

Introduction to the Second Workshop on Natural Language for Artificial Intelligence

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Natural Language Processing plays a fundamental role in current AI research, as target of different scientific and industrial interests. At the same time, several AI achievements have shown their beneficial impact on applications in linguistic modelling, processing and generation. Especially the recent advancements in deep learning are drastically changing the landscape of NLP, where the continuous performance improvement on well established tasks is happening at an unprecedented speed. Therefore, Natural Language Processing is — still and once again — a rich research topic, whose cross-fertilization with AI spans a number of independent areas such as Cognitive Computing, Robotics as well as Human-Computer Interaction. For AI, Natural Languages are the research focus of paradigms and applications but, at the same time, they act as cornerstones of automation, autonomy and learnability for most intelligent tasks. Such tasks range from Computer Vision, to Planning and Social Behavior analysis, up to more imponderable cognitive phenomena such as creativity and human emotions. A reflection about such diverse and promising interactions is an important target for current AI studies, fully in the core mission of AI*IA. Still, we also believe this area is not only “populated” of scientific and technological challenges. In fact, we trust that at the crossroad between NLP and AI, new technological paradigms rise: the resulting methodologies and technologies can change our reality and their societal impact has not yet been fully-fledged.

Given these premises, the goal of the workshop “Natural Language for Artificial Intelligence” (NL4AI) is to provide a meeting forum for stimulating and disseminating research where researchers (especially those affiliated with Italian institutions) can network and discuss their results in an informal way⁶. NL4AI-2018 was the 2nd edition of this workshop, taking place on November 22nd and 23rd in Trento, Italy. We thank the Italian Association of Computational Linguis-

⁶ <http://sag.art.uniroma2.it/NL4AI>

tics (AILC)⁷, that supported the invitation of three speakers to the workshop: Malvina Nissim, Giuseppe Attardi and Oliviero Stock.

The fourteen contributions to the workshop covered several of the aforementioned topics, even more than one at a time, showing the interdependencies among them. Here below we briefly review the contributions in light of such topics.

One of the first areas of interest that clearly emerged was related to human emotions, and in particular to **Affective Computing** with 5 papers devoted to the topic. Coman *et al.* focused on the use of Neural Networks for Emoji Prediction in Twitter, where the task is to predict the most salient Emoji to be associated to a text. Alqarafi *et al.* also focused on sentiment in Twitter, by describing a semi-Supervised methodology to build a corpus of annotated tweets in Saudi. De Mattei *et al.*, instead, focus on the relation between sentiment and irony in a Multi-Task Learning framework. Villaneau *et al.* focus on detection of aspects based sentiment analysis in French language, for the domain of Book Reviews where the aspects are less easy to characterize. Finally, Leggeri *et al.*, focus on the use of sentiment cues in Chatbot scenarios.

Other works are devoted to **knowledge extraction** from texts, in order to enable complex inference tasks. Two works specifically focus on *Named Entity Recognition*: Chen *et al.* focus on Transfer Learning for Named Entity Recognition in industrial settings, while Lauriola *et al.* focus on the Biomedical domain.

Some other work instead focused on representing several kinds of **ontological information**, and how to structure knowledge that can be extracted from a text. Gritz focuses on a new technique for improving lexicon-to-ontology mapping. Mondal focuses on the task of inferring Semantic Networks and meaning relations inside a lexicon. Basile *et al.* focus on mapping natural language terms to a Web knowledge base. They show that incorporating NLP elements such as terms' context and multi-word expressions treatment boost the performance. Finally, Braun *et al.* address the problem of automatically extracting relations between entities from online news and blog articles by using dependency parsing.

Finally, a set of works is focused on various **Natural language processing tasks** and complex inference tasks, ranging from *Question Answering* to *sentence simplification*. Gravina *et al.* focus on Answer Sentence Selection (ASS), one of the steps typically involved in Question Answering, using a Cross-Attentive Convolutional Neural Network. Schicchi *et al.*, instead focuses on a neural model for inducing the rules that identify the complexity of an Italian sentence, which is needed for deciding whether a sentence needs of simplification. Croce *et al.* focuses on a key topic in recent NLP approaches: the use of *embeddings*. In particular, the author focus on how to efficiently combine kernel methods and neural networks, to obtain unsupervised embeddings at the sentence level.

⁷ <http://www.ai-lc.it/>

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⁸ <http://aixia2018.fbk.eu/index.php/home/>