Graph Theory For Predicting Flight Faults

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 graph theory discipline has been successful in solving many real-world problems from variety of applications. Therefore, in this project, we will exploit the MMSGs-FDEs relationship to build a novel model for predicting an FDE from MMSGs and vice versa. We will evaluate the model on synthetic dataset as well as on historical dataset from the Boeing Airplane Health Management (AHM) tool.

Duties/Activities: The Intern will work on an existing code and gets supervision from mentors in aggregating the code and build a Graphical User Interface (GUI).

Required Skills: Have good scripting language skills such as Python, R, or MATLAB. Have basic knowledge of graph theory and machine learning algorithms. Know some visualization tools.

Preferred Intern Academic Level: Bachelor degree.

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

Expected Team Size: *2-3*

Mentor

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