

Joachim Hertzberg
Michael Beetz
Roman Englert (Eds.)

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Preface

The 30th Annual German Conference on Artificial Intelligence (KI-2007) took place in the University of Osnabrück, September 10–13, 2007. In this volume, you will find papers or abstracts of its six invited talks, 25 full papers, and 21 posters. The full papers were selected from 81 submissions, resulting in an acceptance rate of 32%.

As usual at a KI conference, an entire day was reserved for targeted workshops – ten of them this year – and two tutorials. They are not covered in this volume, but the conference Web site www.ki2007.uos.de will keep providing information and references to their contents. Some topic clusters are apparent in the overall conference program, which reflect recent trends in AI research, convolved with foci of work in Germany and Europe. Examples are learning and data mining, robotics and perception, knowledge representation and reasoning, planning and search – all of them including a healthy number of approaches dealing with uncertainty, contradiction, and incompleteness of knowledge. All in all, KI-2007 provided a cross section of modern AI research and application work.

KI-2007 also constituted a “small anniversary,” being the 30th exemplar of its kind. The invited talk by Wolfgang Bibel (accompanied by a paper in this volume) picked up on that occasion by recalling what the field of automated deduction was like 30 and more years ago – in general, and in Germany. He also paid homage to Gerd Veenker, who organized the first KI conference (which had a different name at the time) in 1975 and whose field of research was deduction. We were very happy that Wolfgang Bibel accepted our invitation to give this type of talk, as AI – developing swiftly as it does – is in permanent danger of forgetting its earlier days and the lessons that can be learned from them.

Our thanks and gratitude, first and foremost, go to the colleagues who accepted our invitations or submitted workshop proposals and papers and posters and all sorts of input: Imagine you organize a conference, and no one responds – we thank all of them that this was definitely not the case! Next, we thank all those who helped organize KI-2007 and who are listed on the next few pages. Part of the organization was, of course, handling the submissions and the reviewing. In that respect, the EasyChair conference system was of enormous help, and we would like to thank its main developer Andrei Voronkov for not only developing it, but also providing it for free to the scientific community. And finally, we thank the responsible and sponsoring institutions of this conference, also listed in the following pages: Without their support, a KI conference might have been possible, in principle, but it would have been much more stressful, much less successful and much less enjoyable!

July 2007

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The Role of AI in Shaping Smart Services and Smart Systems

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Services and Systems must include a set of features to remain competent and future conform: intelligent behaviour, personalisation, adaptivity, scalability, manageability, ease of use and user friendliness, security, and self-healing capabilities. As a consequence, new architectural models are needed, which provide the users with access to a cognitive behaviour aspect of the system, and which may draw inspiration from the brain sciences. On the other hand, we have to use knowledge representation and semantic modeling, e.g., ontologies for representing our environment or basic properties of services and systems. This would naturally involve Agent Technology, AI, and Software Technology. So, approaches from many different disciplines have to work in integration.

Integrated frameworks handling such different aspects are called “Service-ware Frameworks”. They contain a scalable Service Architecture, which facilitates merging different selected features into a service, as well as a scalable so-called Service Engine with a Serviceware Infrastructure. For creating Smart Services and Smart Systems, we use engineering approaches that include innovative service description languages and tools. In this presentation, a framework with the properties and features just described will be presented. A sample application developed with this framework will also be presented: the “Smart Energy Assistant”.

Early History and Perspectives of Automated Deduction

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Abstract. With this talk we want to pay tribute to the late Professor Gerd Veenker who deserves the historic credit of initiating the formation of the German AI community. We present a summary of his scientific contributions in the context of the early approaches to theorem proving and, against this background, we point out future perspectives of Automated Deduction.

Formal logic is still often looked upon as a kind of esoteric doctrine.

Evert W. Beth 1958

The fundamental scientific progress lies in the area of logic and the cognitive sciences.

Pierre Papon 2006

1 Introduction

Gerd Veenker is known in the German Artificial Intelligence (AI) community for his initiative and organisation of the first national AI meeting in Bonn in 1975 and the second one in Dortmund in the same year. This year we celebrate the thirtieth German AI conference and for this reason commemorate of him and of his work. Had he not died so prematurely we could as well have celebrated his seventieth birthday.

Veenker's scientific contributions are in the field of Automated Deduction (AD). In fact, he was the very first German scientist who contributed to this fruitful and still promising field. In the mid-sixties of the last century with his theoretical work and his working systems he was at the forefront of AD internationally. For instance, his system NEU of 1966 realized what only a decade later was reinvented and called UR-resolution (for Unit Resulting). Unfortunately, he was totally isolated in those days when Informatics did not yet exist in Germany, let alone an "esoteric doctrine" like computational logic [Bet58, p.50]. So his contributions have stayed totally unnoticed.

As a courageous pioneer he deserves to be commemorated. We therefore summarize in Section 4 of this paper some of his early contributions. Because these cannot be appreciated without some knowledge about the state of the art in