CentraleSupélec

FONDATION EDF
Science - Enseignement
en partenariat avec l'Institut de France

INVITATION

Enrico Zio, le Directeur de La Chaire Science des Systèmes et Défi Énergétique (SSDE) soutenue par la Fondation EDF

Invite you to apply for a Ph.D. scholarship

at CentraleSupélec,

Université Paris Saclay

- The scholarship is provided for three years by the French government (around 1400-1500 euros per month, net).
- The candidates must have a master's degree in relevant domains.
- The selection will be based on the quality of the candidate's CV and research proposal.
- The research topics of interest for the Chaire SSDE are in the fields of risk/reliability/resilience modeling, analyses and optimization of complex systems, in particular (but not exclusively) for energy applications (www.ssde.fr).
- The potential candidates are asked to:
    - contact Dr. Yiping Fang, Dr. Zhiguo Zeng and Prof. Enrico Zio (yiping.fang@centralesupelec.fr, zhiguo.zeng@centralesupelec.fr, enrico.zio@centralesupelec.fr).
    - prepare their research proposals (in both text and ppt format) and CV, and send them to Dr. Yiping Fang, Dr. Zhiguo Zeng and Prof. Enrico Zio (yiping.fang@centralesupelec.fr, zhiguo.zeng@centralesupelec.fr, enrico.zio@centralesupelec.fr) by the deadline of **March 27, 2018.**
- Key dates:
    - April 10, 2018: Deadline for final submission of the applications on the official webiste.
    - Late June, 2018: Announcement of the selection results.

Chair on Systems Science and the Energy Challenge

Our Chair is a co-founder of Sino-French Risk Science and Engineering Lab (RISE Lab) in collaboration with Centrale Pekin.
Our team develops new methods, frameworks and modeling architectures, techniques and algorithms, for the safety and risk analysis of complex engineered systems, based on a holistic and systemic viewpoint. The modeling, simulation and optimization methods, frameworks, architectures, techniques and algorithms that we develop, integrate a number of competences for viewing and solving the problems from the different, multidisciplinary system perspectives (topological and functional, static and dynamic, etc.) that are needed, and giving due account to the existing uncertainties. The range of application includes industrial systems like renewable energy systems, electric power grids, smart grids, nuclear power plant components, oil and gas systems, automotive and railway transportation systems.

Our research is organized around 2 main topics:

1. Energy network systems, focusing on modeling, simulating and optimizing of electrical network systems, i.e., power grids, microgrids, smart grids. The analysis of these systems cannot be carried out only with classical methods of system decomposition and logic analysis; a framework is needed to integrate a number of methods capable of viewing the problem from different perspectives (topological and functional, static and dynamic, ...) and properly treating the related uncertainties by probabilistic and non-probabilistic methods.
2. Aging and failure processes in components of energy production plants, aiming at modeling and assessing component degradation, analyzing and building maintenance solutions, and carrying out system simulation for reliability, availability, maintainability and safety (RAMS) analysis by multi-state, physic, Bayesian and Markov chains models, Monte Carlo simulation. A particular focus is on failure prediction and prognostics of critical components, by data-driven approaches, e.g. adaptive artificial neural networks, support vector machines and the like.

Enrico Zio
Chair Director

Members:

3 Faculties: Yiping Fang, Zhiguo Zeng, Enrico Zio

8 PhD students: Islam Abdin, Tasneem Bani-Mustafa, Hoang-Phuong Nguyen, Muxia Sun, Zhiyi Wang, Jinduo Xing, Hongping Wang, Daogui Tang

1 visiting PhD students: Xiangyu Li
1 visiting scholars: Juan Chen

Chair activities and productions in 2017:

- **3** PhD thesis finished
- **8** PhD thesis in process
- **32** journal papers published
- **9** conference papers published
- **8** courses responsible