

# IDEA FOR IMPLEMENTATION

➤ **The contributions of this paper can be summarized as follows:**

The direct and indirect factors are taken into account in the delay prediction, which improved the prediction accuracy, The direct and indirect influencing factors choose different networks, which reduces the data redundancy, The attention mechanism is used in the model so that the primary time points of delay can be traced back and located, We use the real data of PEK for one year to verify the effect of the model, and confirm that our model can meet the requirements of practical application.

➤ To solve the above problems, we established a long short-term memory network of delay prediction with an attention mechanism. At present, some airport only stores their detailed indirect factors, so it is difficult to obtain information of all airports in network. At the same time, to ensure a good prediction accuracy, our model needs to be updated according to the latest data. In order to facilitate the acquisition of data and ensure the speed of training, the model proposed in this study was used to predict the flight delay by the historical information of a single airport. The interaction of flights in the aviation network is not within the scope of this paper.

➤ The direct and indirect factors are considered in this deep learning network. The model's attention vector can directly show each time series' contribution to a delay, playing a guiding role in establishing countermeasures. Data related to flight delays contain many features, leading to a massive data dimension. Combining the one-hot encoding method and the statistical characteristics of input data, Pareto principle encoding is proposed to reduce the size of the input variables. We considered features that account for 80% of the attributes and ignore the rest, to reduce the data dimension and improve the speed of model training. We take the time of flight arrival or departure as the data collection point, which is intuitive and easy to use for airport operators.