

**Joint Proceedings of the
NLIWOD workshop,
QALD challenge,
and the
SemDeep-4 workshop**

co-located with the
17th International Semantic Web Conference

Preface

**Edited by:
Key-Sun Choi,
Luis Espinosa Anke,
Thierry Declerck,
Dagmar Gromann,
Jin-Dong Kim,
Axel-Cyrille Ngonga Ngomo,
Muhammad Saleem,
Ricardo Usbeck**

**4th International Workshop on Natural
Language Interfaces for the Web of Data
(NLIWOD) and 9th Question Answering over
Linked Data (QALD) challenge**
co-located with the 17th International Semantic Web
Conference

Preface

This workshop is a joint event of two active communities in the area of interaction paradigms to Linked Data: NLIWOD4 and QALD-9. NLIWOD, a workshop for discussions on the advancement of natural language interfaces to the Web of Data, has been organized three-times within ISWC, with a focus on soliciting discussions on the development of question answering systems. QALD is a benchmarking campaign powered by the H2020 project HOBBIT¹ including question answering over (Big) linked data, has been organized as a challenge within CLEF, ESWC and ISWC. This joint workshop promotes active collaboration, to extend the scope of currently addressed topics, and to foster the reuse of resources developed so far. Furthermore, we offer an challenge - QALD-9 - where users are free to demonstrate the capabilities of their systems using the provided online benchmark platform. Furthermore, we also focus on to dialogue systems and chatbots as increasingly important business intelligence factors.

In 2018, this workshop comprised one keynote by Peter F. Patel-Schneider, 3 full papers and 1 short paper. The best paper award went to Kyriaki Zafeiroudi, Leah Eckman and Rebecca Passonneau for their paper "Testing a Knowledge Inquiry System on Question Answering". Furthermore, we included and presented the results from the QALD-8 and QALD-9 challenge into this workshop proceedings to document the progress in the field of question answering on Linked Data.

Keynote - Connecting Industrial NL Applications to Knowledge (in Nuance)

This years keynote was given by Peter F. Patel-Schneider. Peter F. Patel-Schneider received his Ph. D. in Computer Science from the University of Toronto in 1987. From 1983 to 1988 he was a member of the Fairchild Laboratory for Artificial Intelligence Research and Schlumberger Palo Alto Research. Peter then joined Bell Laboratories and remained there until 2012 when he joined the Nuance Artificial

¹ <http://project-hobbit.eu>

Intelligence and Language Laboratory. Peter’s research interests center on representing large-scale knowledge and information, particularly taking large amounts of data and turning it into knowledge. He has made long-term contributions to description and ontology logics, particularly the W3C OWL Web Ontology Language. He developed much of OWL and its predecessor DAML+OIL, as well as SWRL, the Semantic Web Rule Language, and RDF, the W3C language for representing data in the Semantic Web. Peter has recently been working on extracting semantic information from data sources, allowing data to be more easily integrated into the Semantic Web.

Abstract: It seems natural to have speech- and natural language-enabled applications utilize knowledge repositories. The usual situation for fielded industrial applications is quite different, however, with applications employing data sources that are specific to particular, limited tasks. Peter will make some observations on why this is so and discuss some of the work going on in Nuance to move toward the use of knowledge repositories in industrial speech- and natural language-enabled applications.

Program

This workshop will take place on Tuesday October 9, 2018 from 14:00 to 18:00.

Time	Author	Title
09.00-09.05	Key-Sun Choi	Introduction
09.05-09.45	Peter F. Patel-Schneider	Keynote: "Connecting Industrial NL Applications to Knowledge (in Nuance)"
09.45-10.15	Richard Frost and Shane Peelar	An Extensible Natural-Language Query Interface to an Event-Based Semantic Web
10.15-10.30	Younggyun Hahm, Jiho Kim, Sangmin An, Minho Lee and Key-Sun Choi	Chatbot Who Wants to Learn the Knowledge: KB-Agent
10:30-11:00 Coffee Break		
11.00-11.20	Muhammad Saleem	QALD 9 Challenge Overview and Evaluation
11.20-11.50	Jiho Kim, Sangha Nam and Key-Sun Choi	Open Relation Extraction by Matrix Factorization and Universal Schemas
11.50 - end	Kyriaki Zafeiroudi, Leah Eckman and Rebecca Passonneau	Best Paper: Testing a Knowledge Inquiry System on Question Answering

Organizing Committee

- Key-Sun Choi, KAIST
- Jin-Dong Kim, Database Center for Life Science (DBCLS)

- Axel-Cyrille Ngonga Ngomo, DICE research group, Paderborn University
- Muhammad Saleem, Leipzig University
- Ricardo Usbeck, DICE research group, Paderborn University

Program Committee

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- Varish Mulwad, GE Global Research
- Roberto Garcia, Universitat de Lleida
- Giorgos Giannopoulos, Imis Institute, "Athena" R.C.

Data Experts

- Richa Jalota, Paderborn University, Germany
- Paramjot Kaur, Paderborn University, Germany
- Abdullah Ahmed, Paderborn University, Germany
- Danish Ahmed, Paderborn University, Germany
- Nikit Srivasta, Paderborn University, Germany
- Michael Röder, Paderborn University, Germany
- Jan Reineke, Paderborn University, Germany
- Alexander Bigerl, Paderborn University, Germany
- Afshin Amini, Paderborn University, Germany
- Geraldo De Souza, Paderborn University, Germany
- Felix Conrads, Paderborn University, Germany and InfAI e.V. Leipzig

4th Workshop on Semantic Deep Learning (SemDeep-4)

co-located with the 17th International Semantic Web
Conference

Preface

Semantic Web (SW) Technologies and Deep Learning (DL) share the goal of creating intelligent artifacts. Both disciplines have had a remarkable impact in data and knowledge analysis, as well as knowledge representation, and in fact constitute two complementary directions for modeling expressible linguistic phenomena and solving semantically complex problems. In this context, and following the main foundations set in past editions, the 4th Workshop on Semantic Deep Learning (SemDeep-4) aims at bringing together SW and DL research as well as industrial communities. SemDeep is interested in contributions of DL to classic problems in semantic applications, such as: (semi-automated) ontology learning, ontology alignment, ontology annotation, duplicate recognition, ontology prediction, knowledge base completion, relation extraction, and semantically grounded inference, among many others. At the same time, we invite contributions that analyze the interaction of SW technologies and resources with DL architectures, such as knowledge-based embeddings, collocation discovery and classification, or lexical entailment, to name only a few. This workshop seeks to provide an invigorating environment where semantically challenging problems which appeal to both Semantic Web and Computational Linguistic communities are addressed and discussed.

This half-day workshop consists of one invited talk by Marco Rospocher, one short paper presentation, and four long paper presentations. Marco Rospocher talks about results of applying Neural Networks to the task of learning expressive ontological concept descriptions from natural language text. A wide variety of topics related to the broader topic of combining Semantic Web technologies with Deep Learning techniques were submitted to this workshop. An extension of information considered when training knowledge graph embeddings to literals has been proposed as well as a new evaluation benchmark for knowledge graph embeddings based on link prediction methodologies. Within the domain of academic search, a new entity retrieval system combining paragraph and knowledge graph embeddings has been proposed and an ontology-based annotation system of academic publications utilizing deep learning forms part of this workshop. Finally, the best paper of this workshop was awarded to a neural network-based method to create semantic profiles of user interests emerging from pictures by combining object recognition methods with object category generalization.

Organizing Committee

Luis Espinosa Anke, Cardiff University, UK

Thierry Declerck, German Research Centre for Artificial Intelligence (DFKI GmbH), Saarbrücken, Germany

Dagmar Gromann, Technical University Dresden (TU Dresden), Dresden, Germany

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Alessandro Raganato, Sapienza University of Rome, Rome, Italy

Simon Razniewski, Max-Planck-Institute, Germany

Program

This workshop will take place on Tuesday October 9, 2018 from 14:00 to 18:00.

14:00 - 14:10 Opening and Welcome

14:10 - 15:00 Invited Talk by Marco Rospocher
Learning Expressive Ontological Concept Descriptions via Neural Networks

15:00 - 15:20 Michael Cochez, Martina Garofalo, Jérôme Lenßen and Maria Angela Pellegrino
A First Experiment on Including Text Literals in KGloVe

15:20 - 16:00 Coffee Break

16:00 - 16:30 Gengchen Mai, Krzysztof Janowicz and Bo Yan
Combining Text Embedding and Knowledge Graph Embedding Techniques for Academic Search Engines

16:30 - 17:00 Asan Agibetov and Matthias Samwald
Global and Local Evaluation of Link Prediction Tasks with Neural Embeddings

17:00 - 17:30 Muhammad Rahman and Tim Finin
Understanding and Representing the Semantics of Large Structured Documents

17:30 - 18:00 Szymon Wiczołek, Dominik Filipiak and Agata Filipowska
Semantic Image-Based Profiling of Users' Interests with Neural Networks
This paper has won the best paper award of SemDeep-4.