



Bachelor-, Master- und Doktorandenseminar  
des Instituts für Informatik

## Introducing Event-Based Communication and a Publish/Subscribe Mechanism into the DAiSI

Andrea M. Hernandez Garcia, B.Sc., TU Clausthal

The Internet of Things (IoT) introduces a new dimensional axis in the telecommunication environment in which not only devices are used to access information from anywhere at any time, but also “things” or any other object will be part of the Internet to communicate and cooperate together. This new axis promotes the realization of smart applications and services for improve the quality of life and management of resources. Through the use of electronic devices many aspects from the world can be observed and sensed; from tracking of goods to monitoring blood pleasure from different locations at any time. The continue increase of heterogeneous and distributed devices created by multiple manufacturers, increase the risk of non-interoperability in IoT applications. For instance, the dynamic behavior of things, which enter or leave the system, may lead to unavailability of services, which might impact critical applications like those dedicated to support emergencies such as health monitoring or security issues, for example. To address this challenge a framework for sustainable interoperability in IoT applications is required. The research group of Prof. Dr. Andreas Rausch developed a framework for dynamic adaptive systems called DAiSI as a common communication infrastructure able to cope with the interoperability of devices and support the development of distributed systems. DAiSI currently supports request/reply interaction, which is not suitable and scalable for IoT applications because it only enables one to one communication, the components are tight coupled and a constant polling of remote data is needed, which may lead to unnecessary waste of resources. Instead event-based systems frequently used in embedded systems support a contrasting interaction than request/reply, in which components notify the occurrence of an event to the interested components and an event transmission system is responsible to forward the event avoiding a constant polling. Event-based systems enable n:m communication, decouple the components and can support DAiSI to make it more scalable and suitable for future Internet of Things applications.

This thesis integrates the advantages of the existing DAiSI and event-based systems and presents a new approach to promote the development of dynamic adaptive systems(especially DAiSI) under event-based communication and publish/subscribe mechanism. The proofs of the new approach are also presented and the implementation is based on the field of Internet of Things, specifically smart cities.

Dienstag, den 20.12.2016, 10:30 Uhr im  
Besprechungsraum 2.04, IPSSE, Wallstraße 6, Goslar