

Introduction to the First Workshop on Natural Language for Artificial Intelligence

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Natural Language Processing plays a relevant role in current AI research, as target of different scientific and industrial interests. At the same time, several recent AI achievements have shown their beneficial impact on applications in linguistic modelling, processing and generation. Therefore, Natural Language Processing is still 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. 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 way⁴. NL4AI-2017 was the 1st edition of this workshop, it took place on November 16th and 17th, at the Department of Computer Science of University of Bari, Italy. We acknowledge AILC, the Italian Association of Computational Linguistics, that supported the invitation of Carlo Strapparava who, as invited speaker to the workshop, gave the talk entitled “Computational explorations of creative language”.

The 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.

For example, the area of **creativity** - where cognition, knowledge representation and language collide - is addressed in Valitutti and Novielli, that focuses

⁴ <http://sag.art.uniroma2.it/NL4AI>

on the use of irony, or in Lombardo et al. that addresses the problem of dramatic texts annotation.

The area of **Human-Computer Interaction** - where user interaction, reasoning and language generation intersect - is covered by two papers. In Anselma and Mazzei reasoning and language generation are exploited for supporting users in their dietary choices, while Zanzotto et al. propose a framework for programming chatbots for communication experts and artists.

Other works are devoted to **knowledge extraction** from texts, in order to enable complex inference tasks. Montagnuolo et al. presents the results of the project “La Città Educante” (carried out by RAI) aiming at creating statistical models for automatic document categorization and named entity recognition, both acting in the educational field and in Italian language. At the same time, Lombardo et al. address the problem of metadata annotation - for dramatic texts. Metadata for drama describe the dramatic qualities of a text, connecting them with the linguistic expressions. Relying on an ontological representation of the dramatic qualities, the paper presents an annotation environment for the creation of a corpus of annotated texts.

The problem of representing **ontological information** is discussed in Bianchi and Polmonari where the authors focus on a method for representing entities and their types in a joint vector space for analogical reasoning. A shallower, more linguistic related information is presented in Valitutti and Novielli, to address the problem of recognizing irony and sarcasm in short texts. In particular it presents and evaluate two specific measures, i.e. polarity divergence and polarity dimorphism.

Other works investigate the relation between Natural language processing tasks and complex inference tasks, ranging from **Question Answering** to **Dialogue Management**. Madotto and Attardi address these tasks by exploiting a neural network architecture, which is a form of Memory Network, that recognizes entities and their relations to answers through a focus attention mechanism.

Moreover, the paper by Anselma and Mazzei describes a project involving **automatic reasoning** and natural language generation in the domain of diet management. The main issues related to the automatic reasoning mechanisms for diet management are reported and the message generation techniques, designed to support the users in managing their dietary choices, are presented.

Finally, Zanzotto et al. propose a framework to support the definition and implementation of **conversational agents**. This paper refers to a linguistic theory, i.e. Frame Semantics, to enhance the linguistic capability of conversational agents in a collaborative ecosystem.

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⁵ <http://aiia2017.di.uniba.it/index.php/organizers/>

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