**Reference: QSE:CPSS Survey**

**Topic: A Systematic Literature Study of Cyber-Physical Social Systems**

LVA-Type: Master's Thesis, MSc Project

Start: As soon as possible

End: By arrangement

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**Background**

In recent years the overall topic of *cyber-physical systems* (CPS) [1] has received great attention in research. These emerging systems are basically smart networked (embedded) technical systems consisting of sensors, actuators, and controllers within physical structures that are linked with virtual objects and processes across information systems. They collect information from their environment and analyze the integrated data to be able to adapt to changing contexts or requirements. CPS have started to diffuse into many application areas, including public transportation, energy services, and manufacturing industry.

A new direction in CPS research aims to extend those systems with a social dimension evolving them into *cyber-physical social systems* (CPSS) [2]. Such systems consist not only of software and raw sensing and actuating hardware, but are fundamentally grounded in the behaviour of human actors who both generate data (e.g., by interacting with social networks) and make informed decisions based on data. This raises new research challenges due to additional complexity introduced by social systems in terms of (a) unpredictability due to social dynamics, (b) privacy concerns associated with the processing of sensitive social data, and (c) the number and heterogeneity of data sources that need to be integrated.
The goal of this work is to provide a comprehensive literature study on CPSS research using the established empirical method of a systematic mapping study [3]. In such a study you systematically design, survey and review existing literature with focus on CPSS definitions, characteristic system features, identified functionalities, formats, data models, workflows, application domains and usage scenarios. Based on the study results, limitations and future research directions should be derived and discussed.

At the end of this literature study, you will have acquired good skills and experiences in the basics of empirically-grounded literature reviews as well as a basic understanding of the latest research in the areas of CPS and CPSS.

Tasks

− Design of a systematic mapping study using an established method from empirical software engineering.
− Search and collection of existing literature.
− Data analysis.
− Reporting of study results.

Experience and skills needed

− Good written and spoken English skills.
− Experience / interest in Social Web, Collective Intelligence and Cyber-Physical (Social) Systems.

Links

All resources are accessible via TUNet or TU VPN.


https://doi.org/10.1109/MIS.2010.104 (last visited 24.9.2017)