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ZB 2003: Formal Specification and Development in Z and B

Third International Conference of B and Z Users
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Preface

These proceedings record the papers presented at the third International Conference of B and Z Users (ZB 2003), held in the city of Turku in the south of Finland. This conference builds on the success of the first and second conferences in this series, ZB 2000, held at the University of York in the UK and ZB 2002, held at the *Laboratoire Logiciels Systèmes Réseaux* within the *Institut d'Informatique et Mathématiques Appliquées de Grenoble* (LSR-IMAG) in Grenoble, France. The location of ZB 2003 in Turku reflects the important work in the area of formal methods carried out at Åbo Akademi University and the Turku Centre for Computer Science (TUCS), especially involving the B method. In particular, Ralph-Johan Back, Professor of Computer Science at Åbo Akademi University and an Academy Professor at the Academy of Finland, has made an important contribution to the development of refinement calculus, influential and relevant to many formal methods, including B and Z. He was an invited speaker at the previous ZB 2002 conference.

B and Z are two important formal methods that share a common conceptual origin; they are leading approaches in industry and academia for the specification and development (using formal refinement) of computer-based systems. At ZB 2003 the B and Z communities met once again to hold a third joint conference that simultaneously incorporated the 14th International Z User Meeting and the 5th International Conference on the B method. Although organized logistically as an integral event, editorial control of the joint conference remained vested in two separate but cooperating program committees that respectively determined its B and Z content, but in a coordinated manner.

All the papers in these proceedings have been peer reviewed by at least three reviewers drawn from the B or Z committee depending on the subject matter of the paper. Reviewing and initial selection were undertaken electronically. The Z committee met at South Bank University in London on 4th February 2003 to determine the final selection of Z papers. The B committee met on 5th February 2003 at the *Conservatoire National des Arts et Métiers* (CNAM) in Paris to select B papers. A joint committee meeting was held at South Bank University on 6th February 2003 to resolve the final paper selection and a draft program for the conference.

The conference featured a range of contributions by distinguished invited speakers drawn from both industry and academia. The invited speakers addressed significant recent industrial applications of formal methods, as well as important academic advances serving to enhance their potency and widen their applicability. Our invited speakers for ZB 2003 were drawn from France, Switzerland, and the USA.

Jean-Raymond Abrial, a consultant based in Marseille, France, was the progenitor of both Z and B. It was a great delight to have him as an invited speaker at ZB 2003 where he delivered a lecture sponsored by Formal Methods Europe (FME). Prof. Dr. Bertrand Meyer is Chair of Software Engineering in the Department of Computer Science at the world renowned ETH, the Swiss Federal Institute of Technology in Zürich, Switzerland. He has undertaken important work in the area of object-oriented software technology and continues in the footsteps of the great computing pioneer, Niklaus Wirth, who was

based at the same institution, and designed Pascal, Modula-2, and other programming languages. Daniel Jackson is the Ross Career Development Professor of Software Technology in the Department of Electrical Engineering and Computer Science at MIT, USA. He leads the Software Design Group in the Laboratory for Computer Science and is the son of Michael Jackson, the originator of JSP and JSD, making him one of a handful of second generation computer scientists. He has developed Alloy, a lightweight modeling language based on a subset of the Z notation, and the Alloy Analyzer, a tool for automatically analyzing models.

Besides its formal sessions the conference included tool demonstrations, exhibitions, and tutorials. In particular, a workshop on *Refinement of Critical Systems: Methods, Tools, and Experience* (RCS 2003) was organized on 3rd June 2003 with the support of members of the EU IST-RTD Project *MATISSE: Methodologies and Associated Technologies for Industrial Strength Systems Engineering*, in association with the ZB 2003 meeting. In addition, the International B Conference Steering Committee (APCB) and the Z User Group (ZUG) used the conference as a convenient venue for open meetings intended for those interested in the B and Z communities respectively.

The topics of interest to the conference included: industrial applications and case studies using Z or B; integration of model-based specification methods in the software development lifecycle; derivation of hardware-software architecture from model-based specifications; expressing and validating requirements through formal models; theoretical issues in formal development (e.g., issues in refinement, proof process, or proof validation, etc.); software testing versus proof-oriented development; tools supporting tools for the Z notation and the B method; development by composition of specifications; validation of assembly of COTS by model-based specification methods; Z and B extensions and/or standardization.

The ZB 2003 conference was jointly initiated by the Z User Group (ZUG) and the International B Conference Steering Committee (APCB). Åbo Akademi and the Turku Centre for Computer Science (TUCS) provided all the local organization and financial backing for the conference. Without the great support from local staff at Åbo Akademi and TUCS, ZB 2003 would not have been possible. Particular mention should be made of the Local Committee Chair, Marina Waldén. ZB 2003 was sponsored by ClearSy System Engineering, Nokia, BCS-FACS (the British Computer Society Formal Aspects of Computing Science specialist group), FME (Formal Methods Europe), and ZUG (Z User Group). BCS-FACS specifically sponsored prizes for the best papers at the conference. We are grateful to all those who contributed to the success of the conference. ZUG sponsored students to attend the conference.

Online information concerning the conference is available under the following Uniform Resource Locator (URL):

`http://www.tucs.fi/zb2003/`

This also provides links to further online resources concerning the B method and Z notation.

We hope that all participants and other interested readers benefit scientifically from these proceedings and also find them stimulating in the process.

March 2003

Didier Bert
Jonathan Bowen
Steve King
Marina Waldén

Program and Organizing Committees

The following people were members of the ZB 2003 Z program committee and reviewed papers for the conference:

Conference Chair: Jonathan Bowen, South Bank University, London, UK
Program Chair: Steve King, University of York, UK

Rob Arthan, Lemma 1, Reading, UK
Neville Dean, Anglia Polytechnic University, UK
John Derrick, The University of Kent at Canterbury, UK
Mark d'Inverno, University of Westminster, UK
Wolfgang Grieskamp, Microsoft Research, USA
Henri Habrias, University of Nantes, France
Ian Hayes, University of Queensland, Australia
Martin Henson, University of Essex, UK
Jonathan Jacky, University of Washington, USA
Kevin Lano, Kings College London, UK
Yves Ledru, LSR-IMAG, Grenoble, France
Fiona Polack, University of York, UK
Norah Power, University of Limerick, Ireland
Steve Reeves, University of Waikato, New Zealand
Mark Saaltink, ORA, Ottawa, Canada
Thomas Santen, Technical University of Berlin, Germany
Graeme Smith, University of Queensland, Australia
Susan Stepney, University of York, UK
Ian Toyn, University of York, UK
Mark Utting, University of Waikato, New Zealand
Sam Valentine, LiveDevices, UK
John Wordsworth, University of Exeter, UK

The following served on the ZB 2003 B program committee and reviewed papers for the conference:

Program Chair: Didier Bert, CNRS, LSR-IMAG, Grenoble, France
Co-chair: Marina Waldén, Åbo Akademi University, Finland

Christian Attiogbé, University of Nantes, France
Richard Banach, University of Manchester, UK
Juan Bicarregui, CLRC, Oxfordshire, UK
Egon Börger, University of Pisa, Italy
Michael Butler, University of Southampton, UK
Lilian Burdy, GemPlus Research Laboratory, France
Dominique Cansell, LORIA, University of Metz, France
Pierre Chartier, RATP, Paris, France
Steve Dunne, University of Teesside, UK
Mamoun Filali, CNRS, IRIT, Toulouse, France
Marc Frappier, University of Sherbrooke, Canada
Andy Galloway, University of York, UK
Jacques Julliand, University of Franche-Comté, Besançon, France
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Ken Robinson, The University of New South Wales, Australia
Emil Sekerinski, McMaster University, Canada
Bill Stoddart, University of Teesside, UK
Helen Treharne, Royal Holloway, UK
Véronique Viguié Donzeau-Gouge, CNAM, Paris, France

The following people helped particularly with the organization of the conference in various capacities:

Conference Chair:	Jonathan Bowen, South Bank University
Local Committee Chair:	Marina Waldén, Åbo Akademi University
B submissions:	Didier Bert, LSR-IMAG, Grenoble
Z submissions:	Steve King, University of York
Tools demonstrations & exhibitions:	Kevin Lano, King's College London Ulf Tigerstedt, Åbo Akademi University

Tutorials:	Henri Habrias, University of Nantes
Proceedings:	Didier Bert, LSR-IMAG, Grenoble
Grants:	Steve King, University of York
Local arrangements:	Orieta Celiku, Åbo Akademi University
Finances:	Anna Karlsson, Åbo Akademi University
Website:	Nina Kivinen, Åbo Akademi University

We are especially grateful to the above for their efforts in ensuring the success of the conference.

External Referees

We are grateful to the following people who aided the program committees in the reviewing of papers, providing additional specialist expertise:

Pascal André, University of Yamoussoukro, Ivory Coast
Diyaa-Addein Atiya, University of York, UK
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