Editorial

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The Internet of Things has many facets and most of the time all applications require tailored performance engineering, security as well as computing schemes to work with sufficient reliability to provide an appropriate level of intelligence of networks, applications and services in different contexts. Especially if considering industrial or health applications, the growing demand for performance, security and reliability as part of that becomes obvious.

The innovations concerning communication networking allow the Internet of Things to increase the responsiveness and flexibility of any kind of components. But the research discussion on IoT lacks for suitable systems, architectures, protocols and algorithms, which are able to tackle the demand regarding reliability.

Architectures, protocols, standards, performance engineering approaches as well as many other things have not been designed for usage according to the requirements of consumer systems that do not require a huge level of reliability. Nevertheless, IoT for industrial or medical applications suffer from this situation because solutions do not account for the special requirements introduced by them.

In this special issue, we are touching different types of approaches for a wide range of applications. The papers included address the topic of reliability of those intelligent systems for industrial, medical or health applications.

In his work “A Bridging VPN for Connecting Wireless Sensor Networks to Data Centers”, Hiroaki Hata addresses the challenge of current solutions of industrial IoT that requires a fully implemented IP stack to run properly. Cur-

rent approaches neglect that IP is not essential for a wireless node to run and, thus, could be improved in terms of power consumption and performance to optimize the reliability of each node. Hata proposes a new bridging VPN for connecting wireless networks for certain intelligent application contexts and improves the reliability of the whole network with attached wireless nodes by utilizing an IP network to transport the data link frames of wireless networks. Thereby, having more reliable communication without having some IP stack is introduced.

On the other hand, Lav Gupta et al. address certain additional topics for a more abstracted version of future networks in their work on “Fault and Performance Management in Multi-Cloud based NFV using Shallow and Deep Predictive Structures”. Having environments that require high reliability while using Network Function Virtualization (NFV) over multiple clouds accentuates, reliable performance levels can hardly be accomplished and cannot replace traditional networks. Missing FCAPS standard-based mechanisms in virtual networks are a reason for that. Gupta et al. propose a novel fault detection and localization model based on a combination of shallow and deep learning structures that improves reliability using machine learning.

Based upon on the application level, Hajime Kanzaki et al. propose specialized Video Streaming Schemes for Industrial IoT. Wireless video applications are generating novel application contexts and services, especially for industrial or medical environments. For an appropriate benefit and usage for mission critical contexts, performance is the relevant measure for reliability of intelligent systems. Current approaches lack content-based decisions for video transmission. Missing appropriate approaches in current research, Kanzaki et al. present a novel model that adds control wireless video transmission rate using attributes of captured object for further decisions. This allows faster and

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more reliable decisions based on the content of the wireless video transmission. Finally, Farad Rafique Jusob et. al. present a work on Exploring the need for a suitable Privacy Framework for mHealth when managing Chronic Diseases as an example on improving an issue of current medical applications. Using mobile health (mHealth) technologies that can use real-time data from patients and monitor them from a distance not only helps for remote medical control, but also for fast reaction in case of an emergency. mHealth applications bring various challenges for reliability and privacy concerns with them which increase the demand for appropriate solutions in reliable intelligent environments. Jusob et. al. compare privacy frameworks applicable to mHealth applications and discuss reliabil-

ity of these in case of privacy, and finally show that the demand for special reliability improving frameworks is given.

In the future, reliability will be the crucial point in any kind of Internet of Things environment because everything will depend on the benefits some component generates. Having in mind that, first, more wireless transmission systems will arise, second, 5G networks offer a novel kind of networking, and third, network function virtualization, chaining and network slicing become challenges in IoT network, component and application design. Thus, research must focus on those special applications more than in the past because otherwise reliability in those IoT-driven intelligent environments will be an issue that may kill parts of IoT.