

SADAT MAHMUD

Data Scientist

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PROFILE

Analytical Data Scientist and former Business Analyst with strong foundations in machine learning, statistical modeling, and data-driven decision-making. Proven impact includes a 10% regional revenue increase through predictive pricing models and development of regression models achieving an R^2 of 61.2%. Skilled in Python, SQL, and BI tools, with experience leading cross-functional teams, including a top 6% finish (5th of 94 teams) in a competitive business simulation. Passionate about turning complex data into actionable business strategy.

ACADEMIC BACKGROUND

01/2021 - Today — **Data Science (M.Sc.), TU Dortmund, Dortmund (Full-time studies, part-time work alongside studies)**

Coursework: Statistical Learning for Big Data, Applied Bayesian Data Analysis, Statistics in Genetics, etc.

04/2024 - 10/2024 — **Computational Neurology (Exchange Program), Ruhr-University, Bochum**

Coursework: Applied time series analysis and statistical modelling to detect epilepsy; Grade: 2.3 (German Scale).

09/2023 - 10/2023 — **Advanced Data Analytics (Erasmus+), University of Naples, Italy**

Coursework: Focused on applied analytics techniques in a cross-cultural setting; Grade: 2.3 (German Scale).

01/2014 - 04/2018 — **Electrical and Electronic Engineering (B.Sc.), AIUB, Bangladesh**

Grade: 2.74 (North American Scale).

SKILLS

Languages: German (B1), English (C1), Bengali (Native)

Programming, Data Visualization & BI: Python (Pandas, NumPy, Scikit-learn), R (Tidyverse, brms), SQL (PostgreSQL), C, C++, Power BI, Tableau, Excel, PowerPoint

Statistical Techniques: Statistical Testing, Statistical Modelling, Exploratory Data Analysis (EDA)

Tools and Platforms: Microsoft Fabric (Lakehouse, Warehouse, Dataflows Gen2, PySpark), Jira, Confluence, DAX, Power Query, MS Azure

Soft Skills: Cross-functional Collaboration, Workflow Prioritization, Strategic Leadership, Team Collaboration, Analytical Troubleshooting & Critical Thinking.

ACADEMIC PROJECTS AND CASE STUDIES

01/2026 - Ongoing — **AI-Powered Real-Time News & Sentiment Aggregator**

- Built a full-stack application to bridge unstructured web data with actionable sentiment insights for real-time news monitoring. Developed a data pipeline and interactive dashboard using React and APIs. Applied NLP models including VADER and Transformer-based BERT for sentiment analysis.
- Currently designing the API service layer and frontend architecture, focusing on optimizing real-time data ingestion for end-to-end visualization.

10/2025 — **Simulation-Based Inference (SBI) for LIF Neuron Activation & Parameter Estimation**

- Applied simulation-based inference to estimate neuronal membrane parameters (time constant and resistance) from noisy voltage data using LIF models. Built a deep learning pipeline with a 4-layer MLP and Normalizing Flows for feature learning and posterior estimation.
- Evaluated model performance using SBC and parameter recovery tests, achieving strong correlation ($r \approx 0.83$) between predictions and ground truth, indicating reliable estimation accuracy.

10/2024 — **Car Price Prediction Using Bayesian GLM (Gaussian) with brms in R, leveraging probabilistic inference**

- Applied Bayesian Generalized Linear Models (R, brms package, Normal (0.3) priors) to analyze pricing determinants for BMW, Audi, and Toyota vehicles.

- Validated via posterior predictive checks and WAIC comparison. Identified the BMW-model as superior with a WAIC of 196.4 (vs. 237.3 and 235.5), indicating optimal fit and complexity.

10/2024 — Concrete Compressive Strength Analysis Using Regression

- The project aimed to develop a robust regression model to predict the compressive strength of concrete based on its material composition and curing age.
- Applied feature selection techniques including Best Subset Selection, AIC/BIC, and VIF diagnostics in Python, achieving a model performance of 61.2% R^2 .

02/2024 — Statistical Analysis of Airbnb Pricing

- The project aimed to investigate the relationship between host response times and property pricing using a dataset of 232 Airbnb listings in Seattle.
- Ran a one-way ANOVA with Tukey's HSD and Bonferroni corrections; found faster host responses led to 23% higher prices on average ($p = 0.0219$).

01/2024 — Demographic Trends & Mortality Analysis

- Analyzed population data from 227 countries, using heatmaps and scatter plots to visualize the relationship between median age and infant mortality; found a strong negative correlation (-0.80), indicating that older populations tend to have significantly lower infant mortality rates.

11/2017 — Bachelor Thesis: Electricity Generation Using a Three-Chamber Microbial Fuel Cell

JOB EXPERIENCE

06/2018 - 02/2019 — Business Analyst (Market Research and Price Analysis); Infolink Limited, Dhaka, Bangladesh

- Team Leadership:** Directed a team of 10 analysts to optimize market research operations and pricing strategies, resulting in the successful delivery of 20+ data-driven reports.
- Customer Insights & CRM:** Leveraged Microsoft Dynamics CRM to manage client data and streamline research workflows, improving overall project turnaround time.
- Predictive Analytics:** Utilized Python (Pandas, Scikit-learn) for Exploratory Data Analysis (EDA) and statistical modelling to forecast market trends.
- Revenue Optimization:** Developed regression-based pricing models and executed A/B testing, contributing to a 10% increase in regional revenue.
- Data Visualization:** Designed interactive dashboards in Excel and Power BI to present complex pricing insights to senior stakeholders.

EXTRACURRICULAR ACTIVITIES

05/2026 - 06/2026 — Participant, Westenergie Manager Cup, Dortmund, Germany

- Secured 5th place out of 94 competing teams in a high-pressure, real-time business simulation (TOPSIM).
- Collaborated in an interdisciplinary team of engineers and managers to execute strategic decisions across marketing, production, HR, finance, and R&D.
- Leveraged data-driven decision-making to perform in the top 6% of participants, qualifying for the Champions League round in Essen.

10/2024 - Today — Participant, D-LAB

- Interdisciplinary certificate program in Digital Technology Management focused on entrepreneurship.
- Partnered with a diverse cohort of peers to transform early-stage startup concepts into actionable business models, fostering cross-functional leadership and project management capabilities.

04/2024 — Centrum für Entrepreneurship & Transfer

- 2nd place for the implementation of AI-based travel solutions at the TU Startup Weekend among 20+ teams.

Sabat

05 July 2026