HOFM 2015 Summary

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Abstract. The aim of Human-Oriented Formal Methods (HOFM) workshop series is to bring together researchers and practitioners from academia and industry to exchange ideas and experience in the field of application of human factors to the analysis and to the optimisation of formal methods, as well as to present ongoing research and emerging results in this field. HOFM also aims to develop a future vision and roadmap of usability and automation of formal methods, focusing especially on readability and ease of use.

1 Motivation

The second Human-Oriented Formal Methods (HOFM) workshop was held on 7 September 2014 in York, UK. This international workshop was affiliated to the 13th International Conference on Software Engineering and Formal Methods (SEFM 2015). The aim of HOFM workshop series is to establish a community that will investigate the field of application of human factors to the analysis and to the optimisation of formal methods. Formal methods (FMs) have been successfully applied in software engineering research for several decades. However, many software engineers largely reject FMs as “too hard to understand and use in practice” while admitting that they are powerful and precise. The reason for this rejection is the lack of usability features: If usability is compromised, methods cannot fit in a real software development process.

There are many applications of FMs to analyse human-machine interaction and to construct user interfaces. However, the field of application of human factors to the analysis and to the optimisation of FMs in the sense of usability, is almost unexplored. The first and the second iteration of the workshop showed that there is interest in collaborations and discussions on this topics, and that there are currently more questions than answers in this field. Bad design of interfaces and languages can induce unnecessary human error, cf. e.g., [7], however, the error information can be used to improve quality of software and the corresponding development artefacts, also including FMs [1, 2, 8, 5]. “Formal” does not mean “unreadable”, but the readability and usability of FMs might be increased by analysing human factors related to the specification, modelling and verification [4].
2 Workshop Contributions

HOFM 2015 received submissions from 15 authors, affiliated with universities and industry from UK, Germany, Israel, Norway, Australia, the Netherlands and Tunis. Every submitted paper was reviewed by at least three Program Committee members, 5 regular papers were accepted for presentation at HOFM 2015.

The HOFM 2015 pre-proceedings, which include all papers presented at the workshop, are available online at the workshop site [3]. All authors of the HOFM workshop were invited to submit extended versions of their peer-reviewed papers to the post-proceedings, taking into account feedback from the HOFM reviewers as well as discussions made during the workshop.

An introduction to the second HOFM workshop was given by the keynote talk Beating error with formal methods, given by Harold Thimbleby, Swansea University, Wales, UK. In this presentation, Thimbleby emphasised that FMs provide another point of view, namely mathematical reasoning, on software engineering problems, and this special point of view can help to identify issues that normal human thinking misses. This introduction lead the workshop discussion to the point that FMs are a very important for software engineering, especially for the field of safety-critical systems, but the understandability and readability as well as fear of mathematics and logic might become obstacles for broad application of FMs.

The workshop was concluded by an open discussion on the topics of the regular paper talks and the keynote talk as well as on the route map for the research within human factors in formal methods.

3 Discussion

The goal of the open discussion was to stimulate collaboration between researchers and to develop a future vision and roadmap of usability, automation and other human-oriented aspects of FMs, focusing especially on readability and understandability.

The main focus of the discussion was on teaching of FMs and the human factors that are related to this learning and teaching activity. Workshop presenters and participants agreed that in order to make progress towards popularisation of FMs in industry, we have to work on popularisation of FMs as a part of the university curriculum, also taking into account different backgrounds and aims of the students.

The discussion further focused on the following questions:

– How can we influence on readability, understandability, and perception of FMs?
– How can we deal with collaborative aspects of specification & verification?
– How can we contribute to the sustainability of the FMs (and through FMs)?

One of the early results of this discussion is the paper [6], accepted to the International Workshop on Automated Testing of Cyber-Physical Systems in the Cloud.
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References