

NIMESH JITENDRA BHAVSAR

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Date of Birth: 01 April 2002 | Nationality: Indian | Location: Dortmund, Germany (open to relocation)

EXPERIENCE

MuSigma Inc.

Decision Scientist

Bengaluru, India

July 2024 - July 2025

- * Developed **Enterprise RAG systems** for Fortune-50 client, improving response accuracy and contextual relevance through advanced retrieval optimization, semantic search, and intelligent context orchestration.
- * Developed **Agentic AI** workflows for automated document parsing and intelligent information extraction using specialized LLM agents, reducing manual processing effort by 15% and improving operational efficiency.
- * Conducted **A/B testing** on embedding models and context windowing strategies to reduce hallucinations and improve factual consistency in enterprise-scale LLM applications.
- * Designed and optimized a **Predictive Customer Churn Model** using PyTorch and XGBoost, improving customer retention strategies and outperforming existing benchmark models through advanced feature engineering and model tuning.
- * Optimized AWS cloud data contents through efficient storage tiering algorithm, delivering a validated projected annual cost saving of **\$1,8 Million**.

EDUCATION

Technical University Dortmund

Master of Science in Data Science, Grade: 2,1/5

Dortmund, NRW, Germany

October 2025- Present

- * **Credits Completed:** 32
- * **Relevant Coursework:** Applied Bayesian Data Analysis, Monte Carlo Simulation, Industrial Data Science, Deep Learning, Data Science for Dynamic Systems

Vellore Institute of Technology

Bachelor of Technology in Computer Science, CGPA: 8,00/10

Vellore, India

September 2020- May 2024

- * **Achievement:** Special Achiever award for Winning 1st Position in an International Event organised by **NASA**
- * **Leadership:** President, SAE Team Infinix (Official NASA HERC Team)
- * **Relevant Coursework:** Database Management, Programming for Data Science, Information Security Analysis, Natural Language Processing, Blockchain and Cryptocurrency, Social and Information Networks, Artificial Intelligence

PROJECTS

Neighborhood Heterogeneity in Housing Prices | Bayesian Multilevel Modeling

- * Analyzed **21,613 housing transactions** across **70 zip codes** using a Bayesian hierarchical framework to study neighborhood-level price heterogeneity.
- * Implemented multilevel Gaussian models in **R (brms)**, progressing from fully pooled to varying-intercept and varying-slope specifications with log-transformed housing prices and weakly informative priors.
- * Evaluated models using posterior predictive checks, residual and MCMC diagnostics, and LOO-CV (ELPD); 95% credible intervals on conditional effects showed that **varying-slope models** best capture local market heterogeneity.

Learning Unknown Dynamical Systems via SINDy | *Sparse Identification of Nonlinear Dynamics*

- * Identified the governing equations of an unknown 2D nonlinear dynamical system from **200 noisy trajectories** (201 time steps each) using Sparse Identification of Nonlinear Dynamics (SINDy).
- * Implemented the full SINDy pipeline, including numerical derivative estimation, nonlinear library construction, and **sparse regression (LASSO)**.
- * Recovered an interpretable ODE capturing **inward-spiraling dynamics** toward a stable equilibrium, validated via forward simulation on unseen initial conditions (**MSE** 2.9×10^{-4} over a 100-step horizon), demonstrating robustness under Gaussian noise.

Cart-Pole Swing-Up Control via Data-Driven and Optimal Methods | *Dynamic System Controller*

- * Unified the implementation and direct comparison of three advanced control strategies-Nonlinear **Model Predictive Control (MPC)**, **Soft Actor-Critic (SAC) reinforcement learning**, and **MPC with neural network (NN)** surrogate dynamics-for the classic cart-pole swing-up task.
- * Collected transition data by simulating ground-truth dynamics, trained a PyTorch MLP to model state transitions, and seamlessly embedded the learned model within the MPC prediction/optimization loop for model-based RL.
- * Quantitatively evaluated all methods on relevant closed-loop metrics: upright-time ratio (within angle threshold), mean control effort, and maximum cart displacement, reporting comparative results in reproducible experiments.

Studierendenwerk Dortmund Freie Zimmer | *Student Accommodation Availability Scraper*

- * Developed a **web scraper** to automatically collect and monitor available student accommodation listings from Studierendenwerk Dortmund's official website.
- * Extracted detailed room data (e.g., location, price, and amenities) by parsing website content, enabling aggregation and streamlined presentation of vacant room offers.
- * IFacilitated up-to-date visibility for students searching for accommodation, supporting integration with notification systems to alert interested users when new rooms become available. **I got accommodation using this :)**

RealGames Simulation Parameter Analysis | *Agent-Based Market Simulation & Predictive Modeling*

- * Designed and validated a comprehensive **parameter sensitivity framework** for an agent-based beverage market simulation, evaluating how behavioral, marketing, pricing, and physiological parameters influence market share, revenue, and adoption outcomes across 67 experimental simulation runs.
- * Implemented a full simulation analytics pipeline integrating **Bayesian behavior models**, factorial experimental design, API-driven simulation execution, exploratory data analysis, correlation analysis, temporal trend analysis, and predictive modeling using Random Forest and XGBoost.
- * Built interpretable ML models to predict brand-level performance metrics (market share, units sold, revenue), and analyzed feature importance using **SHAP and ALE** plots to identify the impact of parameters such as price sensitivity, marketing effectiveness, awareness decay, and automation rate on consumer behavior and brand dominance.

SKILLS

- **Spoken Languages:** English (fluent), Hindi (native), German (A1 – ongoing).
- **Programming Languages:** Python, JAVA, R, SQL, C++
- **Statistical Modeling & Methods:** Bayesian Hierarchical Modeling, Generalized Linear Models (GLM), Regression Analysis, Hypothesis Testing (t-test, ANOVA, χ^2), Time Series Analysis, Stochastic Processes (Markov Chains, Poisson Processes).
- **Machine Learning & NLP:** Supervised Learning (Random Forest, SVM), Dimensionality Reduction (PCA), Clustering (K-means), Natural Language Processing (TF-IDF, Topic Modeling, Sentiment Analysis).
- **Data Analysis Libraries:** pandas, NumPy, SciPy, statsmodels, scikit-learn, tidyverse (dplyr, ggplot2), brms, rstan.
- **Data Visualization & Reporting:** Power BI, Tableau, Matplotlib, Seaborn, Plotly; exploratory and model-based visualization.
- **Tools & Workflow:** Git/GitHub, LaTeX, R Markdown, Excel (data analysis), VS Code.