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A Novel Deep Learning Method for Aircraft Landing Speed Prediction Based on Cloud-based Sensor Data

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Abstract

The combination of artificial intelligence methods and IoT based sensor data will play a critical and crucial role in various environments. Flight landing safety is a research hotspot of aviation field for a long time. Accurately predicting the landing speed is conducive to reducing the landing accidents. In this paper, we proposed an accurate aircraft landing speed prediction model based on the long-short term memory (LSTM) with flight sensor data. Firstly, we analyze and pre-process the dataset with statistical method including randomness tests and stationary tests. Secondly, we design the features by random forest algorithm and reduce the dimensionality of features with principal component analysis. Thirdly, we develop a deep architecture based on long-short term memory to predict the aircraft landing speed. Experiment results prove that it has better performance with higher prediction accuracy compared with the state of the art, indicating that the proposed model is accurate and effective. The findings are expected to be applied into flight operation practice for further preventing of landing accidents and improving the air management for air traffic controllers.

Keywords: `IoT, Deep learning, Landing speed prediction, QAR data`

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