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ZUM '95: The Z Formal Specification Notation

9th International Conference of Z Users
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Proceedings

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Preface

For ZUM'95, the 9th in the series, we are pleased to report that we received more than twice as many submissions as any previous Z User Meeting. The past four Z User Meeting proceedings have been published in the Springer-Verlag *Workshops in Computing* series. This year the event has been renamed the *International Conference of Z Users*, being the first in the series to be held outside the United Kingdom, although we are retaining the acronym 'ZUM'. Partly as a result of the change of name, the proceedings is now published in the Springer-Verlag *Lecture Notes in Computer Science* series instead.

The activities associated with the meeting span a whole week. The wide selection of tutorials offered for the three days immediately preceding the main meeting, organized by Norah Power, are intended to provide attendees with the opportunity to gain a grounding in the topics covered. On the day before the meeting, the Z standard committee (under ISO/IEC JTC1/SC22 and ANSI X3J21) is meeting and providing an opportunity for ZUM attendees to learn about the proposed international Z standard during part of the day.

After the 1994 Z User Meeting we held a half-day session on educational issues, organized by Neville Dean. This was very successful, and a similar session is to be held immediately after this meeting, again organized by Neville Dean. The forum gives the opportunity for some more interactive discussion in this important area.

We are fortunate to have an excellent selection of invited speakers at ZUM'95. At the last meeting, we found that inviting speakers from outside the Z community was extremely useful in generating debate and fostering cross-fertilization between different parts of the formal methods community at large. Therefore we have continued this newly-established tradition by inviting David Lorge Parnas (McMaster University, Canada), well known for his work on the certification of the Darlington nuclear reactor software using formal methods, John Rushby (SRI International, USA), originator of the PVS theorem prover based on higher-order logic, and Jeannette Wing (Carnegie Mellon University, USA), one of the developers of the Larch algebraic approach to formal specification and verification. In addition, David Gries (Cornell University, USA) is speaking at the educational issues session and giving the after-dinner speech at the conference dinner.

The meeting is organized by the Z User Group (ZUG), in association with the BCS FACS (Formal Aspects of Computing Science) special interest group. For ZUM'95 we are sponsored by BT, who provided student bursaries and some of the expenses for invited speakers, Forbairt for a donation towards the cost of the meeting, Praxis who maintain and run the Z postal mailing list, and the University of Limerick who have made all of their facilities available to us. In addition, the meeting is supported by the ESPRIT ProCoS-WG Working Group (no. 8694) of 24 European industrial and academic partners with an interest in 'Provably Correct Systems', through the provision of funding for attendance by Working Group members.

Norah Power acted as local organizer, and Gemma Ryan organized the bookings for the meeting at the University of Limerick. We are very grateful to Kevin Ryan and Séamus O'Shea for making the facilities of University of Limerick available to us, and for their invaluable support during the organization of the conference.

During the period since ZUM'94, Trevor King (Praxis, UK) has been an extremely efficient Secretary of the Z User Group. Unfortunately work pressures have meant that he must retire from these duties, but Jonathan Hammond, also of Praxis, has been co-opted as a ZUG committee member in his place. We wish Trevor well in his 'retirement'.

In May 1995, a special issue on Z of the *Information and Software Technology* journal was published. This featured revised versions of selected papers presented at the last ZUM, together with some new material. The aim was to include papers covering a balance of issues concerned with the development and use of Z, together with the more recent B-Method and its associated Abstract Machine Notation (AMN) and B-Toolkit. A copy is being issued to all ZUM'95 attendees as part of the delegate's pack.

With the location at Limerick, we decided to hold a limerick competition on Z and formal methods in general. We offer the following in the hope of inspiring a better selection by the end of the conference:

At the Irish School of VDM
They do it because of the TDM.
    But if they tried Z
    It would go to their head;
There seems to be no happy meDM.

For US readers, we offer the following, with a non-deterministic last line:

It's as easy as A - B - C
But then you get to Z.
    It has to be said
    That those who write Z
Don't like to say Z = B.

Further limericks submitted to the competition are held on-line as part of the World Wide Web (WWW) information on the conference to be found under the following URL (Uniform Resource Locator):

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http://www.comlab.ox.ac.uk/archive/z/zum95.html
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This will be kept up to date before and after the meeting with links to any information relevant to ZUM'95. More general information on Z, the B-Method, and other formal methods, maintained as part of the WWW Virtual Library, are also linked from this page.

We hope that ZUM'95 and this associated proceedings will be of interest and benefit to users of Z, and formal methods in general, both in academia and industry.

Oxford & Cambridge
May 1995

Jonathan Bowen (Conference Chair)
Mike Hinchey (Programme Chair)

Programme Committee

Jonathan Bowen, Oxford University, UK (*Conference Chair*)
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Trevor King, Praxis, UK
Kevin Lano, Imperial College, UK
Norah Power, University of Limerick, Ireland (*Tutorial Chair*)
Gordon Rose, University of Queensland, Australia
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David Till, City University, UK
Sam Valentine, University of Brighton, UK
Jim Woodcock, Oxford University, UK
John Wordsworth, IBM UK Laboratories, UK

External Referees

All submitted papers were reviewed by the programme committee and/or a number of external referees. We are very grateful to these people, and apologize in advance for any names omitted from this list:

Rod Abraham
Ralph Becket
Rob Booth
David Carrington
Bernie Cohen
Mark Dawson
Jill Doakes
Tim Drye
Roger Duke
Andy Evans
Stephen Goldsack
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Jeremy Wilson
Pete Young

Sponsors

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BT
Forbairt
Praxis
University of Limerick

Tutorial Programme

Ten tutorials were presented on the three days prior to the main sessions (4th – 6th September); they were:

Formal Methods and Conformance with Open Distributed Processing
H. Bowman & J. Derrick (University of Kent, UK)

An Introduction to Object-oriented Formal Methods
K.C. Lano & S. Goldsack (Imperial College, UK)

Engineering of Complex Real-Time Systems
A.D. Stoyenko & P.A. Laplante (New Jersey Institute of Technology, USA)

An Introduction to Z
J. Turner (Staffordshire University, UK)

Building Models in Z: An Active Approach
N. Dean (Anglia Polytechnic University, UK)

The Rôle of Formal Specifications in Software Test
H.-M. Hörcher & J. Peleska (DST Deutsche System–Technik GmbH, Germany)

A Tutorial on Proof in Standard Z
J.C.P. Woodcock, S.M. Brien & A. Martin (Oxford University, UK)

Formal Methods, Requirements and Testing
M. Mac an Airchinnigh (University of Dublin, Ireland)

Using Z to Rigorously Review Structured Specifications
L. Semmens (Leeds Metropolitan University, UK)

Teaching Logic as a Tool
D. Gries (Cornell University, USA)

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