamics of the coupling. [DOI Link]

CONFERENCE

- **7th European Conference on Social Networks**, September 2023, Ljubljana
- **6th European Conference on Social Networks**, September 2022, London
- **The Network Science Society, NetSci**, July 2022, Shanghai

WORKSHOPS & SCHOOLS ATTENDED

- Winter School on Quantitative Systems Biology, ICTS Bengaluru, 2017
- Winter School on Quantitative Systems Biology, ICTP Trieste, 2016
- School on Active Matter and Chemotaxis, IASBS-ICTP, 2016
- Hands-On Research in Complex Systems School, ICTP Trieste, 2014

COMMITTEE INVOLVEMENT

- **IMPRS-IS:** Evaluation committee, International Max Planck Research School for Intelligent Systems
- **CLS:** Evaluation committee, doctoral program of the Max Planck ETH Center for Learning Systems
- **GEP:** Gender Equality Committee, Max Planck Research School