



# **DIN SANDPIT WORKSHOP**

[WWW.DEFENCEINNOVATIONNETWORK.COM](http://WWW.DEFENCEINNOVATIONNETWORK.COM)



# SYSTEM TO PREDICT FAILURES OF UNMANNED AERIAL VEHICLES

## PROBLEM:

An issue exists with determining the reliability in real-time of unmanned aerial vehicles as used by the Airforce, Army, and Navy. Most vehicles today use rotors, electric, gas, and turbine engines for propulsion and electromechanical components for operation. Unfortunately, predicting imminent or dormant failures of mechanical systems often occurs with little to no warning placing the platform at risk of failure in the field, like during critical missions.

## NEED AND RELEVANCE

As the Australian Defence Force expands its unmanned systems, the need for predictive maintenance prior to catastrophic failure of subsystems is critical to platform availability and reliability to mission success.

As these platforms are autonomous onboard sensors need to be sufficiently trained to listen to the platform's heartbeat and determinant imminent failures.

## RESEARCH QUESTIONS:

What type of system is required to predict imminent failures in the field before they become catastrophic?

Many issues need to be addressed such as:

- What type of sensors are required and how can they be easily adapted?
- What type of software algorithms are required?
- How can the data be processed in real-time so that operators and maintenance personnel know how to action it?