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Jonathan P. Bowen · Huibiao Zhu (Eds.)

Unifying Theories of Programming

6th International Symposium, UTP 2016
Reykjavik, Iceland, June 4–5, 2016
Revised Selected Papers

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Preface

Interest in the fundamental problem of the combination of formal notations and theories of programming has grown consistently in recent decades. The theories define, in various different ways, many common notions, such as abstraction, refinement, choice, termination, feasibility, locality, concurrency, and communication. Despite these differences, such theories may be unified in a way that greatly facilitates their study and comparison. Moreover, such a unification offers a means of combining different languages describing various facets and artifacts of software development in a seamless and logically consistent manner.

C.A.R. Hoare and Jifeng He's *Unifying Theories of Programming* (UTP) is widely acknowledged as one of the most significant such unification approaches. Based on their pioneering work, the aims of the UTP Symposium series are to reaffirm the significance of ongoing UTP research efforts and to stimulate advancement of the state of the art in the field. The symposium provides a focus for the sharing of results by those already actively contributing, as well as raising awareness of the benefits of such unifying theoretical frameworks among the wider computer science and software engineering communities.

The UTP 2016 Symposium was held over two days (June 4–5, 2016) in conjunction with the Integrated Formal Methods (iFM) 2016 Conference in the capital city of Reykjavik, Iceland, on the campus of Reykjavik University. The iFM 2016 general chair, Marjan Sirjani, and the workshop chair, Marcel Kyas, both of Reykjavik University, were especially helpful in the organization of the UTP Symposium.

UTP 2016 was co-sponsored by Reykjavik University itself and also East China Normal University. It was the sixth symposium in the UTP series. Previous, UTP symposia have been held successfully every two years in Durham, UK (2006), Dublin, Republic of Ireland (2008), Shanghai, China (2010), Paris, France (2012), and Singapore (2014).

A pleasing feature of the UTP 2016 Symposium was the presence for the first time of both of the founding fathers of UTP, Prof. Sir Tony Hoare (Microsoft Research Laboratory, Cambridge, UK) and Prof. Jifeng He (East China Normal University, Shanghai, China). They previously worked together at the Programming Research Group within the Oxford University Computing Laboratory in the UK, where they developed their ideas that led to their co-authored foundational book on UTP, published in 1998. Both gave keynote talks that added considerably to the UTP 2016 program.

In addition, a panel discussion chaired by Prof. Jonathan Bowen on "UTP Past, Present and Future Directions" was held at the end of the first day, with contributions by panelists Tony Hoare, Andrew Butterfield (Trinity College Dublin, Republic of Ireland), Ana Cavalcanti, and Jim Woodcock (both of University of York, UK). The panelists discussed how they first became involved and interested in UTP, gave an overview of their current work in UTP, and provided their thoughts on where they saw

UTP going in the future. Later, Andrew Butterfield delivered an entertaining and apposite after-dinner speech at the symposium dinner, held in a historic building at a lakeside location in central Reykjavik.

As well as the keynote talks and panel discussion, eight peer-reviewed papers were presented at the UTP 2016 Symposium. Drafts of the papers were given to symposium attendees on USB sticks and revised version of the papers are included in these proceedings.

In summary, we hope that you enjoy this volume, providing a selection of recent research developments and perspectives in the area of Unifying Theories of Programming (UTP). Further information related to the UTP 2016 Symposium can be found online under: http://utp2016.ecnu.edu.cn

November 2016

Jonathan P. Bowen
Huibiao Zhu

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