

# Monojit Mandal

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## Summary

Data Scientist with 5+ years of experience in building data-driven solutions using machine learning, statistical and mathematical modeling, and data visualization. Proven expertise in Python, SQL, and Cloud platforms. Strong background in delivering actionable business insights and developing scalable models for production environments.

## Skills and Expertise

**Languages:** Python, R, SQL

**Libraries/Frameworks:** pandas, NumPy, scikit-learn, TensorFlow, PyTorch, Polars, Matplotlib, Seaborn

**Tools/Platforms:** Jupyter, Git, Docker, MLflow, Airflow, Streamlit, FastAPI

**Databases/Cloud:** MSSQL, Oracle, BigQuery, GCP (Vertex AI)

**Domain/Function:** Manufacturing Analytics, Supply Chain Analytics, Reliability Modeling, Operations Research, Machine Learning, NLP

## Professional Experience

### • Decision Scientist, Supply Chain *Accenture*

June 2024 – Present  
Kolkata, India

- o” Developed an Inventory to Order matching algorithm for a Steel Manufacturer to optimize yield, Inventory and Service Level using a Multi Objective Greedy Heuristic based optimization model. Considering dimension, quality and chemistry as matching criteria, model was able to pick the best order for inventories leading to ~2.5% better yield and selected older materials (~7 days) to older coils (~14 days) to reduce risk of material degradation and risk of not meeting target date for orders when compared against existing manual process.
- o” Developed a Vendor Negotiation chatbot for big Retailers/FMCG/CPG to help automate negotiations with tail spend suppliers (low volume/transaction) to help automate negotiations. Agentic Architecture with LLM was used to understand priority levers in the negotiation process and based on set parameters it finds competitive offers for suppliers.
- o” Developed a POC MILP model for an energy retailer/distributor company to optimize Vessel Routing and Scheduling process more efficiently to reduce Fixed Cost, Port operating cost, Demurrage Cost while considering multiple factors like Inventory levels, Vessel utilization, port demand, berth availability etc

### • Data Scientist, Supply Chain *General Mills*

Mar 2021 – June 2024  
Mumbai, India

- o” Developed a MILP model to recommend daily optimal production plan of Snacks for a year horizon in such a way that total Changeover time is minimum, and inventory level is balanced (balancing stockout and overflow). This tool can potentially save ~ \$2 MM/Year for a Manufacturing Line by reducing average inventory by ~25 % and reducing changeover time by ~15 %
- o” Reduction of Manufacturing waste in Refrigerated Frozen Baked Goods product by recommending optimal controlling parameter ranges during the manufacturing process, leading to savings of ~ \$8 M/Year. Generalized Linear Model (Poisson’s Regression) used to establish the relationship between Reject and controlling parameters with R square of ~50 %.
- o” Developed Ramp Up Analysis tool (self-serve) to improve System Reliability of Manufacturing Systems by ~1.5% leading to potential savings of ~ \$9 MM/Year. Using the mean shift Changepoint algorithm Ramp Up and post Ramp Up phase were identified. A self-serve Dash App was developed to share actionable insights to System Engineers and root cause analysis.
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- o" Minimizing waste of Hard Taco Shell product using CART Model resulting in potential ~ \$ 1 MM savings in a Year. Decision Tree, Random Forrest, XGBoost, Gradient Boost models are applied and compared with respect to R2 metric and finally Decision Tree model was selected because of explainability. With R2 value of 0.6 the model was able to recommend an optimal operating range of mixing and processing parameters.
- o" Developed a tool to minimize overuse/overpack waste and providing visibility to Operators helped to save yearly ~ \$ 100,000 in a Manufacturing Line. MILP Optimization algorithm is used to optimize time to stop processing system to balance surge while completing target production on time.
- o" Developed an automated ML based approach to help Capacity Planners to understand whether Supply Chain planning (horizon 24 months) needs to be revised or not, which can lead to savings of 300 employee hours per month.
- o" Developed a Bid Variance Dashboard using Tableau to help Transportation leaders to identify root causes of difference in actual and bid numbers. Also, this provides a direction to the future scenario of bid considering extension of current bid split.

- **Analytics Consultant**

*EXL Analytics*

Nov 2020 – Mar 2021

Gurugram, India

- o" Developed a Power BI dashboard and self-serve data model for an eyeglass retailer Company to improve marketing campaign of product and acquiring new customer, tracking sales, profit, margin etc. in real time manner.

- **Data Analyst Intern**

*Tata Steel*

July 2019 – Dec 2019

Kalinganagar, India

- o" Reducing 80 to 85% of waste in byproduct gases produced during steel making process with the help of MILP Optimization model. Time dependent parameters are estimated using complex ensembled based model (HP-LSTM-LSSVM).

## Academic Projects

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- **End-to-End ML Pipeline for Fraud Detection**

*Python, scikit-learn, FastAPI, Docker*

[GitHub Link](#)

- Designed an end-to-end fraud detection pipeline processing 1M+ records, achieving 94% ROC-AUC. Containerized API served predictions at scale.

- **Time Series Forecasting for Demand Prediction**

*Python, Prophet, pandas, Polars*

[GitHub Link](#)

- Built time series models to predict product demand, reducing stockouts by 12% in simulation environment.

## Education

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- **M.Tech in Industrial Engineering, IIT Kharagpur**

*Grade: 9.76 out of 10*

June 2018 – June 2020

Kharagpur, India

- o" Relevant Coursework: Statistical Decision Modeling, Operations Research, Supply Chain Management, Production Planning and Inventory Control, Applied Multivariate Statistical Modelling, Stochastic Modelling

- **B.Tech in Mechanical Engineering, GCETTB**

*Grade: 8.71 out of 10*

June 2014 – June 2018

Berhampore, India

- **Higher Secondary in Science, BNGHS**  
*Grade: 76.4%*

June 2012 – June 2014  
Kolkata, India

- **Secondary, LHV**  
*Grade: 83.4%*

June 2012 – June 2014  
Kolkata, India

## Certifications

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- AWS Certified Machine Learning – Specialty
- Google Professional Data Engineer
- Coursera Deep Learning Specialization

## Achievements & Awards

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- Top 5% in Kaggle Titanic Competition (2024)
- Winner, ABC Hackathon 2023 (Theme: AI for Retail)