

Support of Assurance-based Software Development for Cyber-Physical Systems

Wuwei Shen PhD

Professor, Western Michigan University

wuwei.shen@wmich.edu

Abstract

Cyber-Physical systems (CPSs) become more important in our daily life. Failure of CPSs can have some serious consequences such as loss of human life. To ensure the trustworthiness of a CPS, an assurance case has been proposed as a communication means between different stakeholders such as developers and certifiers. In this talk, we will introduce a novel framework that supports the integration of an assurance case into software development lifecycle by means of the Model-Driven Architecture. The framework not only provides an automatic mechanism to generate an assurance case in the Goal Structural Notation (GSN) but also supports the evaluation mechanism using the Dempster-Shafer (D-S) theory. The framework dramatically reduces the burden of the developers and certifiers when developing a CPS.

Biography

Wuwei Shen received his PhD from the Univ. of Michigan in computer science. He has been working on various techniques such as the Model-Driven Engineering (MDE) to increase automation in software development, implementation, and validation in various application domains. Dr Shen received the Senior Research Award from the National Research Council (NRC) Associateship Programs, the National Academies of Sciences, Engineering, and Medicine in 2017. He also received several fellowships from the Visiting Faculty Research Program (VFRP), the Air Force Research Laboratory's Information Directorate (AFRL/RI) from 2015 to 2018.