Design and process metamodels for modelling and verification of safety-related software applications in smart building systems

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ABSTRACT
Smart building is an example of a cyber-physical system that adopts the internet of things in order to every component, each person, and every process can be accessed from everywhere. This paper proposes a novel software engineering approach for the design of the smart building systems, namely, the metamodels for modelling and verification of smart building safety-related software applications. Two different metamodels are proposed: the design metamodel and the process metamodel. Their use allows not only to define a design structure and safety properties of smart embedded devices but also to model and validate corresponding safety scenarios. To demonstrate an effectiveness of the proposed approach, a case study is done to model and verify a prototype of a safety-related software system in a smart building.

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