Model-Driven Engineering for IoT Systems

Research Oriented

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Abstract:

The Internet of Things (IoT) is set of heterogeneous, distributed, characterized by an unprecedented and intelligent thing such as simple actuators, sensors, and RFID tags, as well as more complex devices such as computers, self-driving vehicles, and autonomous robots. In IoT systems, heterogeneity embraces both software and hardware. Such diversification isn’t trivial to handle and is exacerbated by an elemental peculiarity of the IoT: the very same software functionalities are expected to be deployable on different devices, each of them having only a limited set of core common characteristics. Moreover, things can be small or have limited resources; that is, they can have limited battery capacity, storage resources, or computational capabilities. This adds a level of complexity to deployment and re-deployment of software functionalities on differently capable devices.

On the other hand, to benefit from the great advantages the IoT will unleash, we must deal with a whole set of new challenges at all levels. Heterogeneity, runtime adaptability, reusability, interoperability, data mining, security, abstraction, automation, privacy, middleware, and architectures are just some of the aspects we need to consider at both design time and runtime and for which new software engineering approaches will be envisioned.

Our work for this will be based on an extensive study of the IoT literature, and a Project-Based Learning approach is performed for understanding the various issues that are related to the software engineering when developing an IoT architecture to a home level or industry level. We also work to understand the present state of software engineering in IoT and discuss the challenges, impacts of how software engineering can help in installing, maintaining and managing the IoT system in real-world.

References:


