RELIABILITY AND MAINTENANCE OF DYNAMIC SYSTEMS: ADVANCED METHODS AND RECENT DEVELOPMENTS

43rd International Summer School
of Automatic Control
Grenoble, France
September, 5-9, 2022

http://www.gipsa-lab.fr/summerschool/AUTO22/

Scientific Chairs:

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Local Organizer: Mirko FIACCHINI (GIPSA-lab, Grenoble, France)

Confirmed Speakers:

- **Anne BARROS** (CentraleSupelec)
- **Laurent DOYEN** (Univ. Grenoble Alpes)
- **Olga FINK** (EPFL Lausanne, Suisse)
- **Olivier GAUDOIN** (Univ. Grenoble Alpes)
- **Antoine GRALL** (Univ. Technologie de Troyes)
- **John MARTINEZ-MOLINA** (Grenoble INP - UGA)
- **Nazih MECHBAL** (ENSAM ParisTech)
- **Marcos ORCHARD** (Univ. of Chile, CHILI)
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Research works in systems reliability and dependability aim to better understand and anticipate the phenomena leading to system failure, as well as to develop models and methods for the predictive assessment of system reliability, for the optimization of their maintenance and performance, and for the optimal management of their health state. For more than a decade, approaches to dependability have been confronted with a paradigm shift

- Systems are increasingly complex, interconnected, instrumented, monitored, and controlled. Many heterogeneous data and information are available on their health, evolution and performance. These systems can no longer be considered as "static" (as it is often the case in classical approaches to system reliability) and their dynamic behavior must be integrated into models and decision support methods in dependability.
- Interactions between the discipline of "dependability" and other disciplines such as automatic control, signal processing, artificial intelligence, and operations research have been widely developed.

This paradigm shift has profoundly modified the vision of systems reliability and dependability, leading to the emergence of new approaches: PHM (Prognostic and Health Management), Predictive Maintenance, RxM (Prescriptive Maintenance), Reliability-Aware Control or Degradation-Aware Control, Post-Prognosis Decision Making, etc.

The objective of the school is to provide participants with an awareness of the different approaches recently developed in the field of dependability of dynamic systems and to train them in the tools and methods on which these approaches are based. The following themes will be studied:

- Reliability, maintenance and safety: old problems, classical methods and new challenges
- Dynamic reliability modelling with application to the resilience of critical infrastructures
- Prognostics and health management: from monitoring to post-prognostics decision-making
- Artificial intelligence approaches to reliability and predictive maintenance
- Reliability and degradation aware control, RUL control and reliability adaptive systems
- Reliability and safety of autonomous systems
- Advances methods for stochastic deterioration and (imperfect) maintenance modelling
- Structural Health Monitoring (SHM) and damage aware active control

Organization:

The School will consist of a series of surveys, lectures and research talks taught in English, completed by a series of applications sessions.

Audience:

The School is mainly intended for PhD students, researchers and industrial participants wishing to initiate, consolidate or reorient their research project in the field of reliability and maintenance of dynamic systems. Basic knowledge in system reliability theory, automatic control and mathematics is useful.

About Grenoble:

Capital of the French Alps, with about 500 000 residents and 60 000 students, Grenoble is surrounded by the well-known mountain ranges: Chartreuse, Vercors and Belledonne. Grenoble can be easily reached by plane from two airports: Lyon Saint-Exupery (LYS) or Geneva Cointrin (GVA Switzerland).

Deadlines: ***Registration:*** ***July 11th, 2022***

Registration Fees: (including ***access to lectures, accommodation, lunches and Gala Dinner***)

Students:	**350 €**
Academics	**500 €**
Industry participants and French participants with EPIC affiliation:	**1000 €**
CNRS:	**Free**