SK RAJU

Final Year Post Graduate
Department of Industrial & Management Engineering

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Academic Qualifications

Year	Degree	Institute	CPI/%
2022	M.Tech.(IME)	Indian Institute of Technology, Kanpur	7.80/10
2020	M.Tech.(Textile Engineering)	GCETT, Berhampore [MAKAUT]	9.21/10
2017	B.Tech.(Textile Technology)	GCETT, Berhampore [MAKAUT]	8.50/10
2013	Higher Secondary (Science)	Baksha B.N. Vidyalaya [WBCHSE]	78.20%
2011	Secondary	Baksha B.N. Vidyalaya [WBBSE]	81.75%

Work Experience

- **Arvind Limited** | Graduate Engineer Trainee (*July'2017 - September'2018*)
  - Shift-in-charge of textile chemical processing production department
  - Modified most of the processes parameters resulted in a 20% increase in efficiency

Internships

- **Bajaj Finance Limited** | Project Intern- Data Analytics (*March'2022 - April'2022*)
  - Built a dynamic banner generation system.
- **Harvesting India Private Limited** | Data Science Intern (*May'2021 - July'2021*)
  - Built a crop recommendation system for customers based on their purchase history
  - Implemented User-based and Item-based filtering techniques with similarity measures like **Cosine** and **Pearson**
  - Evaluated with **RMSE, Precision** and **Recall** score; **Collaborative filtering** with **dummy** data performed the best
- **Urvija AI** | Product Development Intern (*May'2021 - July'2021*)
  - The designed product can show if a shortage occurs in any pharmacy, which can be replenished by moving some drugs from a nearby pharmacy that has an excess or about to expire of that medicine.
  - This product will result in less medicine expiring and faster delivery to customers
  - Made Business Requirement Document and Product Requirement Document for the product

Thesis Work

- **Consumer Behaviour** *(IME M.Tech Thesis)* (*August'21 - June'22*)
  Instructor: Dr Devlina Chatterjee, Department of Industrial and Management Engineering, IIT Kanpur
  - The goal of the study is to see the impact of COVID shock on taking up health insurance
- **Analysis and Simulation of Fluid Flow inside Airjet Weaving Main Nozzle** *(TT M.Tech Thesis)* (*July'19 - June'20*)
  Instructor: Dr Anindya Ghosh, Department of Textile Technology, GCETT Berhampore
  - Using Ansys Fluent,created a 3D simulation of the fluid flow behaviour inside the weaving nozzle
  - Analysed the velocity and pressure distribution to demonstrate the principle of airjet weaving
- **Prediction and Classification by Rough Set Approach** *(TT B.Tech Thesis)* (*July'16 - June'17*)
  Instructor: Dr Anindya Ghosh, Department of Textile Technology, GCETT Berhampore
  - Predicted yarn strength based on fibre characteristics
  - Classified fabric defects and yarn defects using the **Batch Classifier** from the extracted features via image processing
  - Reduced data using Johnson's Algorithm on Rosetta (Rough Set toolkit)

Key Projects

- **Red Wine Quality Prediction** *(Ongoing Course Project) [Statistical modelling for BA]* (*August'21 - September'21*)
  Instructor: Dr Devlina Chatterjee, Department of Industrial & Management Engineering, IIT Kanpur
  - Performed **Multivariate Regression Analysis** to predict red wine quality using 1599 data observations
  - Verified **Ordinary Least Squares** assumptions and multicollinearity by utilising various statistical measures
  - Identified heteroskedasticity using Breusch-Pagan test and handled it using robust standard errors in regression
  - The adjusted R2 with and without robust error was 0.3567 and 0.381, respectively
  - Statistically inferred significant variables were alcohol, volatile acidity, density, chlorides and pH
- **Fetal Health Classification** *(Course Project) [Applied Machine Learning]* (*February'21 - March'21*)
  Instructor: Dr Veena Bansal, Department of Industrial & Management Engineering, IIT Kanpur
  - Classified fetal health among three categories Normal, Suspect and Pathological analysing Cardiotocograms data
  - Performed EDA, preprocessing and used **Logistic Regression** with **L2 Regularization** for feature selection
  - Modeled and inferred using **Decision Tree Classifier** and assessed using **Avg. Precision (0.83), Avg. Recall (0.86), Avg. F1-score (0.84), MCC score(0.76)**
- **Analysis of Stand-up Comedian by NLP** *(Course Project) [Applied Machine Learning]* (*March'21 - April'21*)
  Instructor: Dr Veena Bansal, Department of Industrial & Management Engineering, IIT Kanpur
  - Processed the transcripts of the most famous comedian using **NLP** to note their similarities and differences
  - Executed preprocessing including tokenizing, stemming, removal of stop words and common words, etc.
  - Prepared **Word Cloud**, **Topic Modelling** using **Gensim**, analysed **Routine Sentiment** and **Varying Sentiment** using **TextBlob**, also checked Vocabulary, Profanity, Words per Minute, etc.

- **Prediction of Flight Ticket Price** *(Course Project) [Data Mining and Knowledge Discovery]* (*October'20 - December'20*)
  Instructor: Dr Faiz Hamid, Department of Industrial & Management Engineering, IIT Kanpur
  - Predicted flight ticket price using **Linear Regression** based on some features like cabinClass, rate, priceClass, etc.
  - Performed EDA, pre-processed the data and used **Lasso Regularization** for important feature selection
  - Used **R-squared (0.97), Adj. R-squared (0.97), RMSE, RMAE** as primary evaluation criteria
  - Also checked multicollinearity and other statistical measures to meet the model's assumptions and better performance
- **Credit Card Fraud Detection Using HMM** *(Course Project) [Stochastic Process]* (*March'21 - May'21*)
  Instructor: Dr Avijit Khanra, Department of Industrial & Management Engineering, IIT Kanpur
  - Defined observable symbols using **KMeans** clustering on customer's earlier transactions and identified the spending profile
  - Built **Hidden Markov Model** from simulated data of a credit card user using depmixS4, hmm libraries
  - Estimated transition and emission probabilities using **Baum-Welch Algorithm** (Forward-backward algorithm)
  - Sequentially predicted whether the upcoming transaction is fraudulent with recall 0.81 and F1 score 0.67
- **Markowitz Portfolio & Determine Over/Under priced Stocks***(Course Project)[Financial Engg.]* (*March'21-April'21*)
  Instructor: Dr Suman Saurabh, Dr Shankar Prawesh, Department of Industrial & Management Engineering, IIT Kanpur
  - Considered NSE top 100 companies' five years' daily stock closing price data
  - Examined time series characteristics, estimated returns, fitted distribution using test statistics
  - Built **Markowitz portfolio** by taking top 15 companies with high sharpe ratio, and plotted the efficient frontier
  - The model provided an outcome of 20% profit in just two month and was pretty consistent
  - Plotted **Security Market Line** for all 100 stocks and classified the overpriced and under-priced stocks.
- **Mall Customer Segmentation** *(Self Project) [Clustering]* (*August'21*)
  - Divided the customers into six clusters for marketing and strategic planning purposes based on their demographic information and spending score (based on behavior and purchase history)
  - Performed data visualization and plotted elbow graph to identify the optimal parameter for **KMeans** clustering algorithm.
  - Observed **Silhouette score (>0.6)** and corresponding plots to evaluate the clusters
  - Built final clusters using **K-Prototype** to address the categorical features also
- **Prediction of Customer Attrition of a Cellphone Company** *(Self Project) [Classification]* (*July'21*)
  - Predicted whether the customer is likely to leave depending upon their activity and purchase behaviour with **Precision (0.75), Recall (0.79), F1-score (0.77), MCC score(0.7275)**
  - Handled data class imbalance of ratio 83:17 using **SMOTETomek**
  - Performed EDA, preprocessing and used **Random Forest Classifier** for modelling as well as feature selection
- **Forecasting Monthly Champagne Sales** *(Self Project) [Time Series Analysis]* (*July'21*)
  - Predicted 2 years of monthly sales from past 9 years of sales data using time series techniques
  - Decomposed the time series into its components by analyzing trend, seasonality, noise, etc.
  - Checked stationarity using ADF-test (Augmented Dickey-Fuller) and stationarised time series by Differencing(d)
  - Plotted PACF (Partial Autocorrelation function) and ACF (Autocorrelation function) to find optimal parameters p, d, q
  - Applied AR, ARIMA, SARIMA models and used RMSE and MAPE as evaluation metric

Relevant Courses

Data Mining and Knowledge Discovery	Probability and Statistics	Financial Engineering
Applied Machine Learning	Stochastic Processes and Applications	Introduction to Computing
Statistical Modelling for Business Analytics	Operations Research	Research Methodology

Positions of Responsibility

- **Departmental Post Graduate Committee Student Nominee** , M.Tech IME IIT Kanpur (*August'21 - July'22*)
  - In charge of responding to students' academic concerns and, if required, mediating with the convener.
  - Maintain frequent communication with the DPGC convener and assist him/her with any academic-related needs.
  - Assist the PG secretary with departmental decisions
- **Class Representative**, M.Tech IME IIT Kanpur (*September'20 - July'22*)
  - Represent the batch in both official and informal contexts
  - Keep track of the activities of each team and its members
  - Organize and coordinate team meetings and assist other teams when needed
- **Class Representative**, B.Tech TT GCETT Berhampore (*August'13 - June'17*)
  - Represented the batch and offered assistance to the Training and Placement Officer whenever necessary

Technical Skills

- **Programming Languages and Tools:** Python, R, SQL, MS Excel, Rosetta, Ansys Spaceclaim, Ansys Fluent
- **Libraries and Packages:** Pandas, Numpy, Matplotlib, Seaborn, SciKit Learn, Statsmodels, NLTK, etc.

Soft Skills

- Leadership, Team Management, Problem Solving, Communication

Achievements & Extra-Curricular Activities

- Awarded **HackerRank 5 star Gold Badge** in **SQL**
- Secured an **All India Rank of 11** in **TF GATE 2020** with 99.30 percentile
- Achieved **Student of the Year** award in **2017** from Department of Textile Technology, GCETT Berhampore
- Badminton, Table Tennis