Berke Akkaya

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Education

University of Passau   **Sep. 2024– Present**
Researcher in Data and Knowledge Engineering Chair   *Passau, Germany*
Research Topic: Enhancing a Large Language Model Based Knowledge Graph Attention Network Model for Recommendation Systems

Istanbul University   **Sep. 2021– Present**
PhD in Quantitative Methods   *Istanbul, Turkey*
Research Topic: Developing a Content-Aware Product Recommendation System Based on Natural Language Processing

Istanbul University   **Sep. 2018– June 2021**
MSc in Quantitative Methods   *Istanbul, Turkey*
Research Topic: Analyzing User Interactions of an E-Commerce Website with a Pay-Per-Click Model

Istanbul University   **Sep. 2014– June 2018**
BSc in Business   *Istanbul, Turkey*

Relevant Interests

- Machine Learning
- Explainable AI
- Statistical Modeling
- Recommender Systems
- Large Language Models
- Deep Learning

Experience

Istanbul University   **November 2020 – Present**
Research and Teaching Assistant   *Istanbul, Turkey*

- Created supplementary learning materials, including video tutorials and interactive coding exercises, to reinforce key concepts and enhance student engagement; materials are used by 200+ students.
- Developed and co-taught course material on model-agnostic interpretability and regional explanations.
- Supervised student projects on model evaluation and interpretability.

Istanbul Arel University   **May 2019 – November 2020**
Research and Teaching Assistant   *Istanbul, Turkey*

- Assisted in statistical courses, focusing on model assessment and data preprocessing.
- Coordinate the students' learning agreements with ERASMUS+.
- Collaborated with the Quality Assessment team and identified 5 key areas for improvement, leading to the university's successful acquisition of a government-approved quality certificate valid for 3 years.

Turkiye Is Bankası   **June 2017 – August 2017**
Digital Banking Intern   *Istanbul, Turkey*

- Collaborated with a team of bank experts and trainees on the bank's credit card application and delivery process.
- Prepared a project for the Bank management to improve customer processes.
- Received classroom training on Design Thinking, Finance, and Presentation Skills in English.

Technical Skills

Languages & Libraries: Python (Pandas, NumPy, Scikit-learn, PyTorch, TensorFlow), R (caret, randomForest, ggplot2), SQL
Analytical Tools: SPSS, KNIME, Weka, MS Excel
Developer Tools: Git, GitHub
Statistical Techniques: Regression, Classification, Feature Selection, Hypothesis Testing, Recursive Feature Elimination
Machine Learning: Supervised/Unsupervised Learning, Ensemble Learning, Deep Learning, Model-Agnostic Interpretability Methods

Projects and Research

Sustainability of Cities and Field Applications   **2023-2024**
Tools: Python, SPSS
- Research on an RnD project funded by Istanbul University, focusing on machine learning models for sustainability and urban planning.

Spotify Recommendation System   **2023**
Tools: Python
- This project developed a content-based Spotify recommendation system using Python and the Spotify API, leveraging cosine similarity on standardized audio features to recommend the top 10 similar songs based on a user-selected track.
- Published on GitHub

H&M Recommendation System   **2023**
Tools: Python
- This project developed a collaborative filtering recommendation system for H&M using Python and language models, recommending the top fashion items per customer based on transaction data.
- Published on GitHub

Sentiment Analysis of Poe's Corpus   **2023**
Tools: Python
- This project conducted sentiment analysis on Edgar Allan Poe's short story corpus using Python and VADER, quantifying emotional tones through sentiment scores and visualizing trends with word clouds and plots.
- Published on GitHub

The Mediator Role of Economic Freedom in the Effect of Corruption Perception on National Happiness   **2022**
Tools: Python
- The research examined the impact of perceived corruption on national happiness in 150 countries between 2012 and 2020 and revealed the mediating role of economic freedom in this relationship.
- Published on: Izmir Journal of Economics, 37(3), 760-777.

Global Vaccination Inequality and The Factors That Affect This in The Context of COVID-19   **2022**
Tools: R, SPSS
- The research analyzed global vaccination disparities during COVID-19, identifying political, economic, and demographic factors influencing vaccine access across 88 countries.
- Published on: Hacettepe Journal of Health Administration, 25(1), 17-28.

A Comparative Study of Heart Disease Prediction Using Machine Learning Techniques   **2022**
Tools: Python
- This research compared machine learning methods on CDC BRFSS 2020 data, achieving up to 0.89 accuracy with XGBoost for heart disease prediction after addressing data imbalance with SMOTE-Tomek.
- Published on: 2022 International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA). IEEE.

The Effect of Recursive Feature Elimination with Cross-Validation Method on Classification Performance   **2021**
Tools: Python, R
- This research evaluated the impact of recursive feature elimination with cross-validation on nine classification algorithms across five datasets, achieving an average accuracy increase of 0.05 and reduced fit time by 5.1 seconds.
- Published on: 4th International Conference on Data Science and Applications, 142-145.

Comparison Of Multi-Class Classification Algorithms on Early Diagnosis of Heart Diseases   **2019**
Tools: Python
- This research compared nine multi-class classification algorithms on a UCI cardiotocography dataset, achieving a peak accuracy of 0.88 with Random Forest for early heart disease diagnosis.
- Published on: Y-Bis 2019 Conference: ISBIS Young Business and Industrial Statisticians Workshop on Recent Advances in Data Science and Business Analytics, 162-172.