THE KALMAN FILTER
PARAMETER ESTIMATION

This training is open to engineers, researchers, technicians and students who wish to become initiated to the Kalman filtering or improve their knowledge on the subject. Many problems consist in estimating or predicting the state of a dynamical system from noisy experimental data. The Kalman filtering is a technique commonly used to estimate the state but also the mathematical model parameters representing the phenomenon studied and to quantify the present uncertainties. Its application areas are quite diversified: signal processing, physics, biology, meteorology, robotics,...

KNOWLEDGE REQUIRED
background in mathematics corresponding to a bachelor level.

OBJECTIVES
Get a good knowledge of the linear discrete Kalman filter and extended Kalman filter.

PROGRAM
Pedagogical Approach : lessons using theoretical concepts with examples.

Practical work :
• Course Application
• MATLAB Programming

Theoretical courses
• Filtering introduction
• Background of probability
• Gaussian linear systems
• Kalman-Bucy filter
• Linearized Kalman filter
• Extended Kalman filter

Practical work
• Modeling and implementation of the Kalman filter in linear cases.
• Modeling and implementation of the

Extended Kalman filter (nonlinear cases).
• State, parameter and uncertainty estimation examples.

Course Supervisor
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Member of the group Dependability & Reliability Midi- Pyrénées
Teaching of applied mathematics and signal processing

from the 12th to 14th march 2018 or
from the 14th to 16th may 2018
Duration :
3 days - 20 hours
Cost : 1500 €
Lunches and educational material included

Practical informations and registration:
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