

Introduction to the Smart (City) Application Development Minitrack

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1. Introduction

For three years now this minitrack focuses on the practical aspects of developing smart applications in different sectors including the public one. This year we have been specifically successful in attracting a wide variety of papers, ranging from proposing methods for smart application specification over reports on successful implementation to innovation hubs that are based on in-depth experience in smart city application implementations.

2. Minitrack Content

We decided to open the minitrack with a paper on designing applications in the field of smart manufacturing or Industry 4.0. It specifically pays attention to the physical aspects of the designed cyber-physical system by integrating methods for factory planning and automatic verification of the plausibility of the resulting model.

Our second paper proposes a system to simplify the setup of stream processing applications, enabling users without programming knowledge to perform such tasks using a graphical user interface. In the sample scenario an incoming data stream from an IoT sensor network gets routed to a processing pipeline that is setup by instances of predefined tasks that get deployed as Kubernetes pods. It also discusses the trade-off between simplified usage and reduced performance of the proposed architecture.

The third paper is a report on the successful implementation of a smart city application in the context of waste management. One of the successfully managed challenges here was to run a sensor network in a scenario where no electric power supply can be used. Apart from the technical solution the paper also presents the analysis of the generated data as well as some insights gained by it. It is a perfect example of how IoT and smart city applications could be used to improve public services.

This success story is followed by a critical review of an IoT technology called FIWARE. This paper is based

on the insights gained by various projects and discusses a couple of improvements that seem to be necessary to make this stack production ready. The recommendations made in this paper are ranging from mere feature request to identifying potentially serious security threats.

The last paper introduces the concept of an innovation hub for smart city applications. An interesting aspect of this concept is that it wasn't developed by a theory-first approach but is the outcome of experiences resulting from multiple and very successful software projects in the Polish city of Poznan.

3. Conclusion/Outlook

As the content of the papers in this track reveals, we are covering aspects of all phases of the lifecycle of smart application development. Starting from planning, going over to actual implementations, the minitrack also covers the evaluation of frameworks and finally presents lessons learned that led to what is called an innovation hub for smart city application development. Over the three years this minitrack exists we could observe that the maturity of smart (city) applications has improved and that approaches on how to implement them at methodological and technological level are also becoming clearer and more widespread. We hope that we can further report on progress made in this field in the next edition of this minitrack.