19 / 23
Sept. 2021
ANGERS
FR

esrel

European Safety and Reliability Conference

esrel2021.org

CALL FOR ABSTRACTS

Special session on

AI for safe, secure and dependable operation of complex Systems

Description

This special session will offer a place for discussions and exchanges on how artificial intelligence approaches and techniques can be leveraged in order to operate complex systems in a safe, dependable and secure way. It will also include corresponding challenges to both industry and academia

Motivation

Increasingly connected societies and ever-more highly interdependent complex systems raise challenges in many different areas: industry 4.0, multi-modal transportation, telecommunications, energy generation, transmission and distribution, and much more.
As complexity increases (to the point of leading sometimes to “systems of systems”), at the same time the requirements which those systems have to meet are ever more stringent, as new threats must be confronted in addition to managing traditional risks.

In the new environment, cyber-attack threats need to be anticipated, detected and countered; at the same time, man-made and natural hazards must be coped with; and systems need to be operated and managed efficiently to achieve very high dependability at reasonable life-cycle costs.

To meet those sometimes conflicting goals, a holistic vision of operation and maintenance is in order. Decisions must be made at different levels and on different time horizons with all of the above objectives in mind.
Addressing that problem leads to highly distributed dynamic decision making under uncertainty, dealing with nonlinear feedback loops at several levels.
Traditional approaches usually fail to rise fully to these challenges, and this is where AI may help, by leveraging the significant progress made recently in techniques such as deep learning, deep reinforcement learning, transfer learning, physics-informed machine learning, geometric learning and more.

Objective

This session proposal aims at opening a session to address these emerging issues related to the use of AI approaches for safe, dependable and secure operation of complex system. Gathering both researchers and practitioners, theoretical advances, new developments as well as opened issues related to AI approaches for complex systems operations, including the maintenance and asset management aspects, will be addressed in the framework of this special session.

Organizers:

Dersin Pierre pierre.dersin@alstomgroup.com ALSTOM and Luleå Technology University (LTU), pierre.dersin@ltu.se
Fink Olga fink@ibi.baug@ethz.ch ETH-Zürich
Bérenguer Christophe Christophe.Berenguer@Grenoble-inp.fr Univ. Grenoble Alpes - Grenoble INP

The validation of the special sessions will be done under the responsibility of the technical and scientific committee. Organizers are invited to provide a list of reviewers that may be supplemented by TC members to ensure consistency in the evaluation process.