MUSTAFA ASLAN

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EDUCATION

PhD Research Student in Business Studies | Cardiff University, Cardiff, Wales, UK **10/2024 – 06/2028**

- PhD research project: Enhancing discharge care coordination in healthcare and social care using a probabilistic data-driven modelling approach

MSc in Financial Mathematics | Middle East Technical University, Ankara, Turkey **09/2017 – 10/2021**

- MSc thesis: Effects of Exchange Rate Volatility and Firm-Specific Features on the Rates of Returns of the Manufacturing Firms Listed in Borsa İstanbul: A CAPM Approach
  (Thesis link: https://hdl.handle.net/11511/93166)
  - Statistical&Machine learning techniques used: Markov Switching GARCH Models, ARIMA, Panel Data Econometrics, Principal Component Analysis

BSc in Business Administration | Middle East Technical University, Ankara, Turkey **09/2011 – 08/2015**

PROFESSIONAL EXPERINCE

Reporting and Analytics Executive | AKBANK (a leading bank in Turkey) **06/2022-09/2024**

- Applied time-series forecasting and machine learning techniques, including ARIMA, Bayesian Time Series, Prophet, ANN, LSTM, Random Forest, LightGBM and XGBoost, to historical data for making long-horizon forecasts of daily customer call volume. The best model achieved over 94% accuracy (1-MAPE) in forecasting all days of the next month.
- Implemented machine learning models (e.g., XGBoost, LightGBM, CatBoost) to predict customer behavior with an over recall rate of 70% and an accuracy rate of 85%, enabling fewer customer complaints and increase sales by 14%.
- Analyzing large amounts of data to identify trends and find patterns, signals and hidden stories within customer calls data.
- Applied machine learning techniques (Z-score, IsolationForest) to detect anomalies.
- Applied unsupervised machine learning techniques (DBSCAN, Gaussian mixture, K-means) to cluster customers.
- Hyperparameter tuning for machine learning models using Hyperopt, Optuna and KerasTuner.

Research Associate | the Economic Policy Research Foundation of Turkey (Think Tank) **01/2022-04/2022**

- Determined areas of research to increase knowledge in the particular field.
- Utilizing inferential statistics such as hypothesis testing (e.g., t-test, ANOVA test, population proportion test), confidence intervals, correlation analysis and regression analysis to make inferences and draw conclusions about data.
- Developed statistical models (regression analysis, panel data modeling) for regional development projects to contribute to data-driven decisions.

Senior Process Development Analyst | ETI GIDA Inc (a major FMCG player in Turkey) **06/2019-01/2022**

- Interacted with internal customers to understand business needs and translate into requirements and project scope.
- Assessed the impact of current business processes on users and stakeholders and evaluated potential areas for improvement.
- Maintained strong working knowledge of ERP (SAP), CRM and business intelligence tools and operational features.

Internal Auditor | Turk Telekom Inc. (the telecom giant of Turkey) **11/2015-06/2019**

- Performed strategic planning, execution and finalization of audits using data analytics and critical thinking skills.
- Investigated discrepancies discovered during the auditing process.
- Recommended new methods to improve internal controls and operating efficiency.

RESEARCH INTERESTS

- Healthcare analytics
- Data-driven decision making
- Time series forecasting
- Probabilistic forecasting
- Conformal prediction for time series forecasting
- Machine learning

TECHNICAL SKILLS

- **Languages/Tools:** Python, R, SAS, SQL, Advanced Excel, QlikView
- **Libraries:** Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn, Statsmodels, PyMC3, Tensorflow, pytorch-forecasting, Darts, Statsforecast, XGBoost, LightGBM, CatBoost, Hyperopt, Kerastuner
- **Stats & Experimentation:** explanatory data analysis (descriptive statistics, histogram, boxplot), hypothesis testing (t-test, ANOVA test, population proportion test), correlation analysis, Time-Series Analysis (decomposition, moving averages, exponential smoothing, ADF and KPSS tests for testing stationarity, Fourier transformation for additional seasonal component)
- **Machine Learning:** Time-Series Forecasting (ARIMA, SARIMAX, PROPHET, TBATS, LSTM, NHITS, NBEATS, ES-RNN), Classification&Regression (Random Forest, XGBoost, LightGBM, CatBoost, Logistic Regression, Linear Regression, GLM, l1&l2 Linear Regression, Bayesian Modeling), NeuralNets, Principal Component Analysis, Clustering (DBSCAN, Gaussian mixture, K-means), Anomaly Detection (Z-score, IsolationForest, Local Outlier Factor)

PROFESSIONAL DEVELOPMENT

- **Certification:**
  - **Data Science: Machine Learning, HarvardX (edX)** (https://courses.edx.org/certificates/f1ae5e21826241a5ad7ebb4de58dabb4)
- **Books (some of my go-to books):**
  - Forecasting: Principles and Practice (Hyndman et al, 2021)
  - Analysis of Financial Time Series (Tsay, 2010)
  - Introduction to Statistical Learning with Applications in R (Tibshirani et al, 2019)
  - The Elements of Statistical Learning (Tibshirani et al, 2008)
  - Probabilistic Machine Learning: An Introduction (Murphy. 2022)
  - Time Series Forecasting in Python (Peixeiro, 2022)
  - A Student's Guide to Bayesian Statistics (Lambert, 2018)
  - Dive into deep learning (Zhang, 2022)