

SSIT: Smart Spaces and Internet of Things

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Internet of Things (IoT) is an emerging business domain that is growing fast into a large industry with huge potential economic impact expected in near future. The IoT technology evolves to a substrate for resource interconnection and convergence. IoT provides an infrastructure to uniquely identify and link physical objects with virtual representations. As a result any physical object can have virtual reflection in the service space. This gives an opportunity to replace actions on physical objects by operations on their virtual reflections, which is faster, cheaper and more comfortable for the user.

Users' want to go beyond the existing web-like services, which often do not provide satisfactory coupling and automatic composition when the user tries to solve tasks from her/his everyday life. New generation of services (named "smart services") are now appearing. This special session considers the Smart Spaces paradigm and corresponding platforms, which is now shaping into a technology for creating smart spaces with focus on development of smart services for various application domains. Our special interest was to get together researcher that are sharing understanding of an importance and value of this trend. Additionally we targeted to get people with practical hands-on experience in developing prototypes of such solutions primary using open source packages.

A smart space is deployed in an IoT-enabled computing environment, creating an infrastructure for application to construct and deliver value-added services based on cooperative activity of environment participants, either human or machines. In this session we are target to discuss the suit of concept models, programming techniques and application development tools. In particular we are going to discuss the Smart-M3 platform and what makes it a valid technology for transformation of today's Internet. The discussion is supported and referenced with several already implemented application case studies from such topical domains as collaborative work, social networking, mobile e-tourism, mobile health and wellbeing and industrial Internet.

This year program of special session on Smart Spaces and Internet of Things consists of 4 papers. The first is titled 'Performance Evaluation Suite for Semantic Publish-Subscribe Message-oriented Middlewares' is prepared by the team of University of Bologna (Italy). The paper is strong solid research work with highly relevant practical results for Smart-M3 smart spaces platform.

The second paper is titled 'Personalizing the Internet of Things Using Mobile Information Services' and is a product of joint research between Petrozavodsk State University, ITMO University (Russia) and FRUCT Oy (Finland). This paper considers the emerging case of Internet of Things (IoT) environments and presents study on personalization of such environments using mobile information services within a smart space. The construction and delivery of these services are provided by participants themselves, following the concepts of multi-agent systems, peer-to-peer networks, and autonomic computing. This study identifies the key properties of a smart space to serve its mobile users and to provide them with all needed information assistance.

The third paper is named 'An Experimental Study of Personalized Mobile Assistance Service in Healthcare Emergency Situations' and is a joint work of Petrozavodsk State University and Yaroslavl State University (Russia). The paper introduces and analyzes a use case of smart mobile health (m-Health) service. The service enabled efficient involvement of trained volunteers in provision of the first medical aid and resuscitation, dispatching them depending on the proximity to the patient in emergency condition, and providing practical advices and guidance. The design concept

of this service is heavily relies upon the smart spaces paradigm, namely, the personalized assistance in medical emergencies is delivered to mobile participants operated in networked environment as a result of knowledge reasoning over the shared information. In this paper, the authors study the architecture and key features of the service and its smart m-Health space. We experimentally evaluate the Smart-M3 based implementation to analyze the feasibility and applicability of such mobile information services for the case of medical emergencies.

The concluding paper of the session is titled 'Role of Mobile OS and LBS Platform in Design of e-Tourism Smart Services' and is a joint work done by Tampere University of Technology, FRUCT Oy (Finland), and ITMO University (Russia). The paper discusses opportunities and challenges in development of the current ecosystem of digital services. The special attention is paid to analysis of the role of Location Based Services (LBS) platforms for service ecosystems in the Internet of Things (IoT) era. In the paper you can find a study of LBS-enabled smart systems architectures and analysis of factors that could enable faster adoption of new service paradigms by the industry. The paper discusses potential roles of IoT infrastructure for addressing this problem. The additional supporting questions addressed by this study is the role of mobile operational systems in development of future ecosystem of the services, which is done based on reviewing two approaches implemented in open source mobile operational systems: Sailfish OS and Tizen OS.

The section is targeted to provide a forum for academic and industrial researchers to discuss new ideas and trends in the emerging areas of Internet of Things and Smart Spaces that create new opportunities for fully-customized applications and services. This year, we managed to get together strong core team of researchers and developers from a number of countries around Europe. We are looking forward to see many attendees to our session so that together we will make our team even bigger to ensure creation of new project and development of future success together in the coming years.

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