From Prognosis and Health Management to Fault Tolerant Control : Theory and applications

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Abstract:
Fault-tolerant control for complex nonlinear system is an emerging technology intended to provide the designer and operator with flexibility, interoperability, sustainment and reliability under changing operational requirements or mission profiles. Moreover, it is intended to reconfigure online hardware and software to maintain the operational integrity of the system in the event of contingencies (fault/failure modes). The fault tolerant control framework relies on diagnosis and prognostic information knows as Prognostic Health Management (PHM) to reconfigure system components and preserve the operational integrity of the nonlinear system. The hierarchical structure starts at the lowest component level and migrates to the middle system/subsystem level ending with the final mission level. The objectives of PHM is to lead searchers or industrials to strengthen their capability to anticipate the failures occurring in the system.

This session aims at presenting the emergence of PHM theme to FTC and the interaction between these themes.

This session provides opportunities for researchers and developers to present their recent developments in PHM and FTC applied for example to: Solar system, Wind turbine system, Fuel cell, Transportation Systems, Telecommunications Robotics, etc. Thus, this invited session aims to focus on the recent research and trends for the development and application of new methods for PHM and FTC.

How to elaborate a controller when the system is subject to faults. How to elaborate an Fault Diagnosis algorithm from models or no, how to design the strategy of FTC, what ae the limits and the complementarities of each method,...?.Such are the questions we want to contribute and discuss during this session where the aims and scopes (include but not limited to):

1- FDI
2- Prognosis.
3- Fault Tolerant Control : passive or active
4- Interaction between PHM and FTC