

Lecture Overview

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ABSTRACT

This brief presentation provides an overview of the material to be covered in the lecture series. The overall technology areas that fall under the umbrella of “Intelligent Engines” are too broad to be covered in a two day lecture. The focus of the lectures is on “On-Board Intelligence” to enable safe and efficient operation of the engine over the life time, and adapt to changing internal and external environment to provide “optimum” achievable performance based on operation mode and current condition. The discussion in the lectures is limited to description of technologies for active control of components in the gas path to enhance performance and reduce emissions and noise, intelligent engine control and condition monitoring from the overall engine gas path performance perspective, and advanced control architecture concepts such as distributed engine control.

The objective of the lectures is twofold: i) Help the “Customers” (NATO defense acquisition and aerospace research agencies) understand the state-of-the-art of intelligent engine technologies, how these technologies can help them meet challenging performance and operational reliability requirements for aircraft engines, and what investments need to be made in sensor and actuator technologies to enable the various capabilities of “Intelligent Engines” so that limited resources are used in a most efficient manner; and ii) Help the “Researchers” and “Technology Developers” for sensors and actuators identify what sensor and actuator technologies need to be developed to enable the “Intelligent Engine” concepts so that their research efforts can be focused closing the gap from current capability to that needed to meet identified requirements, and also increase their awareness of “requirements” that need to be met other than performance (such as cost, durability etc.) to enable the transition of technology to a product.

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