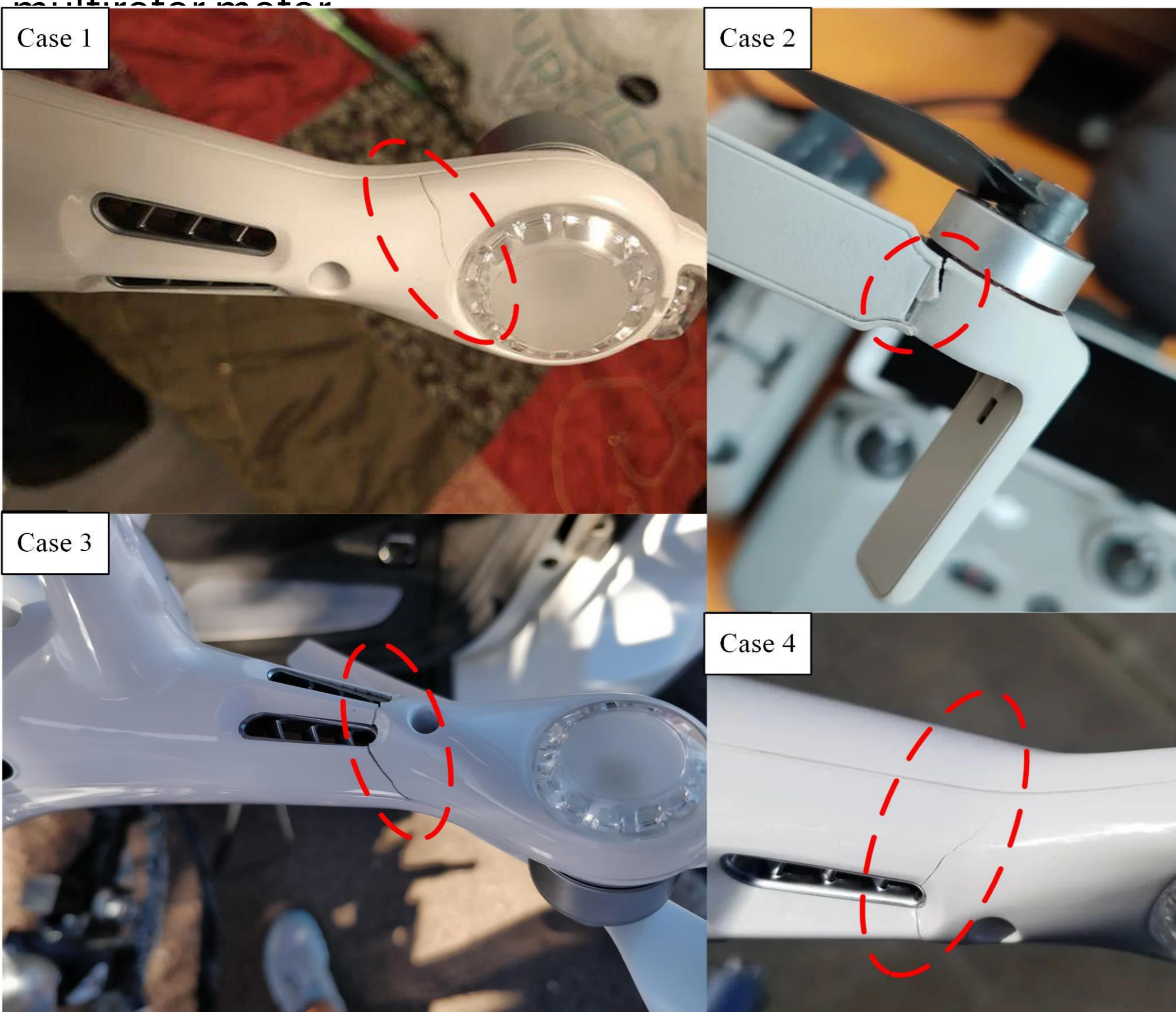




AUTOMATED VIBRATION DETECTOR FOR MULTIROTOR

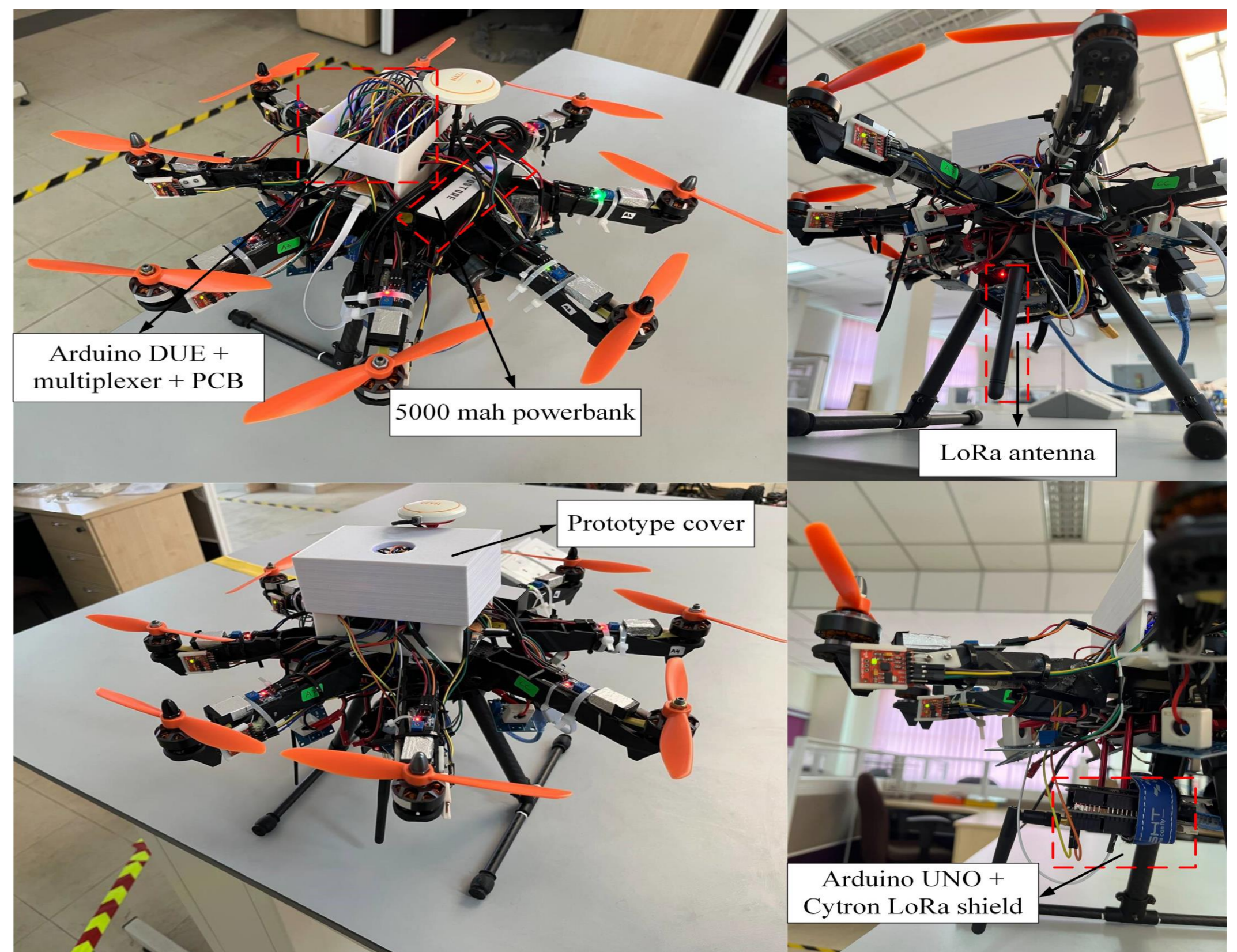
Problem Statement

If a UAV, particularly a multirotor, collides or crashes, there might be some damage to the propellers or multirotor arms. The existence of such damages will produce unwanted vibrations that can significantly deteriorate the performance of the multirotor and eventually lead to a crash. These damages can be in the form of cracks, which are sometimes not easily seen, especially on the multirotor arms. Cracks in multirotor arms typically occur at the region close to the multirotor motor.



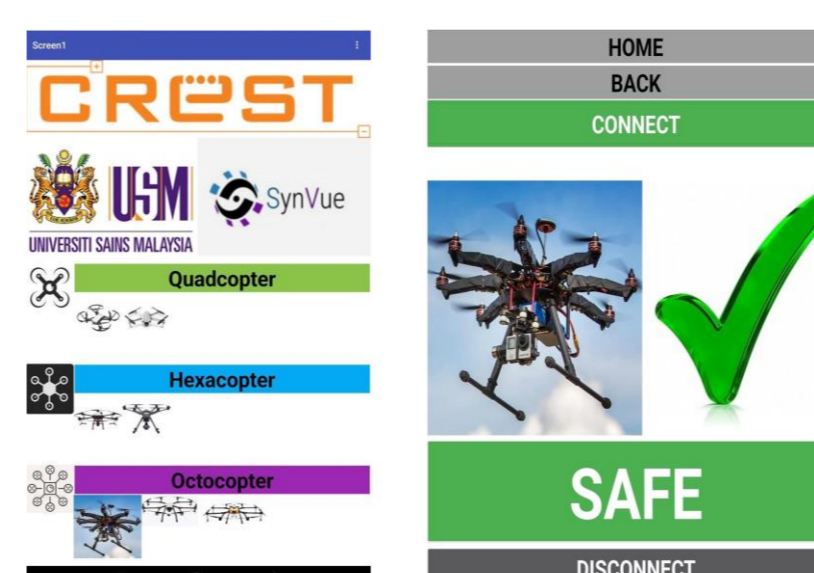
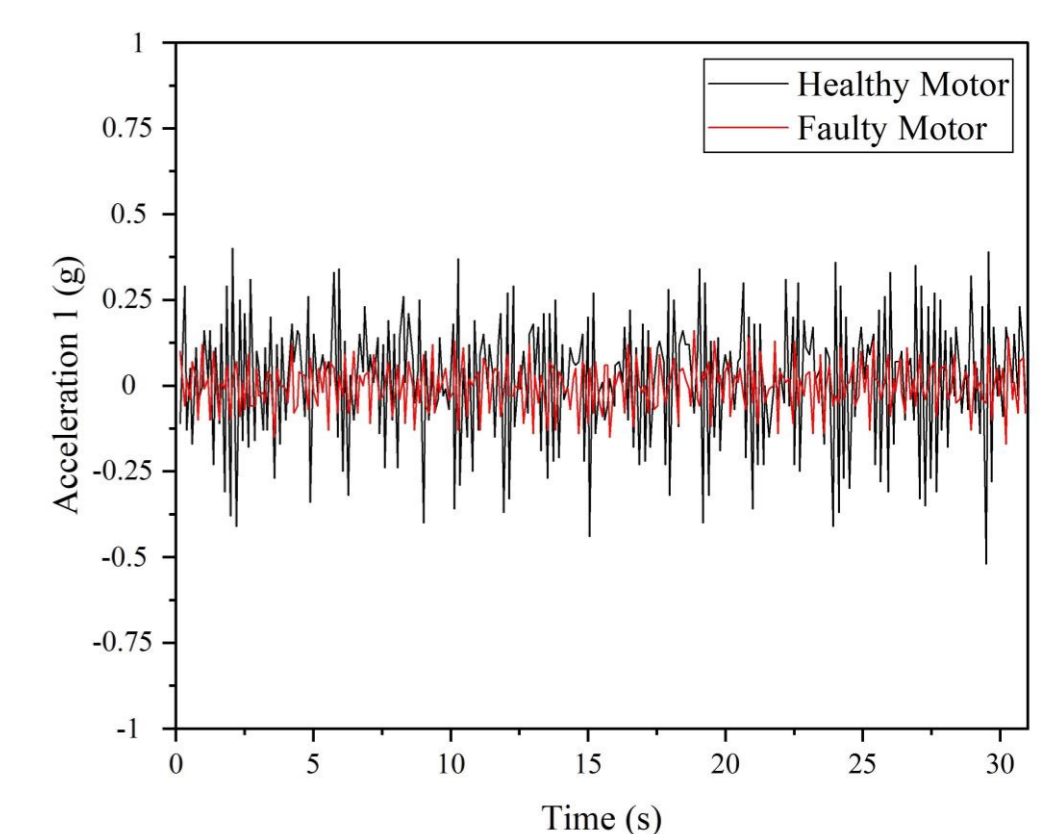
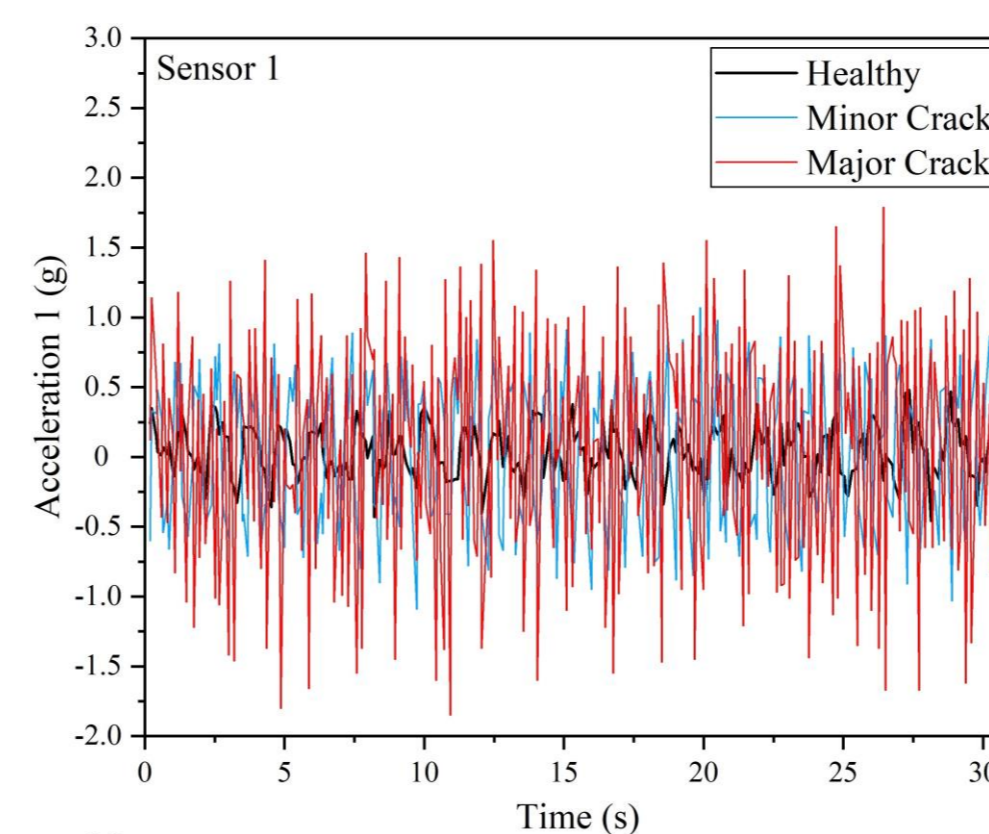
Invention

The invention revolves around a real-time condition-monitoring or fault detection system for unmanned aerial vehicles (UAVS), particularly multirotor. This invention focuses on the vibration induced by a crack in the multirotor arms, measured by 8 ADXL335 accelerometers. Additionally, 8 current and infrared sensors are also installed to enhance the outputs of the algorithm. A novel sensor fusion algorithm will combine all parameters. Then, a fuzzy logic technique is employed to provide the decision-making, which can be monitored up to 1 km range using a smartphone through a developed mobile application.

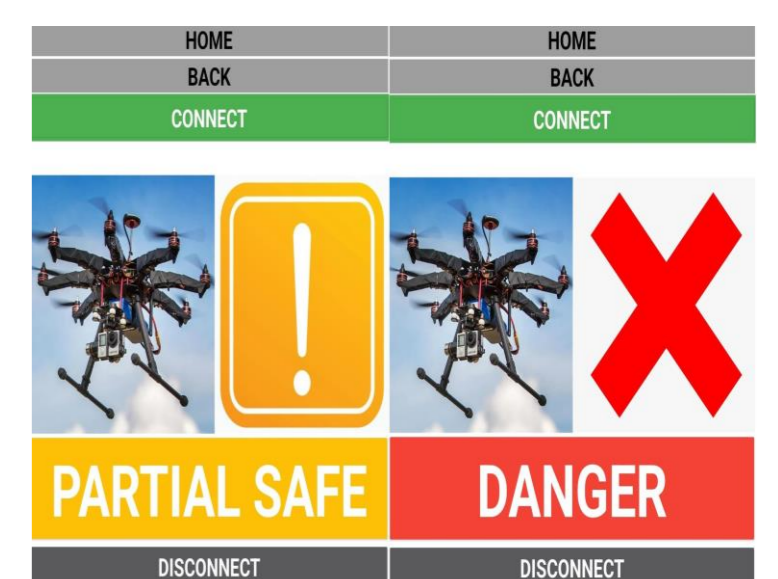


Key Features

- 1) Cover electrical and mechanical fault cases.
- 2) Up to 1 km range.
- 3) Monitoring using smartphone with suggested countermeasures.
- 4) Applicable in all drone modes.



Findings



Project Partners:



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