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Prediction of flight departure delay with big data

Flight departure delay is known as a common problem happening every day in every airline and in every airport. However, the impact of flight delay does not only cause huge economy loss to airlines but also indirectly to its dependent industries, including airports and even the passengers. In the past, flight departure delay estimation is usually studied based on historical data concerning a particular flight or flights in an airport. Numerous statistical tools or analytical methods have been proposed to increase the prediction accuracy. However, as the data concerned is usually focused and mostly limited to the flight data only. Many indirect factors have not been considered, such as the airport congestion, number of incoming or departure flights, etc. As nowadays, with the development of many advanced technologies, flight data becomes more accessible and updated. In this connection, the objective of this paper is to propose an artificial neural network (ANN) for flight departure delay prediction by using big data analysis approach. We collected a one year flight data of the Hong Kong International Airport for analysis. We considered various factors as our input variables, including weather, number of arrival and departure flights, holidays, etc. We compared our proposed ANN method with traditional regression based analysis approaches. The results demonstrate that the proposed ANN method outperforms the traditional approaches. This demonstrates the significant impact of considering those indirect factors on the flight departure delay prediction.

Biography

Felix T S Chan received his BSc Degree in Mechanical Engineering from Brighton Polytechnic, UK, and obtained his MSc and PhD in Manufacturing Engineering from the Imperial College of Science and Technology, University of London, UK. He is the Associate Dean (Research) in the Faculty of Engineering, The Hong Kong Polytechnic University. His current research interests are Logistics and Supply Chain Management, Operations Management, Production Management, Distribution Coordination, Systems Modelling and Simulation, Supplier Selection, AI Optimization, Aviation Management. To date, he has published over 16 book chapters, over 340 refereed international journal papers and 280 peer reviewed international conference papers.

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