First International Workshop on Human Factors in Modeling (HuFaMo 2015)
Preface

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I. Introduction

Modeling is a human-intensive enterprise. As such, many research questions related to modeling can only be answered by empirical studies employing human factors. The International Workshop Series on **Hu**man **Fa**ctors in **Mo**deling (**HuFaMo**) is dedicated to the discussion of empirical research involving human factors in modeling. Our goal is to improve the state of the science and professionalism in empirical research in the Model Based Engineering community. Typical examples of research questions might consider the usability of a certain approach, such as a method or language, or the emotional states or personal judgements of modelers.

While concerned with foundations and framework support for modeling, the community has been somehow neglecting the issue of human factors in this context. There is a growing need from the community concerned with quality factors to understand the best practices and systematic approaches to assert usability in modeling and confirm the claims of productivity. This workshop creates a space for discussion being a get together of both MDE, Usability, Human Interfaces and the Experimental Software engineering community.

HuFaMo expressly focuses on human factors, in order to raise the awareness for these topics and the associated research methods and questions in the modeling community, providing an outlet for research of this type, guaranteeing high quality reviews by people that apply these research methods themselves. Along with fully complete empirical evaluations, the workshop organizers explicitly encouraged researchers new to empirical methods to discuss study designs before conducting their empirical evaluations. The rationale was to create a constructive environment where the HuFaMo participants could contribute to improving the proposed study designs so that stronger (and more easily replicable) empirical designs and results can be obtained. Ultimately, we aim to congregate a community of researchers and practitioners that promotes (possibly independently replicated) empirical assessments on claims related to human factors in modeling.

II. The first edition of HuFaMo

The first edition of this workshop series (HuFaMo 2015) took place in Ottawa, Canada, in September 28, 2015. HuFaMo 2015 was integrated in the ACM/IEEE 18th International Conference on Model Driven Engineering Languages and Systems, the premier conference on systems and software modeling. In this first edition, HuFaMo attracted a considerable number of participants, including researchers and practitioners. There were 24 participants, from 14 countries.

The workshop included the discussion of 6 position papers and a working session on how to build up the HuFaMo community and leverage the synergies among participants.

III. Formal paper presentations

The HuFaMo Program Committee selected 6 papers for presentation in the workshop. Here, we briefly outline some of the main contributions of each of those papers.

One of the important characteristics of modeling is that, in general, it is a collaborative endeavor which may involve stakeholders with different profiles. Empowering those stakeholders is, naturally, a key element for modeling success. Betty Cheng presented work on how to empower visually impaired persons (VIPs) in modeling activities, so they can more actively collaborate with other modelers [1]. She described the PRISCA project, which aims to facilitate this collaboration by generating a haptic 3D representation from a UML model while textual elements in the model are converted to Braille. A key human factor addressed by this work is how to effectively communicate model information with VIPs (and, more generally, with people with other disabilities), so they can more easily create a mental model of the models, facilitating their active participation in the MDE process. The early results of this project, which provides an new interaction mode with modeling point to an improved model comprehension experience by VIPs.

The usage of different modes of interaction with modeling tools is an important part of the holistic approach to support modeling and design activities, argued by Michel Chaudron, while presenting his teams vision of what a new generation of software design environments should be like [2]. Indeed, recent hardware improvements make feasible the introduction of new interaction modes (e.g. voice, touch, eye focus, etc.) that can significantly enhance the user experience of the modelers. Software designers often collaborate using flexible media, such as a whiteboard, to sketch models, perhaps using a combination of different notations, including informal ones. These collaborations and interactions include verbal discussions, which could be recorded and associated with the produced artifacts.

To support this vision, it is essential to integrate the artifacts produced with different modes, notations, tools and platforms, so that they can potentially be transformed, reorganized and even transferred to subsequent processing tasks. For example, a hand-drawn class diagram can be transformed to a formal class diagram, and the audio of the discussion held while designing this diagram could be associated to the formal diagram, to provide traceability for the design rationale. The class diagram could then be used as a source for generating an implementation, and all this could be done while preserving traceability links to the original artifacts.

Selecting the most adequate modeling language for a given purpose is essential to increase the productivity of the people involved in modeling. Grischa Liebel presented a controlled experiment, performed with undergraduate students, comparing two alternative behavioral requirements modeling languages in terms of the comprehensibility of functional requirements they support [3]. The two languages, Modal Sequence Diagrams and Timed Automata provided a similar level of comprehensibility, although the subjects using Modal Sequence Diagrams answered significantly more questions than those than those using Timed Automata. As such, if speed or efficiency are a priority, Modal Sequence Diagrams may be more adequate than Timed Automata. This is yet to be confirmed with more experienced modelers, as different profiles may lead to significantly different results.

Acknowledging the relevance of using the most adequate formalism for a given activity in software development may sometimes lead to the identification of the need for a new language, particularly if there is a perception that the current baseline solution introduces unnecessary accidental complexity. An instance of this scenario can be found in the construction of the Hasselt domain-specific language, which combines textual and visual models, and was created to facilitate the implementation of multimodal systems. Fredy Cuenca discussed an experiment to compare Hasselt with the baseline solution (implementations in C#, in this case) [4]. Although the differences of the collected completion times were not statistically significant, the subjective evaluation of participants shows they saw value in the proposed models (in Hasselt).

In order to really benefit from modeling activities, it is important to provide modelers with adequate tool support. Victor Guana presented an empirical study design aimed at evaluating developer performance, in terms of time and precision, while using two different approaches (classical integrated development environment vs. specialized traceability visualizations for model transformation compositions) [5]. The planned experiment aims at two research questions: how developers answer questions involving the discovery, filtering and summarization of artifacts that constitute a model-based code generator, and whether they can perform these activities with a better performance using tool supported interactive traceability visualizations.

Ultimately, the practitioners perception on the value of modeling is a key element for its successful adoption in industry. Badreddin et al. performed a survey with undergraduate and graduate students from 3 universities, in Canada, Israel and the United States of America, to assess their perception of the value of modeling as they progress in their studies [6]. Students perception on the value of modeling decreases, as they progress within their degree. In spite of this, graduate students do have a more favorable opinion of modeling than undergraduates, especially for communication, documentation, as well as tool availability and readiness. This more favorable perception by graduate students to the different kind of modeling tasks they typically perform, which may be more suitable to modeling approaches. In any case, the authors suggest further exploring these perceptions, as this will provide insights that could be valuable in reshaping the way modeling is taught.

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ORGANIZERS

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