Dataset of FDI method Based on Airframe Vibration Signals

for Quadrotor

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Introduction

This is a data set including three airframe vibration datasets, a data preprocessing program and a Fault Detection and Identification (FDI) program. The airframe vibration datasets are collected from a micro-quadrotor UAV produced by DJI corporation (see Fig.1) and the data acquisition equipment is a data acquisition software SensorMonitor (see Fig.2) installed in iPhone. The data acquisition process is as follow: i) fix the iPhone to the bottom of the UAV (see Fig.3); ii) make the UAV hover with faultless blades, meanwhile, the accelerometer embedded in iPhone collects the Dataset I; iii) make the UAV hover with one fractured blade, then collect the Dataset II; iv) make the UAV hover with one distorted blade, then collect the Dataset III. The dataset can be used to detect and identify the blade faults (see Fig.4) of micro-quadrotor UAV. For more details, please refer to our paper: Yan Jiang, Zhao Zhiyao, Liu Haoxiang, Quan Quan. "Fault Detection and Identification for Quadrotor Based on Airframe Vibration Signals: A Data-driven Method".

Usage

1. Download the data set that includes three airframe vibration datasets, a data preprocessing program and a Fault Detection and Identification (FDI) program.

2. Run "Data_Preprocessing.m". The three airframe vibration datasets are preprocessed and the feature vectors are extracted.

3. Run "Fault_Detection_and_Identification.m". The result of blade FDI can be obtained.

If you have any questions, then please feel free to contract Yan Jiang (sy1403533@buaa.edu.cn) or Quan Quan (qq_buaa@buaa.edu.cn). If you use these data in your paper, please cite it as: Yan Jiang, Zhao Zhiyao, Liu Haoxiang, Quan Quan, "Dataset of FDI method Based on Airframe Vibration Signals for Quadrotor", http://rfly.buaa.edu.cn/, Beihang University, Beijing.

Reference

[1] J. Yan, Z. Zhao, H. Liu, Q. Quan, Fault Detection and Identification for Quadrotor Using Airframe Vibration Signals: A Data-driven Method.

Fig.1 The micro-quadrotor UAV produced by DJI corporation

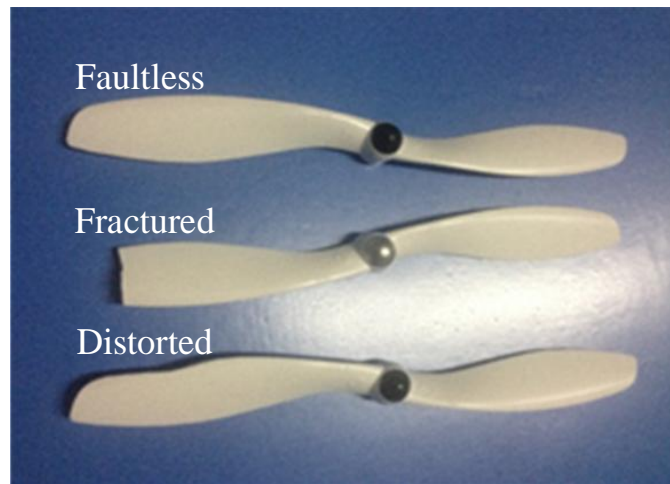Fig.2 The data acquisition software SensorMonitor

Fig.3 iPhone is fixed to the bottom of UAV

Fig.4 The three blade states tested in experiment