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An Innovative Deep Architecture for Aircraft Hard Landing Prediction Based on Time-Series Sensor Data

Chao Tong^a, Xiang Yin^a, Jun Li^a, Tongyu Zhu^a, Renli Lv^b, Liang Sun^b,
Joel J. P. C. Rodrigues^{c,d,f,e,*}

^a*School of Computer Science and Engineering, Beihang University, Beijing, China, 100191.*

^b*Department of General Aviation, Civil Aviation Management Institute of China, 100102*

^c*National Institute of Telecommunications (Inatel), 37540-000 Santa Rita do Sapucaí - MG, Brazil.*

^d*Instituto de Telecomunicações, Portugal.*

^e*University ITMO, 191002 St. Petersburg, Russia.*

^f*University of Fortaleza (UNIFOR), 60811-905 Fortaleza - CE, Brazil.*

Abstract

This paper proposes an innovative deep architecture for aircraft hard landing prediction based on Quick Access Record (QAR) data. In the field of industrial IoT, the IoT devices collect IoT data and send these data to the open IoT cloud platform to process and analyze. The prediction of aircraft hard landing is one kind of typical IoT application in aviation field. Firstly, 15 most relevant landing sensor data have been chosen from 260 parameters according to the theory of both aeronautics and feature engineering. Secondly, a deep prediction model based on Long Short-Term Memory (LSTM) have been developed to predict hard landing incidents using the above-mentioned selected sensor data. And then, we adjust the model structure and conduct contrastive experiments. Finally, we use Mean Square Error (MSE) as the evaluation criteria to select the most optimal model. Experimental results prove its better performance with higher prediction accuracy on QAR datasets compared with the state-of-the-art, indicating that this model is effective and accurate for hard landing prediction, which helps to guarantee passengers' safety and reduce the incidence of landing accidents. Besides, the proposed work is conducive to making an innovation for

*Corresponding author

Email address: joeljrc@ieee.org (
Joel J. P. C. Rodrigues)

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