Saket Kumar

Master of Business Analytics | | Indian Institute of Science, Bangalore

8744-027-158 saketkumar@iisc.ac.in||bond.saketkumar@gmail.com saket06 Saketkr06

Education

YEAR	DEGREE	INSTITUTE	RESULT
2024*	**M. Mgt**	**Indian Institute of Science, Bangalore**	**8.3/10***
2022	B. Tech	University of Agricultural Sciences| Bangalore	**8.47/10**
2017	12TH (C.B.S.E)	Indian Public School | Purnia Bihar	**84.6%**
2015	10th (C.B.S.E)	Millia Convent English School | Purnia Bihar	**10/10**

Internship

Bosch Private Limited — *June '23-July '23*

❖ **Division : Mobility Solutions-AI for Industrial Applications.**

Project 1: EV Range Prediction System

- **Developed a range prediction system for electric vehicles (EVs). We proficiently handled real-world EV data from the BMW i3(60 ah), encompassing environmental, vehicle, battery, and heating circuit data.**
- **Data Analysis and Preprocessing:** Conducted **Exploratory Data Analysis (EDA)** to identify correlations and significant features affecting EV range. Employed data preprocessing techniques, including **feature selection** and normalization, to optimize model performance**.**
- **Model Selection and Evaluation:** Utilized M**ultiple Linear Regression, Random Forest**, and **Deep Neural Network** algorithms for EV range prediction and employed **Recursive Feature Elimination (RFE)** to identify crucial features for improved model accuracy**.**
- **Results and Model Performance:** Using the Random Forest algorithm, attaining an R-squared of up to **0.96**. Produced models with **Mean Absolute Error (MAE)**, of **0.006** indicating precise range predictions.
- **Practical Deployment and Application**: Created a **Digital twin model** to simulate real-world EV range prediction scenarios and deployed the model on **AWS EC2** instance.

Project 2: Compatibility-Based Vehicular Ad-Hoc Reliable Routing

- **Incorporated AI and ML techniques into vehicular networks to enhance proactive communication and predictive decision-making, contributing to developing the Internet of Vehicles (IoV).**
- **Objective**: Developed a reliable routing mechanism addressing multi-hop ad hoc communications challenges and dynamic high-mobility environments**.**
- **Approach:** Implemented a proactive approach to **predicting connectivity duration** between vehicles and emphasised the integration of connectivity duration as a crucial parameter for route selection**.**
- **Evaluation:** Assessed **five machine-learning classification** techniques using the Open Street Map dataset to evaluate the effectiveness of the proposed scheme**.**
- **Comparison:** Conducted a comparative analysis of machine learning techniques based on established metrics such as **accuracy, computational time, misclassification rate**, and **F1 score.**

Achievements

- Secured **All India Rank 6** (AIR) in **Gate 2022**. — *Mar '2022*
- Awarded **National Talent Scholarship** for the tenure of my **bachelor's degree**. — *Aug '2018-Jul '2022*
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Projects

State Farm Distracted driver detection:

- Using **Convolutional Neural Networks (CNN)** to address road safety challenges, particularly in India where driver distraction contributes to **78%** of accidents.
- Successfully developed and fine-tuned CNN models, including an optimized **VGG-16** architecture, achieving validation accuracy exceeding **99.5%** for multiple driver distraction classes.
- Demonstrated strong expertise in **data preprocessing, image augmentation**, and **ensemble modelling** techniques to improve model robustness and real-time prediction speed.

Clock Selling price prediction:

- Analysed a dataset of antique grandfather clocks, examining the **relationships** between selling prices, clock age, and the number of bidders.

- Developed and evaluated a **first-order multiple regression model** to predict selling prices based on age and bidder count, demonstrating the **model's usefulness**.
- Explored **partial** and **marginal correlation coefficients**, providing insights into the complex associations between independent variables and the dependent variable.
- Assessed the relative importance of clock age and the number of bidders in influencing clock prices, revealing which factor plays a more significant role in determining auction outcomes.

➢ Airline Passenger Forecasting:

- Applied **ARIMA** modelling techniques to the time series dataset.
- Determined the ARIMA model parameters (p, d, q) through **ACF** and **PACF plot**, resulting in an order of (11,2,1).
- Tried **AR** & **MA** then ARIMA, we see that RSS value has decreased from either case to 1.0292, indicating ARIMA to be better than its individual component models.
- Forecasted for airline passenger for 5 years.

➢ Quora Question Pair Similarity

- Developed an NLP-driven model to assess **question pair similarity on Quora**, enhancing content relevance and user engagement through accurate duplicate detection.
- Extracted various text-based features, including **TF-IDF, and word embeddings**, to represent the textual content of the questions.
- Implemented various **machine learning** and **deep learning models**, such as **Logistic Regression, Random Forest** and **Three Layer Neural Networks**, to predict question pair similarity.
- Utilized evaluation metrics like **Accuracy, Precision, Recall, F1-score**, and **ROC-AUC** to assess model performance and fine-tune hyperparameters.

➢ Customer Behavior Analysis on E-Commerce Data:

- Performed **EDA** using **PowerBI** to summarise the Purchase Data of Amazon customers.
- Used **K-Means Clustering** and **Silhouette score** for segmenting the customers based on similar psychographic and demographic traits.
- It provided relevant **Marketing Solutions** based on the inferences generated from the analysis.

Skills and Course work

- **Languages:** Python, R
- **Framework:** Flask, AWS ,Pytorch , TensorFlow
- **Core Courses:** Applied Probability and Statistics, Corporate Finance, Managerial & Macro Economics, Applied Operations Research, Regression and Time Series Analysis ,Data Mining, Decision Models, Operation Management.
- **Extras:** Machine Learning – Cornell University, Deep Learning – NPTEL (IIT Madras)

Position of Responsibility

- **Class Representative (COAE, UAS):** Acting as the point of contact between professors and students and representing the views.
- **Student Volunteer** for **National Service Scheme.** ***Aug '2018-Jul '2020***