Preface: REFSQ 2025 Doctoral Symposium

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1. Introduction

REFSQ 2025 will host its renowned Doctoral Symposium (DS) for PhD students whose research relates to the field of Requirements Engineering (RE). The goals of the DS are:

- to provide PhD students with an opportunity to learn about the field and to get an understanding of what their colleagues are working on;
- to provide PhD students with a supportive and safe environment in which to present their plans and results;
- to provide all participating PhD students with feedback from a panel of senior researchers in RE;
- to facilitate interaction between students and established researchers in RE.

2. Submissions and Reviewing

We received three submissions that were reviewed and discussed by the chairs. This was based on relevance and suitability for the doctoral symposium and the REFSQ conference. This led to two contributions being accepted and one conditionally accepted. In the end, all three contributions were accepted.

3. Program

The doctoral symposium will start with a keynote presentation followed by a typical session in which the students present their papers, to then conclude with an in-depth discussion. In addition, the students prepare a poster that allows them to discuss their work with the participants of the conference. Furthermore, the organizers of the doctoral symposium prepare two seminars to which interested doctoral students are invited.

3.1. Session 1: Keynote

The keynote will be given by Prof. Dr. Fabiano Dalpiaz from the University of Utrecht. Dr. Dalpiaz's research blends artificial intelligence with information visualization to increase the quality of the requirements engineering process and artifacts. He devises software tools that assist human analysts and stakeholders in eliciting, expressing and analyzing requirements. Most of his research is validated empirically via experiments and/or collaboration with software companies.

Dr. Dalpiaz has served as program co-chair of IEEE RE 2023, REFSQ 2021, RCIS 2020. He was the organization chair for the REFSQ 2018 conference, and he is an associate editor for the Requirements Engineering Journal and the Business & Information Systems Engineering Journal, and he is on the steering committee of the REFSQ and the IEEE RE conferences. He regularly serves on the program committee of international conferences such as RE, CAiSE, AAMAS, REFSQ, ER, MODELS.

3.2. Session 2: Presentation of the three accepted papers

The second session will feature the presentation of the three accepted PhD student project proposals.

The paper **"Refactoring in Requirements Engineering: Exploring a methodology for formal verification of safety-critical systems"**, authored by Oisín Sheridan, presents a research plan to investigate consistency, readability and traceability of formal requirements. Often, dependencies and duplication of information between requirements emerge, which then requires additional work from engineers to update all of the affected requirements when changes need to be made. He proposes that this can be improved by applying refactoring to requirements. Refactoring is a software engineering technique where code is reorganized to improve its internal structure without changing its behavior; in the case of requirements, we can reduce duplication of information and improve readability of the requirements without changing the behavior that the requirements specify. His project aims to provide a working implementation of requirements refactoring in Mu-FRET, a fork of the Formal Requirements Elicitation Tool (FRET) which allows for requirements to be written in a structured natural-language, which is then translated automatically into temporal logic. In addition, he provides a theory of refactoring that can be generalized to other requirements languages.

The paper **"Actionable Open-source Intelligence Architecture for Cold Case Investigations"**, authored by Swikar Bhandari, presents a research plan to design a socio-technical system that facilitates the semi-automated collection and derivation of actionable intelligence from publicly available information for cold case investigations. The proposed system is designed using a multi-disciplinary approach by integrating solutions from the domains of homicide, ethics and philosophy, intelligence studies, and computer science. Additionally, existing requirement engineering literature was used to identify the requirements needed to design the proposed system.

The paper **"Combining (AI)-Tools and Human Tasks for RE: Towards a Process Framework"**, authored by Andrea Wohlgemuth, presents a research plan to investigate system and sub-system requirements that are processed at large-scale system providers with a mechatronic

and software scope. In this context, RE tasks must complement each other without losing information. RE process optimization in system contexts has been addressed for different large-scale systems, but the rapidly evolving automation possibilities for RE tasks come with a lack of guidance addressing the interplay of human and software-tool-executed tasks along system value chains. While RE process optimization and isolated tool setups have been evaluated in industry contexts, it lacks evaluation and RE guidelines on efficient combination of (AI-)tools and human tasks for RE (CombAIn4RE). Her research focuses on one intraLogistics Automation System (LAS) case company to explore, apply, and evaluate CombAIn4RE setups. She combines (1) empirical and (2) experimental methods to evaluate before-and-after status, explore and prioritize use cases, apply existing approaches, and validate applicability. She enriches the research with (3) methods to validate key results for generalizability to other LAS and system providers.

3.3. Session 3: Seminar on Mental Health in Academia

Title: Mental Health Awareness and Management: Engineering Academic Well-Being
Seminar leader: Lloyd Montgomery, University of Hamburg

Mental health issues such as anxiety and depression are prevalent within academics from BSc students to full professors. It is clear, however, that PhD students suffer the most given findings from mental health studies of academic institutions. The mental health difficulties experienced by all academics, however, is something Lloyd addresses using his 10+ years as an academic, mental health advocate, and someone who struggles with mental health issues. In this interactive talk/discussion, he will first outline some basics of mental health awareness at the level of the individual, including aspects such as failure, imposters syndrome, mental pain, isolation, competition, and the general feeling of being overwhelmed. He will then come to mental health management, and what we can do as individuals (as well as communities), to create a better future focused on mental well-being. This includes how to structure all aspects of your life within your Life Pillars, as well as how to approach your daily and weekly responsibilities through the management of your Life Resources. Throughout the talk, he will touch on aspects of managing your: life, schedule, data, projects, tasks, time, self-awareness, mental state, and more.

Lloyd Montgomery is a Software Engineering PhD Researcher at the University of Hamburg in Germany, working under Prof. Dr. Walid Maalej. He received his BSc and MSc from the University of Victoria, in BC Canada, working under Prof. Dr. Daniela Damian. While at the University of Victoria, he also studied other personal interests such as Philosophy, Psychology, and Sociology. Currently, his primary research area is the quality of requirements, with a special focus on issue tracking systems. Additional interests include machine learning, general applications of NLP in RE, user-centric design and innovation, customer support processes, and recommender systems. He won the RE'17 best paper award for his machine learning design science research with IBM customer support. Lloyd's academic service record includes serving as the RE'23 Publicity Chair, NLP4RE'22 Workshop Co-Chair, the RE'21 Artefact Co-Chair, a PC member for seven artefact tracks at RE, ICSE, and FSE, a PC member for NLP4RE and RE@Next! track, and he is currently the ISTJ Publicity Co-Chair. Lloyd also enjoys activities outside work, including playing squash, billiards, video games, and piano, as well as learning German. For his

community, Lloyd enjoys communicating and educating about science and mental health. He was the Director of Pint of Science Germany for four years, a volunteer-based non-profit that delivers science talks in 24+ German cities every year. He has also given talks on mental health, including in Sweden at the Blekinge Institute of Technology and Humboldt University of Berlin.

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