Preface

Natural language processing (NLP) has played an important role in several computer science areas, and requirements engineering (RE) is not an exception. For over twenty years, several works were published on the application of NLP techniques to address RE specific problems, such as traceability, categorisation, defect detection, model generation, and more. In recent years, the advent of massive and heterogeneous natural language (NL) RE-relevant sources, like tweets and app reviews, has sparked the interest of the RE community in NLP. Furthermore, we witness the novel golden age of NLP technologies, enabled by deep and shallow learning approaches that have improved the accuracy of most NLP tasks, including parsing and language translation. It is therefore an appropriate moment to create a venue in which researchers on applications of NLP to RE problems can meet, share ideas and create synergies, assisted by experts from the NLP community.

The current document is a preface to the proceedings of the 1st Workshop on Natural Language Processing for Requirements Engineering (NLP4RE’18, http://fmt.isti.cnr.it/nlp4re/), co-located with the 24th International Working Conference on Requirements Engineering: Foundation for Software Quality (REFSQ 2018) held in Utrecht, the Netherlands. The goal of NLP4RE’18 is to establish a meeting point for the researchers in the field to meet and discuss advances, challenges and barriers, and also to foster collaborations. The workshop features one keynote from Dan M. Berry, University of Waterloo on Evaluation of NLP Tools for Hairy RE Tasks. The keynote will illustrate, from an RE perspective, how to soundly assess the effectiveness of NLP tools in RE. Furthermore, NLP4RE’18 includes also an invited talk on Domain-adaptation of Natural Language Processing Tools for RE, from Tejaswini Deoskar, Institute for Logic, Language and Computation (ILLC), University of Amsterdam. This talk is given by a computational linguist who is an informed outsider about RE, and discusses solutions for one of the fundamental hurdles for NLP in RE: domain adaptation.

The workshop received 19 submissions. The papers were independently reviewed by three program committee members, and 11 papers were accepted by the co-organizers for presentation at the workshop. The authors of the remaining 8 papers were given the possibility to present a poster. This opportunity was accepted by the authors of 3 papers. Among these papers, 2 are presented also in the current proceedings as poster abstracts.

The papers and the posters can be grouped into four main groups: (1) technical papers discussing RE needs and associated NLP solutions; (2) report papers presenting past, ongoing and future work of research groups interested in NLP for RE; (3) vision papers discussing potential and intriguing research directions for the application of NLP technologies to RE problems; and (4) posters illustrating preliminary works. Below, we summarise the contributions within the different groups.

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1.1 Technical papers on RE Needs and NLP Solutions

Groen et al. [GSK+] focus on RE needs, and present a paper aimed at establishing whether NLP is actually necessary in RE. They investigate the problem of extracting requirements-relevant information from the large amounts of available online user feedback about software products such as apps, and they compare the amount of time required for conducting a manual versus automated analysis. They conclude that automated analysis is significantly faster, confirming the need for NLP in RE. Schlutter and Vogelsang [SV] focus on RE solutions instead, and they propose a method to ease requirements comprehension. The method collects disjoint requirements belonging to different components of a larger system, and automatically combines them into a single knowledge representation graph that relates the requirements. The coherent view on requirements concepts and relations provided by the graph can be used to support requirements comprehension and analysis.

1.2 Reports from Research Groups

Report papers from research groups, particularly encouraged by the call for papers of NLP4RE’18, form the large majority of the accepted contributions. Three reports come from within the RE research community [GF, BCFQ, FSM+], three reports belong to the artificial intelligence and NLP community [TH, BG, Tsa], and one report presents experiences from a company [Fem].

Gnesi and Ferrari [GF] present the past and current work of the FMT lab at CNR-ISTI on the usage of NLP for defect detection in requirements, support for product lines’ synthesis, and analysis of requirements elicitation interviews. Borull et al. [BCFQ] report on the ongoing work of the GESSI group at UPC within the context of the OpenReq EU project, focussing on the identification of similar requirements, to support inter-dependency detection, and reuse. Fucci et al. [FSM+] present the work of the MAST group at the University of Hamburg, mostly dedicated to the automated analysis of online user feedback and app reviews for the extraction of requirements-relevant information.

Tsarfaty [Tsa], from the NLP lab at the Open University of Israel, presents the work of the group performed in the context of the ERC-StG research grant named Natural Language Programming (NLPRO): Turning Texts into Executable Code. The project aims at developing a novel natural language compiler that takes a natural language description of a system as input, and returns as output the respective executable. Töws and Heuss [TH] report on the research done at Fraunhofer FKIE concerning requirements grouping by means of different similarity evaluation techniques. Bäumer and Geierhos [BG], from the department of Digital Humanities at the University of Paderborn, present the ongoing work of their group concerning the development of the CORDULA platform, oriented to recognise and automatically compensate language inaccuracies (e.g., ambiguity, vagueness and incompleteness) in requirements.

Femmer [Fem] presents the only company report at the workshop, which introduces the Qualicen Requirements Scout, a commercial tool for defect detection in requirements. The author illustrates the initial research performed at TUM that led to the development of the tool, and outlines research outcomes and industrial challenges from his perspective of tool provider.

1.3 Vision Papers

Garigliano et al. [GPM] present a vision paper that argues that NLP tools for general RE should be focused on a deep internal semantic representation of the text, which attempts to describe the text meaning in a form that can be different from the original one. This is expected to enable the extraction of implied information that is not explicitly given in the text. Friesen et al. [FBG], instead, present the idea of improving requirements quality by using chatbot technologies. Chatbots are expected to support the automatic compensation of some deficits in natural language requirement descriptions, by means of direct and guided interaction with the user.

1.4 Posters

Kifetew et al. [KPS] present a poster discussing the lessons learned in the SUPERSEDE EU project, aimed at processing user feedback to support software evolution. Specifically, the authors discuss issues related to the analysis of feedback that was made available in German, rather than English, and the consequent need for adaptation of available NLP approaches, mostly tailored for English. Caron et al. [CBG] present the idea for a system aimed at extracting information from requirements with a syntactic approach, and they outline the architecture for such system. Gori et al. [GOP+] presents an experiment that uses machine learning to detect
requirements defects, and they illustrate the encountered problems and challenges. This last poster does not appear in the current proceedings.

2 Program Committee

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- Daniel M. Berry, University of Waterloo, Canada
- Jörg Dörr, Fraunhofer IESE, Germany
- Henning Femmer, Technical University of Munich, Germany
- Davide Fucci, University of Hamburg, Germany
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- Norbert Seyff, University of Zurich and University of Applied Sciences and Arts Northwestern, Switzerland
- Michael Unterkalmsteiner, Blekinge Institute of Technology, Sweden
- Andreas Vogelsang, TU Berlin, Germany

References


[Fem] Henning Femmer. Requirements Quality Defect Detection with the Qualicen Requirements Scout.


