LITERATURE SURVEY

Developing Fight Delay Prediction Model using Machine Learning

1.Study of Flight Departure Delay and Analysis

ABSTRACT: Analysis of flight delay and causal factors is crucial in maintaining airspace efficiency and safety. However, delay samples are not independent since they always show a certain aggregation pattern. Therefore, this study develops a novel spatial analysis approach to explore the delay and causal factors which is able to take dependence and the possible problem involved including error correlation and variable lag effect of causal factors on delayinto account. The study first explores the delay aggregation pattern by measuring and quantifying the spatial dependence of delay. The spatial error model (SEM) and spatial lag model (SLM) are then established to solve the error correlation and the variable lag effect, respectively. Results show that the SEM and SLM achieve better fit than ordinary least square (OLS) regression, which indicates the effectiveness of considering dependence by employing spatial analysis. Moreover, the outcomes suggest that, aside from the well-known weather and flow control factors, delay-reduction strategies also need to pay more attention toreducing the impact of delay at the previous airport.

REFERENCE:
https://go.gale.com/ps/i.do?p=AONE&u=googlescholar&id=GALE|A610927245&v=2.1&it=r&sid=AONE&asid=8b2120b0

2. A Machine Learning approach for prediction of on time performance of flights.

ABSTRACT: A two-stage predictive model was developed to efficiently predict the departure and arrival delays of flights using flight schedule and weather features. Various supervised machine learning algorithms were implemented. It was found that the departure delay prediction had comparatively higher error rates due to a weak feature set. Furthermore, a Decision Support Tool was developed using the model to predict real-time flight delays. In the future, more data can be extracted by considering a larger

number of airports over a longer time frame to improve the model and other deep architectures can also be implemented.

REFERENCE:
https://ieeexplore.ieee.org/document/8102138

3.Competing Networks, Spatial and Industrial Concentration in the US Airline Industry

ABSTRACT: The paper uses Gini decomposition analysis to evaluate changes in the spatial distribution and industry shares of total US air traffic, as well as analysing the decomposition components for individual airlines and airports for the period 1990–2002. The paper develops explicit relationships between two of the main decomposition schemes used in the income inequality literature and shows the insights that such analysis may provide for evaluation and examination of air transport networks and traffic distributions. A multi-dimensional Gini and itsdecomposition are derived using an adjustment method derived from the relationship between the two Gini decomposition schemes.

REFERENCE:
https://www.researchgate.net/publication/24089448_Competing_Networks_Spatial_and_Industrial_Concentration_in_the_US_Airline_Industry

4.Identification, Characterization, prediction of Traffic flow patterns in multi airport systems.

ABSTRACT: The data-driven framework is based on a sequential application of machine learning methods on historical flight tracks, weather forecasts and airport operational data. A multi-layer clustering analysis is performed to mine spatial and temporal trends in flight trajectory data for traffic flow pattern identification. The results revealed significant variability in throughput and delay performance for different metroplex configurations, emphasizing the importance of anticipating the behavior of the metroplex as a system when forecasting individual airport capacity. Future research goes along this direction by exploring the development of higher-fidelity models for airport capacity prediction that take as input detailed weather information and metroplex configuration forecasts in order to deliver probabilistic capacity forecasts for strategic TMI planning.

REFERENCE:

https://ieeexplore.ieee.org/document/8373742

5.Comparative Analysis on Propagation Effects of Flight Delays

ABSTRACT: This paper aims to capture the interdependency among the sequence of flight delays due to airline operations in airports, weather, and air traffic control conditions. A copula function is used to determine the distribution of delay sequence and examine the propagation effects. Using the actual data sourced from an airline in Asia Pacific region, it is found that flight delays could propagate to downstream airports/airlines, where the strength of delays was decreased, passed on, or increased. Considering the possible effects of increased delays under air traffic control or airline factors, scenarios that adjust flight schedules with additional buffer time were created and analyzed. Results show that, by adding buffer time efficiently, flight schedules can become more reliable.

REFERENCE:

https://www.researchgate.net/publication/322796669_Comparative_Analysis_on_Propagation_Effects_of_Flight_Delays_A_Case_Study_of_China_Airlines

6.Flight Delay Prediction: Data Analysis and Model Development

ABSTRACT: The proposed model gains insight into factors causing flight delays, cancellations and the relationship between departure and arrival delay using exploratory data analysis. In addition, Random Forest (RF) algorithm is used to train and test the big dataset to help the model development. A web application has also been developed to implement the model and the testing results are presented with the limitation discussed.

REFERENCE:

https://ieeexplore.ieee.org/document/9594260

7.Modeling flight delay propagation in airport and airspace network.

ABSTRACT: An Airport-Sector Network Delays model is developed in this paper for flight delay estimation within air transport network. This model takes both airports and airspace capacities into account by iterating among its three main components: a queuing engine, whichtreats each airport in the network as a queuing system and is used to compute delays at individual airport, a Link Transmission Model, which computes delays at individual sector andtransmits all air delays into ground delays, and a delay propagation algorithm that updates flight itineraries and demand rates at each airport on the basis of the local delays computed by the queuing engine and flow control delays

computed by the Link Transmission Model. The model has been implemented to a network consisting of the 21 busiest airports in China and 2962 links that represent to 151 enroute control sectors in mainland China, and its performance is evaluated by comparing with the actual delay data and results of Airport Network Delays model. It is found that the proposed model is well-suited for simulating delays in air transport system where either airports or airspace could be the bottleneck of the system.

REFERENCE:

https://hal-enac.archives-ouvertes.fr/hal-01897108/document

8. Flight Delay Prediction Using Machine Learning Algorithm XGBoost.

ABSTRACT: We are proposing machine learning algorithms like XGBoost regressed, Linear regression Techniques. The aim of this research work is to predict Flight Delay, which is highest economy producing field for many countries and among many transportation this one is fastest and comfort, so to identify and reduce flight delay.

REFERENCE:

https://www.researchgate.net/publication/344227817_Flight_Delay_Prediction_Using_Machine_Learning_Algorithm_XGBoost

9.Propagation Index on Airport Delays

ABSTRACT: This paper explores the propagation effect of flight delays among airports in theaviation system and proposes a new measure, the propagation index, to effectively analyze the interrelationship among airports in relation to flight delays. This index quantifies the effect of delay propagation by measuring the causality among delay time series. To assess the effectiveness of the proposed index on airport delays, three neural network-based regression models are built. The comparative experiments demonstrate that the propagation index proposed is highly correlated with observed airport delays.

REFERENCE:
https://journals.sagepub.com/doi/abs/10.1177/0361198119844240

10: Flight delay prediction for commercial air transport: A deep learning

approach

ABSTRACT: The proposed method has proven to be highly capable of handling the challenges of large datasets and capturing the key factors influencing delays. This ultimately enables connected airports to collectively alleviate delay propagation within their network through collaborative efforts

REFERENCE:

https://www.sciencedirect.com/science/article/abs/pii/S136655451831197