Foreword

This volume contains the revised versions of the 8 regular, short and position papers presented at the First Workshop on: "Deep Understanding and Reasoning: A Challenge for Next-generation Intelligent Agents (URANIA)". The workshop was held in Genova, Italy, on the 28th of November 2016, in the context of the 15th International Conference of the Italian Association for Artificial Intelligence (AI*IA 2016).

The aim of the workshop was to bring together Artificial Intelligence (AI) researchers with complementary skills and background and to foster a discussion aimed at cross-fertilizing different AI sectors and to provide concrete means for autonomous reasoning agents design and evaluation. In a computer-aided problem solving process, there is always a substantial human intervention enabling the encoding of a problem in a machine-understandable model, which in turn can be solved automatically through a problem solving technique/algorithm. The human intervention is essential for identifying problem components, common-sense and hid-den knowledge in the problem description and to finally craft a computable model.

In a long-term vision, next-generation artificial intelligent systems and robots will be autonomous end-to-end solvers that perform the whole problem-solving process without any human intervention. Starting from a (possibly multi-modal) problem description, an end-to-end problem solver should automatically understand the problem, identify its components, devise a model, select a solving technique, and find a solution. Such autonomous intelligent agents should be pro-active and problem-solving driven; deep understanding and deep reasoning, not necessarily based on big-data, will be a crucial ingredient for their design.

In this context, it would be important to identify specific challenges, to assess the level of autonomy achieved, the effectiveness of end-to-end solvers, and to ease the dissemination of AI results to a general audience. This ambitious goal requires an unprecedented integration of AI areas and could represent an important step forward reducing the fragmentation of modern AI. Therefore, works and challenges presented at the workshop demand a combined effort of integration of different AI techniques such as Natural Language Processing, Machine Learning, Constraint-based reasoning, Logic and Automated Reasoning, Common-sense Reasoning, Human-Machine Interaction and Cognitive Science.

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Organization