2nd Workshop on Natural Language Processing for Requirements Engineering (NLP4RE'19) and NLP Tool Showcase

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1 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 [Rya93], 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 machine translation. It is therefore an appropriate moment to organize events that enable researchers on applications of NLP to RE problems to meet, share ideas and create synergies, assisted by experts from the NLP community.

The current document is a preface to the proceedings of the 2nd Workshop on Natural Language Processing for Requirements Engineering (NLP4RE'19, `http://fmt.isti.cnr.it/nlp4re/`), co-located with the 25th International Working Conference on Requirements Engineering: Foundation for Software Quality (REFSQ 2019) held in Essen, Germany. After the first successful edition, whose results have been summarised in a recent IEEE Software paper [DFFP18], the goal of NLP4RE'19 is to strengthen its role as a meeting point for the researchers in the field, to foster collaborations, and to encourage synergies between industry, academia and vendors of NLP tools for RE. The workshop features one keynote from Vincenzo Gervasi (University of Pisa, Italy) on *Requirements Philology*. The keynote provides a viewpoint on adapting document-centered research methods typical of the Humanities and associated NLP techniques, to address specific requirements problems.

The workshop received 17 submissions. The papers were independently reviewed by three program committee members, and 12 papers were accepted by the co-organizers for presentation at the workshop, while 3 papers were accepted as posters.

The papers and the posters can be grouped into four main groups: (1) technical papers discussing RE needs and associated NLP solutions [TVH, ABNZ, SGVa, SGVb, FGS]; (2) report papers presenting past, ongoing and future work of research groups interested in NLP for RE [MLTvdA, VHP+, KPS, DB, BPE]; (3) tool demonstration papers [MBPM, GT]; and (4) posters illustrating preliminary works [DHGT, UY, cA].

NLP4RE'19 includes also a showcase of industrial NLP tools for RE organised by the Industry Track co-chairs of REFSQ'19: Sarah Gregory and Frank Houdek. During the showcase, different tool vendors provide demos of their tools to the attendees. Four companies are involved in the tool showcase:

- **Qualicen GmbH** (`https://www.qualicen.de/en/`), presenting Requirements Scout, a tool to analyze requirements specifications aiming to uncover requirements smells.
- **thingsThinking** (`https://www.thingsthinking.net/`), presenting Semantic processing platform, a tool to perform document comparison on a semantic level.
- **QRA** (`https://qracorp.com/`), presenting QVscribe, a tool for requirements analysis for quality and consistency.
- **OSSENO Software GmbH** (`https://www.osseno.com/en/`), presenting ReqSuite, a tool to support requirements writing and requirements analysis.

2 Program Committee

We warmly thank all the reviewers of our Program Committee (PC), who helped in the selection of the papers by providing timely and accurate reviews. The PC members of NLP4RE'19 are:

- Han van der Aa, Humboldt University of Berlin, Germany
- Frederik Simon Bäumer, Paderborn University, Germany
- Daniel M. Berry, University of Waterloo, Canada
- Felice Dell'Orletta, ILC-CNR, Italy
- Jörg Dörr, Fraunhofer IESE, Germany
- Henning Femmer, Technical University of Munich, Germany
- Davide Fucci, University of Hamburg, Germany
- Vincenzo Gervasi, University of Pisa, Italy
- Eduard Groen, Fraunhofer IESE, Germany
- Emitzá Guzmán, University of Zurich, Switzerland
- Anas Mahmoud, Louisiana State University, USA
- Daniel Méndez, Technical University of Munich, Germany
- Luisa Mich, University of Trento, Italy
- Itzel Morales Ramrez, Infotec, Mexico
- Barbara Paech, University of Heidelberg, Germany
- Anna Perini, FBK, Italy
- Mehrdad Sabetzadeh, University of Luxembourg, Luxembourg
- Nicolas Sannier, University of Luxembourg, Luxembourg
- Norbert Seyff, University of Zurich and University of Applied Sciences and Arts Northwestern, Switzerland
- Zahra Shakeri Hossein Abad, University of Calgary, Canada
- Daniel Töws, Fraunhofer FKIE, Germany
- Michael Unterkalmsteiner, Blekinge Institute of Technology, Sweden
- Andreas Vogelsang, TU Berlin, Germany
- Liping Zhao, University of Manchester, UK

References

[DFFP18] Fabiano Dalpiaz, Alessio Ferrari, Xavier Franch, and Cristina Palomares. Natural language processing for requirements engineering: The best is yet to come. *IEEE software*, 35(5):115–119, 2018.

[Rya93] Kevin Ryan. The Role of Natural Language in Requirements Engineering. In *Proceedings of the IEEE International Symposium on Requirements Engineering (ISRE)*, pages 240–242. IEEE, 1993.

Papers presented at NLP4RE'19

[ABNZ] Waad Alhoshan, Riza Batista-Navarro, and Liping Zhao. Using Frame Embeddings to Identify Semantically Related Software Requirements.

[BPE] Arianna Blasi, Alessandra Pezzè, Mauro Gorla, and Michael D. Ernst. Research on NLP for RE at Università della Svizzera italiana (USI): a Report.

[cA] Sercan. Çevikol and Fatma Başak Aydemir. Detecting Inconsistencies of Natural Language Requirements in Satellite Ground Segment Domain.

[DB] Fabiano Dalpiaz and Sjaak Brinkkemper. Research on NLP for RE at Utrecht University: a Report.

[DHGT] Michael Dembach, Hussein Hasso, Hanna Geppert, and Daniel Töws. Detection of Defective Requirements using Rule-based Scripts.

[FGS] Alessandro Fantechi, Stefania Gnesi, and Laura Semini. From Generic Requirements to Variability.

[GT] Stefania Gnesi and Gianluca Trentanni. QuARS: A NLP Tool for Requirements Analysis.

[KPS] Fitsum Meshesha Kifetew, Anna Perini, and Angelo Susi. Research on NLP for RE at the FBK-Software Engineering research line: a Report.

[MBPM] Quim Motger, Ricard Borrull, Cristina Palomares, and Jordi Marco. OpenReq-DD: A Requirements Dependency Detection Tool.

[MLTvdA] Jan Mendling, Henrik Leopold, Lucinéia Heloisa Thom, and Han van der Aa. Natural Language Processing with Process Models (NLP4RE Report Paper).

[SGVa] Rubens Santos, Eduard C. Groen, and Karina Villela. A Taxonomy for User Feedback Classifications.

[SGVb] Rubens Santos, Eduard C. Groen, and Karina Villela. An Overview of User Feedback Classification Approaches.

[TVH] Daniel Töws and Leif Van Holland. Determining Domain Specific Differences of Polysemic Words Using Context Information.

[UY] Michael Unterkalmsteiner and Andrew Yates. Expert-sourcing Domain-specific Knowledge: The Case of Synonym Validation.

[VHP+] Andreas Vogelsang, Kerstin Hartig, Florian Pudlitz, Aaron Schlutter, and Jonas Winkler. Supporting the Development of Cyber-Physical Systems with Natural Language Processing: a Report.