Amartya Kumar Maulik

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Education

PhD in Statistics, *Colorado State University* August 2022 - Current
GPA: 4/4
M.S. in Statistics, *Indian Institute of Technology, Kanpur (IITK)* August 2019 - May 2021
CGPA: 9.2/10
B.S. in Statistics, *University of Calcutta* August 2016 - May 2019
CGPA: 8.58/10 | Minor in Mathematics and Computer Science

Skills

Tools and Languages	R, Python
Modeling	Supervised and Unsupervised Learning (Clustering and Dimension Reduction), Regression, Data Analysis, Bayesian Computation, MCMC
Soft Skills	Communication, Problem Solving, Creativity

Experience

Graduate Teaching Assistant **August 2022 - Present**
Colorado State University *Fort Collins, CO*

- Instructor for courses - Computing and Math Skills for Statistical Analysis and Intro to Applied Statistics
- Grader for courses - Regression Models and Applications, Mixed Models and Statistical Data Analysis

Data Analyst Intern, Intelligent Customer Interactions Team **May 2020 - July 2020**
Ford Motor(GDIA) *Chennai, India*

- **Problem :** Addressing of the classification problem of predicting the likelihood of buying various Ford Nameplates at customer level.
- **Major Tasks performed in Python :**
  - Imputing of missing values and binning of categories of categorical variables with high cardinality to keep the dummy variables in check.
  - Performed Under-Sampling, Over-sampling and SMOTE to address the imbalance in the dataset.
  - Concluded that Random Forest Classifier outperformed Multinomial Logistic, Gradient Boost and Decision Tree using Balanced Accuracy Score (55%).
  - Inferred that the separability of the model was better at segment level compared to nameplate level with an increase of 33% in Balanced Accuracy Score which was further improved by Hyper Parameter Tuning.

Research

Multiple Hypothesis Testing (Ongoing) **Guide: Dr. Tianjian Zhou**

- Developing a Bayesian Hypothesis Testing Framework for Umbrella Trials

Martingales in Discrete Time(2021) **Guide: Dr. Supriyo Ghosh, IITK**

- Explored the concept of martingales in discrete time and developed a strong understanding of the measure-theoretic approach for conditional expectation. Acquired substantial knowledge encompassing martingales, the Martingale Convergence Theorem, martingales bounded in $\mathcal{L}^2$, uniform integrability, and UI martingales.
- Familiarized me with essential concepts, including the Martingale Representation Lemma and the discrete Black-Scholes formula.

Projects

MCMC in Mixture Models **Guide: Dr. Dootika Vats, IITK**

- Modeled a simulated statistical distribution by a mixture (or weighted sum) of other distributions using the infinite Dirichlet mixture model without assuming a finite number of clusters.
- **Methods used :** Collapsed Gibbs, Blocked Gibbs, and Sliced Gibbs for updating the parameters in R.

Feature Selection and Comparison of classifiers **Guide: Dr. Amit Mitra, IITK**

- Used the Mushroom Classification data to see which model and feature selection method better predicted poisonous mushrooms.
- **Methods used:** Logistic Regression, Linear Discriminant Analysis classifier, Random Forest classifier, Chi-Square Feature Selection, and Mutual Information Feature Selection in Python.
- Concluded that the Linear Discriminant Analysis classifier was better than other models based on the computational time (37.1 ms) and accuracy (98.64 %).

A Psychological Survey among College Students

- Used Likert Scale for ordinal scaling and K-sample rank tests for Umbrella alternatives to deal with the alternative hypothesis in the non-parametric setup.
- Failed to reject the null hypothesis of the first-year and third-year students of undergraduate honors courses in Calcutta tending to be more depressed than the second-year students using the method of Combined Hypothesis Testing.

Other Projects

- Principal Component Analysis on Directional Data, Report on different measures of association and Time Series Modelling of the Apple Stock Price.

Activities

Director of Finance, Indian Students Association Fall 2023- Spring 2024
Organizer in Student Organized Activities and Research Seminars (SOARS) Spring 2023- Fall 2023

References

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