

Preface: Joint Proceedings of SR and SWIT 2016

This joint volume of proceedings gathers together papers from the 3rd Stream Reasoning workshop (SR 2016) and the 1st Semantic Web Technologies for the Internet of Things workshop (SWIT 2016), held on October 17th and 18th, during the 15th International Semantic Web Conference (ISWC 2016) in Kobe, Japan.

Stream Reasoning (SR 2016)

The continuous growth of volume, velocity and variety of data poses new challenges for their processing, especially when it has to be done in real-time or near-real time. It happens in many scenarios, such as IoT, social media analytics and smart cities: highly dynamic flows of heterogeneous data, supplied by different actors, have to be integrated and processed to create new knowledge. Reasoning techniques are a possible solution to cope with the problem of variety in the processing of these continuous streams of information. Anyway, while reasoners scale up in the classical, static domain of ontological knowledge, reasoning upon rapidly changing information has received attention only very recently. The combination of reasoning techniques with data streams gives rise to Stream Reasoning, a high impact research area that has already started to produce results that are relevant for both the semantic and data processing communities.

Moreover, an observation from the lessons learned on Stream Reasoning in these years is that the ordering of data over time is just one of the possible types of orders to harness in optimising the reasoning tasks. We perceive a trend in the community towards order-aware semantic technologies in works such as: top-k query answering techniques for Linked Data, SPARQL query answering on RDF annotated with partially ordered labels, and top-k ontological query answering in the context of Ontology Based Data Access.

The workshop aimed at bringing together this growing and very active community interested in integrating stream processing, ordering and reasoning by using methods inspired by data and knowledge management.

Semantic Web Technologies for the Internet of Things (SWIT 2016)

Current developments on the Internet are characterised by the wider use of network-enabled devices, such as sensors, mobile phones, and wearables that serve as data providers or actuators, in the context of client applications. Even though real-life objects can finally participate in integrated scenarios, the use of individual and specific interaction mechanisms and data models lead to realising isolated islands of connected devices or to custom solutions that are not reusable. Devices are increasingly network-enabled but rely on heterogeneous network communication mechanisms, use non-standardised interfaces and introduce new data schemas for each individual type of device. This results in a lot of heterogeneity, in the lack of overall integration and in solutions that cannot easily be extended and reused for different application domains.

To this end, the vision of the Internet of Things (IoT) is to leverage Internet standards in order to interconnect all types of embedded devices (e.g., patient monitors, medical sensors, congestion monitoring devices, traffic-light controls, temperature sensors, smart meters, etc.) and real-world objects, and thus to make them a part of the Internet and provide overall interoperability. Therefore, IoT aims to build a future of connected devices that is truly open, flexible, and scalable. The SWIT (SemanticWeb technologies for the IoT) workshop aims to contribute towards achieving this goal by exploring how existing well-established Semantic Web Technologies can be used to solve some of the

challenges that the IoT currently faces. In particular, the workshop aims to discover new ways to embrace the opportunities that semantic technologies offer in terms of data modelling, integration, processing, and provisioning as well as in terms of developing flexible and intelligent system solutions.

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