

Research Topic 07 for the ParisTech/CSC PhD Program

FOR APPLICATION, PLEASE CONTACT ADVISOR(S) BY EMAIL WITH COPY TO:

ali.siadat@ensam.eu AND yvon.velot@ensam.eu

Subfield:

System engineering, computing engineering, dependability engineering

ParisTech School:

Arts et Métiers ParisTech (Metz campus)

Title:

News models for incremental certification processus for the highly distributed virtualized systems

Advisor(s):

Malassé Olaf, olaf.malasse@ensam.eu

Short description of possible research topics for a PhD:

The IT systems use architectures virtualized on open networks today and the intelligence is strongly distributed there. The control systems (OT) forced by imperatives of availability, safety & security, survivability and resilience requirements and integrate these technologies when we are able to demonstrate its mastery. It is thus a question of developing methods and models taking into account additional treatments due to the virtualisation, and of the elongation engendered by the use of networks (cloud computing, fog computing). These methods and models must be integrated into a process of modular and incremental qualification to reduce the time required for certification, today long and expensive. This process must be compatible with a set of standards, such as IEC-61508, EN-50126, IEC-62443 ... essential for critical applications.

Required background of the student:

Methods and models (state machines, Petri nets ...) of the dependability, probabilities

A list of 5 (max.) representative publications of the group:

- [1]. Olaf Malassé; Grégory Buchheit; Michael Pock; Max Walter. Dependability evaluation of complex embedded systems and microsystems. 2010 Proceedings - Annual Reliability and Maintainability Symposium (RAMS).
- [2]. Grégory Buchheit; Olaf Malassé; Nicolae Brinzei; Nadia Ammad. Dependability assessment of large railway systems. 2013 Proceedings - Annual Reliability and Maintainability Symposium (RAMS).
- [3]. Mehdi Jallouli; Hicham Belhadaoui; Camille Diou; Fabrice Monteiro; Olaf Malasse; Jean-Francois Aubry; Abbas Dandache; Gregory Buchheit; Hicham Medromi. Dependability consequences of fault-tolerant technique integrated in stack processor emulator using information flow approach. 2008 3rd International Conference on Design and Technology of Integrated Systems in Nanoscale Era.
- [4]. K. Hamidi; O. Malasse; J. F. Aubry. Contribution to an improvement of quantitative evaluation model for reliability of safety-related functions. 2004 IEEE International Symposium on Industrial Electronics.
- [5]. F. Jumel; J. M. Thiriet; J. F. Aubry; O. Malasse. Towards an information-based approach for the dependability evaluation of distributed control systems. Proceedings of the 20th IEEE Instrumentation Technology Conference.