# Hadi Mohammadi

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## EDUCATION

**Utrecht University**                                                                Utrecht, The Netherlands
*Ph.D. in Explainable Natural Language Processing for Social Sciences*              *Feb 2023 − Present*
*Faculty of Social and Behavioral Science, Department of Methodology & Statistics*

**Member of:** M&S Natural Language and Text Processing (*NLTP*) group and Human Data Science (*HDS*) Lab

**Supervisors:** Dr. Ayoub Bagheri, Dr. Anastasia Giachanou, and Prof. Dr. Daniel Oberski

**Projects:**

- Review on Explainable Natural Language Processing with a Focus on Applications
- Explainable Sexism Detection in Social Media Considering Human Rationalizations.
- Explainable AI-Generated Text Detection using Ensemble training and Meta-Learning
- Assessing Reliability of Annotations in the Context of Model Predictions and Explanations

**University of Tehran** (Best University in Iran based on U.S. News)                          Tehran, Iran
*M.Sc. in Industrial Engineering—Macro Systems; **GPA: 18.96/20 (4/4)***         *Sep 2018 − Apr 2021*

**Thesis:** "Dynamic pricing with demand learning using reinforcement learning in the non-stationary environment by considering customer behavior and Advertisement (A Data-driven Approach)"

**Isfahan University of Technology,** Golpayegan College of Engineering                    Isfahan, Iran
*B.Sc. in Engineering;  **Last 2years GPA: 15.98/20 (3.35/4)***                    *Sep 2011 − Jul 2016*

## SKILLS

**Research Interests:** Specialize in Natural Language Processing and Explainable AI, focusing on fairness in machine learning. Proficient in Generative AI, Reinforcement Learning, and Human-AI Collaboration. Expert in Data-Driven Decision Science and Optimization methods.

**Technical Skills:** Advanced in Python, R, and SQL. Skilled in version control with Git. Experienced in TensorFlow, PyTorch, Scikit-learn, and similar frameworks for Machine Learning, ETL processes, and Data Warehouse Management using Microsoft Visual Studio. Familiar with cloud technologies like Microsoft Azure, as well as known Big Data tools like Apache Hadoop. Proficient in LaTeX. Understanding the architecture and application of large language models like GPT, BERT, and others.

**Analytical Tools:** Skilled in data visualization in Python (Matplotlib, Seaborn, Folium) and analytics using Microsoft Power BI. Proficient in statistical tools like EViews for data processing and analysis tasks.

**Soft Skills:** Exceptional in Critical Thinking and Adaptability with a proven track record in Problem-Solving. Known for Perseverance and Attention to Detail. Strong collaborator and effective in Teamwork environments.

**Language Proficiency:** Native in Farsi, Advanced proficiency in English, and learning Dutch.

## GRANTS & AWARDS

**The focus area Applied Data Science Grant (Utrecht University), €7.5K:** Project on "Assessing Reliability of Annotations in the Context of Model Predictions and Explanations" in collaboration with Dr. Pablo Mosteiro Romero, Dr. Anastasia Giachanou, and Prof. dr. Massimo Poesio, (Dec 2023).

**Scholarship for Admission:** the Explainable AI (XAI) Summer School TU Delft, The Netherlands, (Aug 2022).

**Ranked $2^{nd}$ of graduate student:** Among more than 50 graduate students of Industrial Engineering at the University of Tehran, (Apr 2021).

**Best Paper Award:** in the second national conference of the Iranian System Dynamics Society, (2019)

**Ranked $35^{th}$:** in the nation Iranian university entrance exam for Master of Industrial Engineering among more than 10K participants, ( Sep 2018).

**Semifinalist:** in the National Mathematical Olympiad during all high school in Iran, (2009).

## TEACHING EXPERIENCE

**Transformers Workshop, University Medical Center Utrecht**                       Utrecht, The Netherlands
*Practical Assistant*                                                                        *Dec 2023*

- Supervised practical sessions in Python alongside Dr. Ayoub Bagheri and Prof. Dr. Albert Gatt

**Data Wrangling and Data Analysis, Utrecht University**                           Utrecht, The Netherlands
*Computer Lab Assistant*                                                            *Sep 2023 − Oct 2023*

- Assisted in the Master in Applied Data Science (*ADS*)course, focusing on R for Data Visualization, EDA, Supervised Learning, and Text Mining.

### Econometrics, University of Tehran
Tehran, Iran
*Lead Teacher Assistant (four Semesters)*
*Sep 2019 – Oct 2022*
- Coordinated projects, monitored assignments, and graded papers for over 20 M.Sc. students under Prof. Dr. Farid Ghaderi.

### Data Mining, Sharif University of Technology
Tehran, Iran
*Graduate Research Assistant*
*Oct 2021 – Jan 2022*
- Managed projects and provided feedback for M.Sc. students under Dr. Majid Khedmati.

### Dynamic Programming, University of Tehran
Tehran, Iran
*Graduate Research Assistant*
*Oct 2021 – Jan 2022*
- Guided M.Sc. and Ph.D. students' projects, offering weekly support and grading under Dr. Zeinab Sazvar.

### Deep Learning Summer School, Neuromatch Academy
Los Angeles, USA (Remote)
*Lead Teacher Assistant*
*Aug 2021 – Sep 2021*
- Facilitated international student learning and coordinated with mentors and organizers.

### Linear Algebra, University of Tehran
Tehran, Iran
*Teacher Assistant*
*Jan 2020 – Jun 2020*
- Led tutorials and graded assignments for BSc students under Dr. Zeinab Sazvar.

### AI in Geospatial Data, Sharif University of Technology
Tehran, Iran
*Course Instructor*
*Sep 2019 – Jan 2020*
- Instructed M.Sc. students in AI applications in Geospatial Data using Python.

### Introductory Data Science,University of Tehran
Tehran, Iran
*Python Instructor*
*Sep 2019 – Dec 2019*
- Developed course material and tutored students in Data Science fundamentals and Python programming.

## RESEARCH EXPERIENCE

### Institute for Artificial Intelligence, Isfahan University of Technology
Isfahan, Iran
*Machine Learning Specialist*
*Jan 2021 – Jun 2021*
- Led a key project on dynamic pricing in house price prediction in Iran, utilizing advanced machine learning algorithms. Developed predictive models to analyze market trends and factors influencing house prices. This work involved extensive data collection, cleaning, and analysis to ensure accuracy in predictions. Successfully implemented a model that improved pricing strategy efficiency by 5%, significantly enhancing real estate investment decision-making.

### School of Electrical and Computer Engineering, University of Tehran
Tehran, Iran
*Cognitive Science Researcher*
*Feb 2019 – Jul 2019*
- Collaborated with the Cognitive Science and Technologies Council under Prof. Dr. Majid Nili Ahmad Abadi. Worked on projects involving the collection and analysis of social media data to understand discourse and behavior in Iranian society during the Covid crisis.

## ADDITIONAL PROFESSIONAL DEVELOPMENT

### Machine Learning Summer School, University of Oxford
Oxford, UK
*Specialization in Finance & NLP/Health*
*May 2023 – Jul 2023*
- Participated in an intensive program focusing on the latest advancements in Machine Learning, with a special emphasis on applications in Finance and Natural Language Processing in healthcare.

### Explainable AI (XAI) Summer School, TU Delft
Delft, The Netherlands
*Focus on Post-hoc Interpretability in ML*
*Aug 2022*
- Engaged in advanced studies on explainable AI, covering topics like post-hoc interpretability, representation learning, and human-centric explainability in machine learning.

### Executive Master in Finance (EMFin), Sharif University of Technology
Tehran, Iran
*One-Year Comprehensive Finance Program*
*Nov 2021 – Nov 2022*
- Completed a rigorous year-long program, gaining in-depth knowledge and practical skills in various aspects of finance, including corporate finance, investment strategies, and financial analysis.

## WORK EXPERIENCE

### SnowaTec (Innovation Center) – Entekhab Electronic
*Data science consultant / Customer Behavior*

Tehran, Iran; Full-time
*Dec 2022 – Mar 2023, (4 month)*

Consulted on data collection, warehouse building, and management dashboard creation, enhancing customer experience for Iran's leading home appliance manufacturer.

*Medior Data Scientist / Customer Behavior*

*Dec 2021 – Dec 2022, (12 months)*

- Managed data warehouse using ETL tools, improving data accessibility by 16%.
- Developed KPIs and customer satisfaction index, resulting in a 2% increase in satisfaction.
- Created Power BI dashboards to enhance data-driven decision-making at various management levels.
- Implemented ML algorithms for customer segmentation, boosting targeted marketing and customer experience by 7.5%.

### Upwork.com (Freelance Platform)
*Data Scientist & Machine Learning Specialist*

Freelance; Full-time
*Sep 2020 – Apr 2021, (8 months)*

- Specialized in customer behavior analysis and home credit default risk for online retail clients.

### Bdood.bikes (Shared Bicycle System)
*Medior of Data Science and Business Intelligence*

Tehran, Iran; Full-time
*Apr 2020 – Oct 2020 (7 months)*

- Implemented dynamic pricing and ML-based user predictions, increasing revenue and rider experience by 5%.
- Developed Power BI, Streamlit, and DashPlotly dashboards, enhancing customer engagement by 3%, efficiency by 7%, and space utilization by 11%.
- Optimized transportation intelligence, reducing maintenance and relocation costs by 8% and 3%, respectively, while improving system performance by 2.7%.
- Conducted user behavior analysis, leading to a 4.5% increase in customer retention.

*Junior Data Scientist*

*Jul 2019 – Apr 2020 (10 months)*

- Led predictive maintenance analysis and battery health algorithm development, reducing downtime by 3.8% and extending battery life.
- Utilized GIS models to analyze user behavior and high-risk riders, enhancing customer safety and experience by 3% and 5%, respectively.
- Provided marketing and business analytics insights, contributing to a 6% growth in revenue and customer engagement.

### Amin Cultural Educational Institute
*Strategic Planning Specialist*

Isfahan, Iran; Full-time
*Jan 2016 – Feb 2017 (14 months)*

- Formulated and executed long-term and short-term organizational strategies, achieving a 1% growth in company performance.
- Collaborated with external stakeholders, including educational institutes, to expand partnerships and enhance organizational reach by 3%.

## PUBLICATIONS

**Mohammadi, H.**, Bagheri, A., Giachanou, A., & Oberski, D. (2023). Explainability in Practice: A Survey of Explainable NLP Across Various Domains. (In preparation).

**Mohammadi, H.**A., Giachanou, A. Bagheri,(2023). Developing Transparent Methods for Identifying Sexism in Social Media: Combining Explainability with Human Rationalizations. (Submitted to) CLIN Journal

Mirabnejad, M., **Mohammadi, H.**, Mirzabaghi, M., Aghsami, A., Jolai, F., & Yazdani, M. (2022). Home Health Care Problem with Synchronization Visits and Considering Samples Transferring Time: A Case Study in Tehran, Iran. International Journal of Environmental Research and Public Health, 19(22), 15036.

**Mohammadi, H.**(2022). Statistical Reinforcement Learning with Application in Dynamic Pricing Problem: Learning from Customer Interaction based on Bayesian Approach. Tehran: Arshadan Publication.

## Conference

**Mohammadi, H.**, Giachanou, A., & Bagheri, A. (2023). Towards Explainable AI-Generated Text Detection Using Ensemble and Combined Model Training. IOPS 2023 winter conference, Amsterdam, The Netherlands.

**Mohammadi, H.**, Giachanou, A., & Bagheri, A. (2023). Towards Explainable Sexism Detection in Social Media: An Ensemble Approach with Human Rationalizations. The 33rd Meeting of Computational Linguistics in The Netherlands (CLIN 33), Antwerp, Belgium.

**Mohammadi, H.**, Giachanou, A., & Bagheri, A. (2023). Towards Robust Online Sexism Detection: A Multi-Model Approach with BERT, XLM-RoBERTa, and DistilBERT for EXIST 2023 Tasks. CLEF 2023 Conference and Labs of the Evaluation Forum, Thessaloniki, Greece.

**Mohammadi, H.**(2022). Neural network hyperparameter tuning with Bayesian optimization and comparison of its results to traditional machine learning methods. 2nd International Conference on Computer Engineering and Science, Najafabad.

**Mohammadi, H.**& Ardestani, M. (2022). Identification and behavioral analysis of high-risk riders of shared bicycles using artificial intelligence in geospatial data. 6th International Conference on Entrepreneurship and Industrial Engineering, Tehran, Iran

**Mohammadi, H.**& Khedmati, M. (2022). Bitcoin world price forecasting with time series analysis and machine learning approach. 6th International Conference on Entrepreneurship and Industrial Engineering, Tehran, Iran.

**Mohammadi, H.**& Ghaderi, S. F. (2021). Investigation of Economic and Social Factors Affecting Population Growth in Iran: An Econometric Approach. 18th Iranian International Industrial Engineering Conference, Tehran, Iran.

Akrami, E., **Mohammadi, H.**, & Sheikh Alishahi, M. (2021). Discrete Simulation of Hospital Patient Service System. 18th Iranian International Industrial Engineering Conference, Tehran, Iran.

**Mohammadi, H.**Akrami, E., Navidi, S., & Asadollah Nejad, P. (2019). A dynamic model for investigating the role of smoking on the incidence of lung cancer with a social policy approach. National Conference of the Iranian System Dynamics

## Presentations

A Journey on Explainable Natural Language Processing (NLP) in social science applications, Human Data Science content-oriented meeting, Utrecht University, 5 Oct 2023, Utrecht, the Netherlands.

A Journey on Explainable Natural Language Processing (NLP) in social science applications, AI-lab users meeting, Utrecht university, 9 Nov 2023, Utrecht, the Netherlands.

AI-Generated Text Detection Using Ensemble and Combined Model Training, CLIN conference, UAntwerpen, 22 Sep 2023, Antwerp, Belgium.

Skills Lab: Introduction to Transformers BERT and Explainable NLP, M&S Research Hay Day 2023, with *Dr. Huyen Nguyen* and *Daniel Anadria* Utrecht University, 2 Jun 2023, Utrecht, The Netherlands.

## Selected Projects

**Automatic Detection of AI-Generated Texts** – CLIN33 Shared task | *GitHub*
**Sexism Detection in Social Media** – EXIST 2023 Competition | *GitHub*
**Better then Bing** – XAI competition| *GitHub*
**Interpretable Analysis of Financial Fraud Data** – Sharif University of Technology | *GitHub*
**Bicycle transportation intelligence** – Bdood.bikes | *GitHub*
**Recommendation System using Autoencoders** | *GitHub*

## Relevant Coursework

**Summer school Course:** AI-Aided Systematic Reviewing, Data Science: Applied Text Mining, A gentle introduction to Bayesian Estimation.

**Workshops:** PhACE (PhD Activating Career Event), Working Consiously & Effectively, Research Funding Day, influencing & conflict style, Smoothening your Writing Process.

## Organizations

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| Interuniversity Graduate School of Psychometrics and Sociometrics (IOPS) | Dec 2023 – Present |
| Young Complexity Researchers Utrecht (YCRU) | Nov 2023 – Present |
| Young Statisticians Netherlands | Mar 2023 – Present |
| Open Science Community Utrecht (OSCU) | Feb 2023 – Present |

## References

References available upon request.