

Conference Report: 23rd International Joint Conference on Artificial Intelligence (IJCAI 2013), Beijing China

In August 2013, the EU FP7 project SIMPLI-CITY has been presented at the 23rd International Joint Conference on Artificial Intelligence (IJCAI 2013) in Beijing, China. At the conference, the project was represented by Dr. Freddy Lecue, IBM Research Ireland, Smarter Cities Technology Centre and WP4 Lead in SIMPLI-CITY.

In the following subsections, information about the activities at the conference is reported.

1.1 Activities

At IJCAI 2013, SIMPLI-CITY has been presented through different means. First, work related to the SIMPLI-CITY Use Case “Meeting the Increased Mobility Demand” has been presented in the full paper “Predicting Knowledge in An Ontology Stream” to an audience of 50 attendants. The presentation was related to first results of the technical work package WP4 (“Mobility-related Data as a Service”) and WP7 (“Use Case I: Meeting the Increased Mobility Demand”) and described SIMPLI-CITY’s approach to reasoning with mobility-related data, i.e., giving explanation of road traffic congestion in Dublin City.

Second, SIMPLI-CITY has been presented in the *Semantic Smart Cities* workshop at the conference. This workshop has been organised by Freddy Lecue and included an early demonstration of the traffic diagnosis system of SIMPLI-CITY.

1.1.1 Paper “Predicting Knowledge in An Ontology Stream”

Authors: Freddy Lecue, Jeff Z. Pan

Abstract: Recently, ontology stream reasoning has been introduced as a multidisciplinary approach, merging synergies from Artificial Intelligence, Database, World-Wide-Web to reason on semantic augmented data streams. Although knowledge evolution and real-time reasoning have been largely addressed in ontology streams, the challenge of predicting its future (or missing) knowledge remains open and yet unexplored. We tackle predictive reasoning as a correlation and interpretation of past semantics augmented data over exogenous ontology streams. Consistent predictions are constructed as Description Logics entailments by selecting and applying relevant cross-streams association rules. The experiments have shown accurate prediction with real and live stream data from Dublin City in Ireland.

1.2 Conference Report

IJCAI is one of the top-tier conferences for Artificial Intelligence (AI) and is one of very few research conferences which are sponsored by a large number of large IT companies, e.g., IBM Research, Google, Microsoft Research or Yahoo! Labs. In 2013, it brought together about approximately 700+ participants from all over the world.

Many papers presented at the conference described techniques from various AI domains, e.g., Machine Learning, Natural Language Processing. A small portion of these research works have been applied to real-world scenario, as the conference mainly targeted formal

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models. However, a few papers (such as, e.g., “*Improving Traffic Prediction with Tweet Semantics*” from Jingrui He et al., “*Exploring Knowledge Engineering Strategies in Designing and Modelling a Road Traffic Accident Management Domain*” from Mohammad Munshi Shahin Shah et al., and “*A Multi-Objective Memetic Algorithm for Vehicle Resource Allocation in Sustainable Transportation Planning*” from Hoong Chuin Lau et al.) were very interesting as they addressed some challenges very close to SIMPLI-CITY i.e., automated re-routing, multi-modal journey planning, traffic prediction.

Deep technical discussions with the authors of these papers were conducted in order to understand how their approaches could be easily applicable in SIMPLI-CITY. In some cases, however, it turned out that the data that are available for the applications in SIMPLI-CITY do not perfectly fit these models, hence showing again the importance of the challenge of integrating heterogeneous data from various sensors, which is addressed by SIMPLI-CITY work package “Mobility-related Data as a Service”.

The IJCAI 2013 Workshop on Semantic Cities was held during the IJCAI conference and attracted 20+ participants. The goal of this workshop was to (1) draw the attention of the AI community to the research challenges and opportunities in semantic cities, (2) draw the attention on the multi-disciplinary dimension and its impact on semantic cities e.g., transportation, energy, water management, (3) identify unique issues of this domain and what new techniques may be needed (e.g., for supporting data security, privacy), (4) promoting more cities to become semantic cities, (5) elaborating a (semantic data) benchmark for testing AI techniques on semantic cities and (6) provide a platform for sharing best-practices and discussion. Freddy Lecue has presented recent progress of SIMPLI-CITY regarding diagnosis of traffic congestion in cities. The presentation together with the demonstration was well received due to the live version.

The paper was well received and the community well appreciate the use of AI techniques to solve a real-world problem, here traffic prediction in the context of real-time data in Dublin City. The audience also appreciated the early results regarding the scalability to other cities e.g., Dublin City and Bologna City.

IJCAI2013Report4SIMPLI-CITYv04.docx		Date: 2014-01-21	Page: 2 / 2
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