

MEENAKSHI COLLEGE OF ENGINEERING

B.TECH-INFORMATION TECHNOLOGY

DATA SCIENCE

LITERATURE SURVEY

**DEVELOPING A FLIGHT DELAY
PREDICTION MODEL USING MACHINE
LEARNING**

TEAM ID PNT2022TMID27775

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DEVELOPING A FLIGHT DELAY PREDICTION MODEL USING MACHINE LEARNING

INTRODUCTION:

The model's primary goal is to accurately estimate flight delays in order to optimize flight operations and minimize delays. The huge increase in air traffic congestion is to blame for a large portion of the flight delays. They incur direct and indirect costs, such as for maintenance at the gate, extra fees for crew, food service, and lodging. They also affect passenger satisfaction. An airport is a maintenance and transit hub where flight service begins and ends. Inaccurate forecasts of flight delays will result in losses to industries dependent on aviation and passengers, meanwhile, delays will harm the transportation network's service capacity and lead to delays in other airports. The unpunctual arrival of aircraft (both earlier and later than expected) will take significant impacts on an airport's management, such as the reallocation of parking gates ,runways, ferries, and scheduling of ground crew. So, the prediction and the analysis of flight delays are of great significance to airlines, passengers, and airports. Flight delays occasionally cause inconvenience to the modern passengers. Every year approximately 20% of airline flights are canceled or delayed, costing passengers more than 20 billion dollars in money and their time.

Software used:

Jupyter notebook

Operating system : Windows 10.

Coding Language : Python 3.8.

Hardware used:

System : i3 or i5 or i7 6th gen or above

Hard Disk : 500 GB.

Monitor : 15'' LED

Input Devices : Keyboard, Mouse

Ram : 4-8 GB

Applications:

- Vehicle to vehicle communication.
- Air Traffic Control

PAPERS	DESCRIPTION
<p>1.Base paper</p>	<p>1.Aim:Flight delay forecasting and analysis of direct and indirect factors</p> <p>2.Abstract:This paper describes a causal flight delay prediction model that was created for a single airport. To predict flight delays and analyse their fundamental causes, a long short-term memory network with an attention mechanism (LSTM-AM) is constructed.</p> <p>3.existing system: In the Existing system A long short-term memory network of delay prediction is used with an attention mechanism (LSTM-AM) is established to predict flight delays and analyse their primary causes. In this model, the direct and indirect factors related to delays are comprehensively considered. LSTM-AM can focus on input data combined with the attention vector to capture the critical time points, which can make the prediction more accurate.</p> <p>4.proposed system: using the predicted results of this paper to release delayed information in advance can effectively alleviate the nervousness of passengers. The critical time point captured by</p>

	<p>LSTM-AM combined with runway and apron flow control can reduce or eliminate delays of one flight.</p>
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2.Reference paper-

1.Existing system: This paper explores a broader scope of factors which may potentially influence the flight delay, and compares several machine learning-based models in designed generalized flight delay prediction tasks. To build a dataset for the proposed scheme, automatic dependent surveillance-broadcast (ADS-B) messages are received, preprocessed, and integrated with other information such as weather condition, flight schedule, and airport information.

2.proposed system

The evaluation metrics used can be improved better. the proposed random forest-based model can obtain higher prediction accuracy (90.2% for the binary classification) and can overcome the overfitting problem. The Artificial Neural Network provides better accuracy of 83% in predicting the flight delay due to climate factor

1.Existing system: This paper aims at analyzing flight information of US domestic flights operated by American Airlines, covering top 5 busiest airports of US and predicting possible arrival delay of the flight using Data Mining and Machine Learning Approaches..

2.proposed system

The data preprocessing should be done better in this proposed work.

1.Existing system: Experimental results show that the proposed GBDT-based model can obtain higher prediction accuracy (87.72% for the binary classification) when handling limited dataset

2.proposed system

In this paper, we explore a broader scope of factors which may potentially influence the flight delay, quantized those selected factors and created an ADS-B based aviation dataset. To find a suitable way to predict general flight delay, a GBDT based method is proposed. Experimental results show that the proposed GBDT-based method

	<p>can obtain good performance for the binary classification task and there are still existing gap to improve the multi-categories classification task. In summary, the GBDT-based architecture performs better adaptation at a cost of the training accuracy when handling the limited dataset. Our future work will focus on collecting or generating more training data, extracting more factors may potentially influence the flight delay and applying deep learning method to predict flight delay.</p>
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