



# Time Series Anomaly Detection

Student: Lek Jie Kai

Supervisor: Assoc Prof Kwoh Chee Keong

## Project Objectives:

Detecting anomalies in time series data can indicate unexpected events such as system defects or production faults. This project aims to detect anomalies in industrial aircraft engines to reduce system downtime and increase reliability.

After identifying anomalies, which is used to indicated the onset of engine degradation, Remaining Useful Life (RUL) prediction of the engines will be done using a deep CNN. However, degradation pattern varies across different engines at each time. Hence, cycle-consistent learning is implemented along with the deep CNN to align degradation data of different engines with similar degradation rates.

## Proposed Models:

**Proposed Model (Anomaly Detection):** Autoencoder model to indicate the onset of engine degradation (onset of degradation for each engine is predicted)

**Proposed Model (RUL Prediction):** Deep CNN with cycle consistent learning to predict the RUL of all engines in the dataset.

## Results:

