

TRACER Tool: clusTeRing AirCraft fault messages: a graph-basEd appRoach

Project Description: Modern aircrafts are excessively instrumented with thousands of sensors, which measure the activity of each aircraft part (component). An important role for these sensors is to monitor the health of the aircraft. We focus on two types of messages generated from the sensors: maintenance messages (MMSGs) and flight deck effects (FDEs). In a typical flight, hundreds of maintenance messages may be generated and occasionally a flight deck effect will be reported because of certain event. When a flight deck effect is reported, the hidden cause of the FDE must be determined, but necessarily addressed, before the aircraft is allowed to fly again leading to an unscheduled interruption.

Since each MMSG and FDE belongs to only one aerospace subsystem, we speculate that the generated FDE was caused by a MMSG, or few MMSGs, which belongs to the same subsystem. Therefore, we exploited graph theory in clustering each aerospace subsystem separately.

Duties/Activities: The Intern will work on an existing code for TRACER and gets supervision from mentors in aggregating the code and build a Graphical User Interface (GUI), which visualize the dynamics of both MMSGs and FDEs for each flight leg as nodes in a graph. Then, the intern will test the developed interface on synthetic and real data sets.

Required Skills: Understand of how to build GUIs. Have good scripting language skills such as Python, R, or MATLAB. Have basic knowledge of machine learning algorithms.

Preferred Intern Academic Level: Bachelor degree.

Learning Opportunities: Learn how to do transfer a research outcome to a software and working with a group of scientists. In addition, have an opportunity to work on real data set from Boeing.

Expected Team Size: 3

Mentor

Name: Mohamed Elshrif

email: melshrif@hbku.edu.qa