Learning Expressive Ontological Concept Descriptions via Neural Networks

Invited Talk by Marco Rospocher

1 Abstract

In this talk I will overview some recent work we have done on applying Neural Networks to learn expressive ontological concept descriptions from natural language text. The intuition behind the work is that the problem of encoding natural language definitions into Description Logics axioms can be framed as a syntactic transformation of the input sentence into a formula. We proposed two different approaches to implement this transformation. The first (presented in [1]) employs a process with two parallel phases (transduction & tagging). The second (submitted work, under review), tackles the problem as a neural machine translation task. Since no pre-existing dataset was available to adequately train Neural Networks for this task, we designed a data generation pipeline to produce datasets to train and evaluate the proposed architectures.

2 About the presenter

Dr. Marco Rospocher is a tenured research scientist at Fondazione Bruno Kessler (FBK)[1], within the Data and Knowledge Management (DKM) research unit[2]. He received his PhD in Information and Communication Technologies (ICT)[3] from the University of Trento in 2006. His current research interests are in the area of Artificial Intelligence, focusing in particular on ontologies, formalisms for Knowledge Representation and Reasoning, and methodologies and tools for Knowledge Acquisition and Information Extraction. He has been involved in a number of international research projects, including the EU-funded projects APOSDLE, PESCaDO, and NewsReader. He co-authored more than 80 scientific publications in international journals, conferences and workshops. He co-chaired the ACM SAC Cognitive Computing track (2017 and 2018) and Knowledge and Language track (forthcoming in 2019), the ISWC 2014 Posters and Demos track, and the AI*IA 2018 Doctoral Consortium. He regularly serves in the programme committees of relevant international conferences and workshops, and reviews submissions for top-ranked international journals.

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[1] https://www.fbk.eu/en/

[2] http://dkm.fbk.eu/

[3] https://www.fbk.eu/en/

References

1. Giulio Petrucci, Chiara Ghidini, and Marco Rospocher. Ontology learning in the deep. In *European Knowledge Acquisition Workshop*, pages 480–495. Springer, 2016.