Maryam Zamani, Ph.D.

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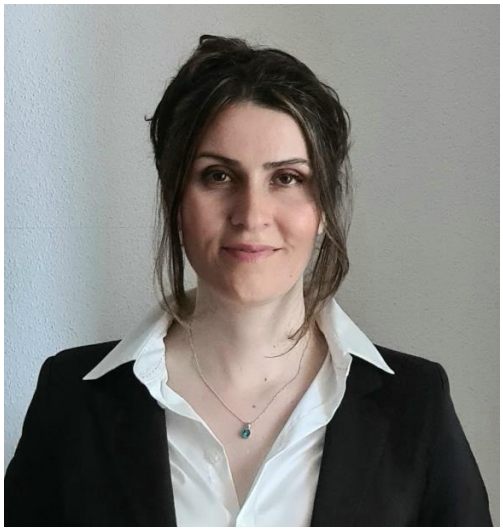
LinkedIn , GoogleScholar



Data Scientist and interdisciplinary researcher with a Ph.D. in Physics, specializing in the development and deployment of (Gen)AI solutions within the financial sector. My focus is on transforming complex business requirements into robust AI agents and analytical models, from initial data mining and prompt engineering to model selection, fine-tuning, and deployment. I have a proven track record of leading data-driven initiatives, ensuring quality assurance, and working closely with cross-functional teams and business stakeholders to drive AI transformation and deliver strategic value.

Technical Proficiencies

- **Programming Languages:** Python, SQL, MATLAB, R
- **Data Science & AI**: Predictive Modeling, Statistical Analysis, Time Series Forecasting, Anomalous Diffusion, Complex Network Analysis, NLP , Prompt Engineering, LLM Fine-Tuning, Reinforcement Learning Concepts, Complex Network Analysis, Machine Learning & Deep Learning (PyTorch, TensorFlow) , Algorithms & Data Structures
- **Tools & Platforms:** AWS (Textract, Comprehend, Sagemaker, Lambda), Large Language Models, Power BI, Linux

Professional Experience

Data Scientist- Product Management | Münchener Hypothekenbank, Munich *May 2023 – Present*

- **Real-Time Document Analysis Pipeline:** Designed and implemented a fully automated, serverless AWS solution (Lambda, S3, EventBridge) to scan land registry extracts for critical keywords, delivering immediate risk alerts to the credit department and significantly accelerating the underwriting process.
- **End-to-End NLP Document Analysis Pipeline:** Designed, constructed, and deployed an NLP pipeline to automate the classification and information extraction from legal and financial documents for loan risk assessment. This agent mimics complex business decisions, distinguishing German land register extracts with over 99% accuracy and ensuring high-quality data governance for a core business process.
- **Competitive Pricing Analysis:** Executed deep-dive statistical analysis and benchmarking of competitive pricing strategies. I collaborated closely with business stakeholders, providing data-driven insights and recommendations with Power BI to inform strategic decision-making at the leadership level.
- **Property Valuation Modeling:** Developed and deployed predictive ML models for property valuation based on geolocation data. This involved defining data requirements with engineering teams and creating a scalable analytical framework that serves as a core business application.

Visiting scientist | Berlin Institute for the Foundation of Learning & Data (Max Planck Institute), Berlin *Jan 2022 – April 2023*

- Investigated the application of stochastic modeling to understand and predict the behavior of stock prices, focusing on deviations from standard models during periods of high volatility.
- Modelling the evolution, spread and transformation of scientific knowledge in the early modern period using a dataset of text books.

Visiting Scientist | Max Planck Institute for the Physics of Complex Systems, Dresden
Feb 2019 – Dec 2021

- Led a research project on deep learning for time series forecasting, applying advanced modeling techniques to large-scale climate data.
- Pioneered the use of multi-layer network analysis to model the evolution of information in complex systems, a technique applicable to understanding the performance of distributed systems.
- Conducted statistical analysis of citation patterns in scientific publications.

Postdoctoral Fellow | Hungarian Academy of Science & Eötvos Lorand University, Budapest
Jan 2016 – Dec 2018

- Modeled the stability and emergence of hierarchies in complex social networks using Monte Carlo simulations.
- Analyzed behavioral patterns in large datasets from public and dark web forums.

Visiting Researcher | University of Texas at Austin *Feb 2014 – Aug 2014*

- Analytical modelling of statistical properties (e.g., correlation function) of rough surfaces using light scattering.

Education

- **Ph.D. in Physics** | Shahid Beheshti University, Tehran (*2010–2014*)
- **M.Sc. in Physics** | Shahid Beheshti University, Tehran (*2008–2010*)
- **B.Sc. in Physics** | Tabriz University, Tebriz (*2002–2007*)

Selected Publications

- **M. Zamani**, E. Aghion, P. Pollner, T. Vicsek, H. Kantz, Anomalous Diffusion in the Citation Time Series of Scientific Publications. Journal of Physics: Complexity 2, 035024 (2021).
- **M. Zamani**, A. Tejedor, M. Vogl, F. Kräutli, M. Valleriani and H. Kantz, Evolution and Transformation of Early Modern Cosmological Knowledge: A Network Study. Scientific Reports 10, 19822 (2020).
- **M. Zamani**, F. Rabbani, A. Horicsany, A. Zafeiris, T. Vicsek, Difference in structure and dynamics of networks retrieved from dark and public web forums, Physica A 525, 326 (2019).
- **M. Zamani**, L. Camargo-Forero, T. Vicsek, Stability of glassy hierarchical networks, New Journal of Physics 20, 023025 (2018).
- **M. Zamani**, T. Vicsek, Glassy nature of hierarchical organizations, Scientific Reports 7, 1382 (2017).
- **M. Zamani**, F. Shafiei, S. M. Fazeli, M.C. Downer, G.R.Jafari, Analytic height correlation function of rough surfaces derived from light scattering, Physical Review E 94, 042809 (2016).
- S. Mehraban, A.H. Shirazi, **M. Zamani**, G.R. Jafari, Coupling between time series: A network view, Europhysics Letters 103, 50011 (2013).
- Additional publication in my GoogleScholar

Languages

English (full professional proficiency), German (C1), Farsi (native)