AMELIA: Using an IoT-Interfaced Cloud Computing Network to Create a Wireless, Realtime, World-Wide Aircraft Safety Data Monitoring System

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The purpose of this project is to develop a low-cost flight safety and location system which transmits salient mechanical data in instance of a in-flight emergency. The 2014 disappearance of Malaysia MH370 attests to the limitations of current flight data recorders, or “black boxes,” whose data can only be accessed once the aircraft is recovered. Due to MH370, many industry experts urge creation of a system that streams data to the ground in realtime, which incurs massive operational and installation costs of over $80,000 per aircraft, and requires prodigious bandwidth. AMELIA is a three-tiered system which is approximately 1/300 of the cost of the industry-proposed unit. AMELIA can immediately recognize the signs of equipment failure within the airframe and instantaneously transmit data, rather than a continual streaming of data. Supervisory Parametric Analysis algorithms recognize the warning signs of failure; another layer of logic is used to rate data in the order of urgency; data is then transmitted through Satellite (the Iridium Constellation). The data is retroactively compared in a distributed server network, generating solutions and scenarios based on heuristic, machine learning software. An AMELIA system allows controllers to activate emergency assets before a plane has crashed. The use of this system can create a neural network or “beehive” of information which is robust against cyberattack; information stored in the aircraft can only be accessed through internal inputs The AMELIA flight safety system will streamline maintenance operations, improve aircraft flight-path efficiency and improve safety for the trans-oceanic air transport industry.

Awards Won:

Fourth Award of $500