# **FLIGHT DELAY PREDICTION USING MACHINE LEARNING**

# **PROPOSED SOLUTION:**

* Using a machine learning model, we can predict flight arrival delays. The input to our algorithm is rows of feature vector like departure date, departure delay, distance between the two airports, scheduled arrival time etc.. the main goal is to compare the performance of machine learning classification algorithms when predicting flight delays.
* We make use of several algorithms, and their predictions were evaluated using a number of measures. The theoretical aspects of selected machine learning models and performance evaluation methods are explained.
* Classification models were selected and trained using seven algorithms: Logistic Regression, K-Nearest Neighbour (KNN), Gaussian Naïve Bayes, Decision Tree, Support Vector Machine (SVM), Random Forest, and Gradient Boosted Tree. The first five of these algorithms are called base classifiers because only one classifier instance is trained for each one. The rest two of the algorithms are called ensemble classifiers because more than one instance of base classifiers are trained, and their collective decision is reported as the final prediction .
* As two of the most popular ensemble algorithms, Random Forest and Gradient Boosted Tree, combine several individual models to improve the performance by more accuracy and less variance.
* After training the MACHINE model we make templates for the user interface asking the user to enter the all details for their flight boarding including arrival point, departure point, date of travel, time of the flight, flight number etc,.
* The UI is created based on the Python Flask App and all the above process is integrated with the Python module. Finally the user needs to enter the flight details and the predicted flight delays are displayed for user. The predicted delays are based on the machine learning models.

NOVELTY REPORT:

* Most previous solution analysed flight delays by comparing the delay prediction of less than five machine learning models. In this solution seven models were evaluated based on their prediction performance to make a better comparison.
* Besides, this we used binary classification rather than numerical classification for better clarification of whether a flight was delayed or not.

FEASIBILITY OF IDEAS:

* The flight delay prediction by Machine Learning model is the feasible one because the predictions are based on the real time previously analysed value .
* The predictions are real one and very accurate for the users who check their flight delays.

SOCIAL IMPACT:

* As people increasingly choose to travel by air, the amount of flights that fail to take off on time also increases. This growth exacerbates the crowded situation at airports and causes financial difficulties within the airline industry. Air transportation delay indicates the lack of efficiency of the aviation system. It is a high cost to both airline companies and their passengers.
* Predicting flight delays can improve airline operations and passenger satisfaction, which will result in a positive impact on the economy.

SCALABILITY OF SOLUTION:

* Predicting Flight Delays can be adopted to larger scale by collecting larger data sets and training the model.
* Particularly we are collecting previous data values from a single airport or place. But it can be scalable to larger scale by collecting larger data sets across all places and flights