Proposal for the 1st workshop on

ApplicatioNs of Semantic WEb technologies in Robotics

ANSWER 2017

ANSWER is a full-day workshop about the involvement of Semantic Web formalisms and technologies in robotic applications. This background will offer an opportunity to trigger and strengthen the dialogue between the Semantic Web and the Robotics communities. It will then give the opportunity of comparing and debating on problems that have been tackled so far by two communities that worked on such overlapping topics.

Overview

Robots are slowly spreading outside the industrial and research environment, to approach our everyday life. As this happens, robots will need to expose an increasing capability of dealing with different sources of knowledge about the world, for task such as Planning, Computer Vision, Natural Language Processing, Behaviour Analysis and Profiling. The need of integrating robots with Knowledge Bases to provide them with a basic understanding of semantics has been already considered by the Robotics community, and is testified by research projects such as KnowRob (http://knowrob.org/) and Robobrain (http://robobrain.me/). The increasing interest in the Semantic Robotics is underlined also the emergence of a number of upcoming workshops the like the First International Workshop on Semantic Robotics and the First International Workshop on Semantic Robots (see "Related Workshops" Section).

When semantics and knowledge representation come into play, it is normal to think whether and how Semantic Web technologies can have a role in this context. In the past year, the Semantic Web community have studied how to model, mine, manage and exploit knowledge from and for the Web, promoting in parallel the adoption of standards for knowledge representation. In this sense, we believe that Robotics is a key field of application for Semantic Web technologies, whose findings can be applied, adapted and further developed, as also shown by projects such as RoboEarth (http://roboearth.ethz.ch/).

It is therefore important to understand how the Semantic Web community is interfacing with the Robotics world, and whether it can actually be helpful. Although some effort has been put in bridging between Semantic Web and Robotics, a gap is still perceivable. With this workshop, we want to promote and strengthen the dialogue between the two (or more) communities that are working on such strictly connected topics, in order to find answers to the posed questions (and hopefully to ask new questions). Dialogue should then serve as a background in fostering, on one hand, the application of Semantic Web standards and techniques in problems common to Robotics, while on the other, in highlighting Robotics as a fertile application field for the Semantic Web community.

Audience

Given its inter-disciplinary nature (Semantic Web and Robotics), the workshop will not be appealing only for the usual ESWC audience, but it will also gather the attention of researchers from the Robotics community working on knowledge representation-

related problems, as well as people working in other research fields with major overlapping in both areas, e.g. Cognitive Science. Given such a broad coverage, we can roughly estimate to have 30-40 participants spanning across all the aforementioned communities.

Workshop Topics

ANSWER will look for original, high-quality contributions that embrace both the general topics of Semantic Web and Robotics, and explore (but will not limited to) the following more specialized topics:

- Application of Semantic Web standards for knowledge representation in Robotics
- Novel approaches enabling the use of Semantic Web technologies in Robotics
- Planning
- Semantic Maps
- Interlinking local robotic knowledge with information coming from the Web of Data/LOD
- Usability of available Semantic Web resources in Robotics
- Standardisation of terminology for robotics and automation using ontologies
- Knowledge sharing and exchange among several robotic platform or applications
- Position papers on present and future of semantic technologies in Robotics
- Representation and Reasoning for Robotics
- Knowledge acquisition in robotic applications
- Knowledge and perception
- Entity linking, grounding and anchoring
- IoT and Robotics
- Concrete use cases of working robotic systems exploiting Semantic Web approaches
- Semantic Web formalisms as a common format for integrating multi- and cross-domain sources of knowledge in robotic applications
- Human-robot and robot-robot interactions
- Cloud Robotics

Workshop Format

According to the size of the two (or possibly more) communities that the workshop is targeting, we believe that ANSWER should be organised as a full-day workshop, with two separate sessions, one in the morning and one in the afternoon. Each session will have presentations of peer-reviewed works and invited speakers. In order to guarantee a logical flow of the topics, works from the Robotics community will be presented in the morning session, while the afternoon session will be dedicated to the Semantic Web community. The format for the presented work will include full papers (10 pages in Springer LNCS typeset) on research and applied technologies having already reached a certain level of maturity, and short papers (5 pages) about early work, demos and positions on forthcoming challenges. The workshop will end with a final panel on the current status of the research, with a special focus on the possible implications in fostering the interaction between two communities, concluding with considerations about future challenges. A possible agenda is as follow:

Morning session	
1-2 invited talks (from Robotics)	30-40 minutes each

Peer-reviewed paper presentation (from Robotics)	~2 hours
Afternoon session	
1-2 invited talks (from Semantic Web)	30-40 minutes each
Peer-reviewed paper presentation (from Semantic Web)	~2 hours
Closing discussion and agenda for the next edition	30 minutes

Proposed timeline

Paper Submission deadline: Friday March 3, 2017
Reviewer assignment: Thursday, March 9, 2017
Reviews due: Friday, March 24, 2017
Notifications to authors: Friday, March 31, 2017
Camera-ready version: Thursday, April 13, 2017

Proposed Program Committee

Already confirmed members are in bold
Vaishak Belle, KU Leuven, Belgium
Fredrik Heintz, Linköping University, Sweden
Masoumeh Mansouri, Örebro University, Sweden
Andre Gaschler, Technische Universität München, Germany
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Sheila McIlraith, University of Toronto, Canada
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Enrico Daga, Open University, UK
Alessandro Russo, ISTC CNR, Italy
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Giovanni Pilato, Italian Research Council, Italy
Femke Ongenae, Ghent University, Belgium
Daniele Dell'Aglio, University of Zurich, Switzerland

Organising Committee

Emanuele Bastianelli (http://kmi.open.ac.uk/people/member/emanuele-bastianelli) is a Research Associate at the Knowledge Media Institute of the Open University. He has a Ph.D in Computer Science from the University of Rome, Tor Vergata, and has also worked as a research assistant at the Cognitive Cooperating Robots Lab (Lab.ro.co.co.) of Sapienza University of Rome. His research topics widely span from Urban Data Mining for Smart Cities to the general field of Human Robot Interaction, with a particular focus on the use of Spoken Language Understanding for robotic applications.

Mathieu d'Aquin (http://kmi.open.ac.uk/people/member/mathieu-daquin) is a Senior Research Fellow at the Knowledge Media Institute of the Open University. His current research focuses on building applications producing, consuming and reusing knowledge from Linked Data, particularly in the educational and Smart City domains. Besides publishing in major conferences and journals of the Semantic Web area, Mathieu has been recently organising events such as the Summer School on Ontology Engineering and the Semantic Web (SSSW), the LD4KD workshop, the Linked Learning workshop (2013, 2012, 2011), the Learning Analytics Data Challenge and the Using Linked Data in Learning Analytics tutorial.

Daniele Nardi (http://www.dis.uniroma1.it/~nardi/) is full Professor at Sapienza University of Rome, Facolta´ Ingegneria dell'Informazione, Informatica, Statistica, Dept. Computer, Control and Management Engineering "A. Ruberti". Recipient of "IJCAI-91 Publisher's Prize", prize "Intelligenza Artificiale 1993", ECCAI Fellow, Past President of the RoboCup Federation (2011-2014). Head of the research laboratory "Cognitive Cooperating Robots Lab" (Lab.ro.co.co), addressing different research topics: Cognitive Robotics, Cooperation in multi-robot systems, Human Robot Interaction, and several application domains, including Service Robots, Disaster Response Robots and Soccer Player robots for RoboCup competitions.

Related Workshops

IROS 2011 Workshop: Knowledge Representation for Autonomous Robots, co-located with IROS 2011 one of the first workshops fostering the use of semantics and knowledge representation in robotic applications.
(http://ias.cs.tum.edu/events/knowledge-workshop-iros2011)
Integrating Multiple Knowledge Representation and Reasoning Techniques in Robotics (MIRROR-16), co-located with IROS 2016, about the use and integration of different knowledge representations in robotic applications.
(http://aass.oru.se/Agora/MIRROR-2016/)
First International Workshop on Semantic Robotics (SR '17), co-located with ICSC 2017, whose aim is to show concrete solutions applying semantic techniques in robotics and automation, to facilitate high-level interfacing and to better support human-robot interaction. (http://wpage.unina.it/daniela.dauria4/icsc2017/)
The First International Workshop on Semantics for Engineering and Robotics (IWSER '17), co-located with ICSC 2017, aims at bringing together people from industry and academia to create an opportunity to discuss how Semantic Computing can be effectively applied for smart operation and application of robots. (http://conference-robotics.co.uk/)
First International Workshop on Semantic Robots (WSR '17), co-located with IEEE Robotic Computing 2017, about how Semantic Computing can be effectively applied for smart interactions between humans and robots for problem solving.
(http://icrc.asia.edu.tw/workshop-wsr2017/)