

Welcome to the First International Workshop on Requirements Engineering for Explainable Systems (RE4ES)

Wasja Brunotte*, Larissa Chazette*, Verena Klös†, Eric Knauss‡, Timo Speith§ and Andreas Vogelsang¶

* Leibniz University Hannover, Hannover, Germany

{larissa.chazette | wasja.brunotte}@inf.uni-hannover.de

† TU Berlin, Berlin, Germany

verena.kloes@tu-berlin.de

‡ Chalmers | University of Gothenburg, Gothenburg, Sweden

eric.knauss@cse.gu.se

§ Saarland University, Saarbrücken, Germany

timo.speith@uni-saarland.de

¶ University of Cologne, Cologne, Germany

vogelsang@cs.uni-koeln.de

Abstract—Welcome to the First International Workshop on Requirements Engineering for Explainable Systems (RE4ES), where we aim to advance requirements engineering (RE) for explainable systems, foster interdisciplinary exchange, and build a community. On the one hand, we believe that the methods and techniques of the RE community can add much value to explainability research. On the other hand, we have to ensure that we develop techniques fitted to the needs of other communities.

This first workshop explores synergies between the RE community and other communities already researching explainability. To this end, we have based our agenda on a mix of paper presentations from authors of different domains, one keynote from industry and one from research, as well as interactive activities to stimulate lively discussions.

Index Terms—Explainability, Explainability Requirements, Explainable Artificial Intelligence, XAI, Explainable Systems, Explainable Software, Requirements Engineering

I. MOTIVATION AND OBJECTIVES

A. Motivation

In our modern society, software systems are indispensable. They are highly integrated into our daily life and will continue to be so. However, the algorithms that underlie these systems have become more complex and opaque in their decisions, powered by the increasing popularity of machine learning approaches. Research in artificial intelligence (AI) advances the state of the art at great speed in search of higher degrees of system autonomy. With the number and impact of such systems rising, speaking about the features required to achieve high software quality standards is increasingly important.

Quality aspects such as ethics, fairness, and transparency have been discussed as essential for trustworthy AI. In this context, explainability has been identified as a means to achieve all of these three in systems. Additionally, it can also foster users' sentiments of trust in systems. Like other quality aspects, explainability must be discovered and treated during

the design of those systems [1]. As requirements engineers, we “translate” these aspects into requirements in a project context. As simple as it sounds, we know that reality proves to be otherwise. Quality requirements are often a challenge for practice, and explainability is no different [2].

Explainability has become a hot topic, and communities from different areas of knowledge (e.g., machine learning, human-computer interaction, philosophy, psychology, cyber-physical and recommender systems) have been researching it actively [3]. However, the requirements engineering (RE) research community seems to be less concerned with the issue. At the same time, our community is extremely rich in methods and techniques that facilitate software development. These techniques could add much value to explainability research.

B. Objectives

Based on this motivation, the workshop has three objectives:

a) *Advance RE4ES*: We foresee explainability as one of the key quality attributes of future software systems. This workshop shall foster research by offering a platform that attracts research and increases the topic's visibility. We hope to create momentum and provide opportunities to combine research and practice towards explainability.

b) *Interdisciplinary Exchange*: We have a vision of bringing researchers from different disciplines together to learn from them and propose solutions that fit the reality of research and practice. We are convinced that with the help of other research disciplines, we can significantly contribute to explainable systems and software.

c) *Community Building*: This workshop aims to establish and strengthen links in the community and foster communication between researchers working in the different fields that research on explainability. We can interactively compare the state of the art, understand research gaps, and inspire new work.

II. CONTRIBUTION TYPES AND PROGRAM

A. Contribution Types

Since explainability is a very new research area for requirements engineers, we asked for full-fledged research papers (up to 6 pages without references) and encouraged authors to submit shorter papers describing a problem or a vision (up to 4 pages without references). While the first type of contribution should already contain a proof-of-concept or a distinct vision of the research goal, the second type could outline rough but plausible visions for the future of explainability or (industrial) problem statements.

Each paper was reviewed by three Program Committee members, resulting in seven of eight received submissions being accepted for presentation at the workshop. Taking everything together, we are delighted with the quality of the workshop papers.

B. Program

Overall, the two-day workshop includes seven paper presentations, one industry keynote and one research keynote, and two break-out sessions to facilitate collaboration and discussions. Taken together, this results in seven sessions.

On the first day of the workshop, the paper presentations focus on global visions regarding explainability as well as interdisciplinary visions and approaches to explainable software systems, followed by an author panel. Afterwards, we have a break-out session to actively discuss *Open Research Questions and Takeaways*. We end the first workshop day with an industry keynote by Liu Ren¹, Ph.D., titled “Human-Assisted AI: A Visual Analytics Approach to Addressing Industrial AI Challenges”.

On the second day, we start with a research keynote by Markus Langer², Ph.D., titled “Psychological Dimensions of Explainability”. Subsequently, the paper presentations focus on explainability use-cases. The workshop concludes with an activity to develop a shared vision of a *Research Roadmap*. Based on the open research questions and takeaways identified during the first workshop day, this activity aims to top the workshop off and steer future explainability endeavors in RE.

III. ORGANIZATION

A. Organizing Committee

- Wasja Brunotte, Leibniz University Hannover, Germany
- Larissa Chazette, Leibniz University Hannover, Germany
- Verena Klös, TU Berlin, Germany
- Eric Knauss, Chalmers | University of Gothenburg, Sweden
- Timo Speith, Saarland University, Germany
- Andreas Vogelsang, University of Cologne, Germany

¹VP and Chief Scientist for integrated human-machine intelligence at the Bosch Research and Technology Center in North America

²Postdoctoral research associate at the Department of Work and Organizational Psychology at Saarland University

B. Program Committee

- Rasmus Adler, Fraunhofer IESE, Germany
- Rainara Maia Carvalho, Federal University of Ceará, Brazil
- Douglas Cirqueira, Dublin City University, Ireland
- Luiz Marcio Cysneiros, York University, Canada
- Joel Greenyer, FHDW Hannover, Germany
- Eduard C. Groen, Fraunhofer IESE, Germany
- Holger Hermanns, Saarland University, Germany
- Anne Hess, Fraunhofer IESE, Germany
- Jennifer Horkoff, Chalmers | University of Gothenburg, Sweden
- Lena Kästner, Saarland University, Germany
- Jil Klünder, Leibniz University Hannover, Germany
- Matthias Koch, Fraunhofer IESE, Germany
- Marco Konersmann, University of Koblenz and Landau, Germany
- Felix Lindner, University of Ulm, Germany
- Sven Peldszus, University of Koblenz and Landau, Germany
- Eva Schmidt, TU Dortmund, Germany
- Maike Schwammberger, University of Oldenburg, Germany

IV. CONCLUDING WORDS

Explainability is a very relevant topic at present, reflected in many topics of the leading conference. Be it stakeholders’ needs, societal challenges, or AI + RE: explainability plays a pivotal role for all of these topics. Additionally, explainability is in a transition phase into the industry, supporting its application potential in an increasing number of scenarios.

V. ACKNOWLEDGEMENTS

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