**NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)**



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2024-2025

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| **Batch Number** | DB2 |
| **Team Members** | K.Venkata Naveen (21471A05N1)  P.Ashok(22475A0511)  M. Rishikmouli (21471A05N5) |
| **Guide** | Dr.S.Siva Nageswara Rao (Professor). |
| **Title** | Improving Passenger Experience: Predicting Airline  Delays Through Machine Learning |
| **Domain/Technology** | MACHINE LEARNING |
| **Base Paper Link** | https://ieeexplore.ieee.org/document/10194905/ |
| **Dataset Link** | https://www.kaggle.com/datasets/sherrytp/airline-delay-analysis |
| **Software Requirements** | Browser: Any latest browser like Chrome Operating System: Windows 7 Server or later Python (COLAB) |
| **Hardware Requirements** | System Type: Intel Core i5 or above RAM: 8 GB  Number of cores:5 Number of Threads: 4 |
| **Abstract** | Flight delays are one of the major problems faced by airlines, as it affects customers’ experiences and operational efficiency. Several machine learning algorithms were applied to a large-scale dataset that included more than 336,000 records to predict flight delays. Accordingly, four models have been used-Random Forest, Support Vector Machine, Linear Regression, and Decision Tree-on this dataset after handling preprocessing such as missing value handling, imputation of data, and normalization of features. Some of these features include scheduled departure and arrival times, flight distance, and carriers detail. In contrast, among the different models tried, SVM alone was successful enough to yield an accuracy of up to 97%. Therefore, it suited best for SVM to handle the delays’ classification in various features easily and expeditiously. On the other hand, Random Forest and Decision Tree were reasonably correct, yet its result was well below that of SVM. Linear Regression had no success in handling the non-linear relationship present in the sample data. The high accuracy of the SVM model lends credibility to its application in real-time delay prediction systems, which would further assist airlines in informed decision making and operational planning. Future research could aim at an expanded set of features with real-time weather data, as well as investigate ways to optimize the model’s performance by employing more recent advanced algorithms, such as ensemble methods or deep learning techniques. |

Signature of the student(s) Signature of the Guide Signature of the project coordinator