TEAM CONTRIBUTION REPORT

Team Name:

FLAM – "Fusion Learning & AI Minds"

(drawn out of first letters of members' first names)

Team Members:

Faiza Abdullah

Lufei Yu

Michael Joseph

Muhammadayan Syed

Professor:

Viswanatha Rao

FLAM Team Contribution Summary:

Reflections on Our Road Casualty Severity Prediction Project

From the outset, our FLAM team embraced a collaborative spirit that defined every aspect of this machine learning project. We formed a WhatsApp group immediately after receiving the assignment, using it as a constant hub for sharing ideas, troubleshooting code snippets, and coordinating tasks. Regular meetings during class breaks allowed us to brainstorm dataset selection, define our prediction goals around road safety, and outline the workflow for preprocessing and modeling. Every decision: from choosing the UK Road Casualty Statistics dataset to strategizing outlier handling and model comparisons, was a group effort, with open discussions ensuring alignment. The proposal, notebook development, and final report emerged from this synergy, where attributing any single activity to one member would undermine the seamless teamwork that made the project a success. While our collective journey built a robust severity prediction model, each of us gained unique insights along the way, as shared below.

Faiza Abdullah led much of the technical integration but learned profoundly from the iterative process. Starting with raw data full of missing values and inconsistencies, she discovered the critical role of preprocessing in model success, mastering techniques like imputation, encoding, and feature engineering to transform noisy data into a clean foundation. Professor feedback on outliers and imbalance challenged her to refine the dataset further, teaching the value of correlation checks and selective filtering to enhance accuracy. Feedback on imbalance prompted her to explore techniques like SMOTE, teaching the value of balanced datasets in avoiding bias. Through trial and error with models, she appreciated how ensembles like XGBoost capture complex patterns in features like age_band, and realized that machine learning is as much about data quality as algorithms, ultimately enabling predictions that highlight vulnerabilities for real-world safety applications.

Lufei Yu gained a solid understanding of machine learning fundamentals through hands-on involvement in data cleaning and model evaluation. She learned how to prepare data by handling missing values, fixing mistakes, and making it suitable for computer learning, recognizing that these steps are essential for accurate predictions. Experimenting with different models taught her to compare results and understand why some perform better, emphasizing the need to remove unusual values and make data easier for models to process. Group meetings, both in class and online, showed her the importance of planning, communication, and problem-solving as a team, turning the project into a valuable lesson in collaboration from start to finish.

Muhammadayan Syed developed a foundational grasp of machine learning by working with the road accidents dataset, learning how to clean data, remove errors, and prepare it for model training. He discovered the significance of addressing missing information, eliminating unusual values, and simplifying data to improve model understanding. Through team meetings at the end of class and online, he learned to communicate ideas effectively, share responsibilities, and solve problems collectively, ensuring timely completion. Overall, the project equipped him with essential skills in data handling, model comparison, and teamwork, illustrating how machine learning initiatives integrate from initial planning to final execution.

Michael Joseph deepened his knowledge of machine learning by contributing to data preprocessing and model analysis, realizing the intricate balance required to turn raw information into predictive insights. He learned the nuances of imputation for missing data, the impact of outlier removal on model stability, and how feature engineering like combining casualty roles enhances interpretability. Collaborative sessions reinforced the power of group dynamics in refining code and interpreting results, ultimately showing him how ML projects demand both technical precision and adaptive teamwork for success.

In summary, our FLAM team's unified effort not only produced a functional severity prediction model but also fostered individual growth in machine learning principles and collaboration.

This project stands as a testament to our collective dedication, possible due to constant guidance by Professor Rao.

In the end, we extend our gratitude towards Professor Viswanatha Rao for patient guidance and support provided throughout. His feedback unveiled unique dimensions, which initially increased our challenges but once attained made us learn incredibly.