**Announcement of NTNU-CSC PhD Scholarship**

**Type of scholarship:** Degree seeking PhD

**Period of the scholarship:** August 2020 – July 2022

**Place of study:** NTNU Trondheim

**Short description of the scholarship:** The scholarship will be granted to a candidate who seeks a PhD degree in NTNU. The main research topics will be around **predictive maintenances of interdependently cyber-physical systems for public safety.** Nowadays, many critical systems are used in different sectors, such as process industries, transportation and healthcare. The failures of these systems, e.g. pressure release valves in oil&gas pipelines, and gas detection systems and ventilation systems in large hospitals, may result in serious accidents and disasters to the community. Predictive maintenances based on the monitoring conditions of critical systems can reduce the likelihood of unexpected failures, but such approaches are being challenged by cyber-physical features and interdependencies between different systems. Cyber-physical systems (CPSs) integrate physical systems with computerized elements for added and improved performance, so that these systems are not only impacted by hardware failures but weakened by software and communicative problems. The existing studies often simplify the operational contexts of these critical systems, which do not fail immediately due to an individual failure, but are more vulnerable to an interdependent failure, e.g. cascading failure. One of the tasks of prognosis and predictive maintenances is thus to reduce the risks related to interdependencies, instead to avoid each single failure costly. To realize the optimization of predictive maintenances, it is necessary to understand the degradation on a subsystem level and interconnection with the rest of the system to build the predictive layer. The power of artificial intelligence including machine learning and tools from big data analysis is expected to understand degradation on a more fundamental level. The goal is to build models for dependent degradation phenomena, that can be used for describing remaining useful life of critical CPSs in decision making tools for optimal operation and maintenance scheduling.

**Qualification and requirement:**

- A completed master’s degree or second degree (equivalent to 120 ECTS credits) with a strong academic background in reliability and safety engineering, industrial engineering, systems engineering, or equivalent education with a grade of B (80/100) or better, of which transcripts and degree certificates are required.

In addition, for all applicants the following applies:

- Fluent English language, both written and spoken with certificates of TOEFL minimum 95 or IELTS minimum 6.5
• Chinese citizenship documents (copy of his/her passport or national ID of P.R. China
• CV
• A motivation letter

**Deadline for submission of application:** 15th February 2020

**Scholarship:** 17,000 NOK/month up to 36 months (12,500 from CSC and 4500 from NTNU)

*According to the NTNU-CSC agreement*
CSC will provide a living stipend, currently 12,500 NOK per month for a period of up to forty-eight (48) months, and a round-trip international airfare between China and Norway. NTNU will provide a monthly additional funding for a period of up to forty-eight (48) months, which combined with the CSC living stipend ensures the sufficient income (currently minimum 17,000 NOK per month) required by NTNU. No tuition fees will be charged for PhD candidates at NTNU.

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