**Reducing the Environmental Impact of Aviation: A Data Mining Approach to Instantaneous Estimation of Fuel Consumption**

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The environmental impact of aviation is enormous given the fact that in the US alone there are nearly 6 million flights per year of commercial aircraft. This situation has driven numerous policy and procedural measures to help develop environmentally friendly technologies which are safe and affordable and reduce the environmental impact of aviation. However, many of these technologies require significant initial investment in newer aircraft fleets and modifications to existing regulations which are both long and costly enterprises. In Phase I of our project, we developed a new technique to detect overconsumption of fuel on an aircraft based on Virtual Sensors (VS) and performed extensive statistical validation of the method and demonstrated that the anomalies that VS discovers are statistically reliable and repeatable. In phase 2, we have developed extensions to this work to improve the quality of the results and are validating our work on some simulated and real flight data. In this talk, We will present all the completed work on this task and some plans for upcoming work.