Model Based Fault Detection and Isolation

Robust Model Based Fault Detection and Isolation

(8 Hours)

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Linear Polynomial Methods for FDI
With Aircraft Applications

(4 Hours)

Silvio Simani, University of Ferrara

RESIDUAL GENERATION
POLYNOMIAL BASIS COMPUTATION
INPUT–OUTPUT SENSOR FAULT DETECTION
RESIDUAL OPTIMISATION
RESIDUAL GENERATOR OPTIMISATION
RESIDUAL FUNCTION POLES AND ZEROS ASSIGNMENT
INPUT–OUTPUT SENSOR FAULT ISOLATION
BANK FOR INPUT SENSOR FDI
BANK FOR OUTPUT SENSOR FDI
FAULT SIGNATURE

APPLICATION EXAMPLES

POWER PLANT OF PONT SUR SAMBRE
POLYNOMIAL METHOD RESULTS
COMPUTATION EXAMPLES
AIRCRAFT SIMULATOR FAULT DIAGNOSIS
POLYNOMIAL METHOD RESULTS
COMPUTATION EXAMPLES

Unscented and Particle Kalman Filters
With Aerospace Applications

(4 Hours)

Paolo Castaldi

NonLinear Filtering problem
Why yet another KF
Unscented Transformation
UKF and UT
UKF algorithm
To UKF or not to UKF?
Particle Filter (or bootstrap filter)
Particle Filter Problem and overview
Particle Filter: algorithm
FDI by means of PF: a satellite application
LEO Satellite Orbit Determination by means of pf
Particle Kalman Filters: few words on
Extended Particle KF and Unscented Particle KF

Application Example: Aircraft actuator FDI

- Few words on Non Linear geometric Approach to FDI
- Nonlinear Geometric Approach–Based Particle Filtering for Aircraft Actuator FDI