

# Lecture Notes in Computer Science

669

Edited by G. Goos and J. Hartmanis

Advisory Board: W. Brauer D. Gries J. Stoer



R.S. Bird C.C. Morgan  
J.C.P. Woodcock (Eds.)

# Mathematics of Program Construction

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Series Editors

Gerhard Goos  
Universität Karlsruhe  
Postfach 69 80  
Vincenz-Priessnitz-Straße 1  
W-7500 Karlsruhe, FRG

Juris Hartmanis  
Cornell University  
Department of Computer Science  
4130 Upson Hall  
Ithaca, NY 14853, USA

Volume Editors

Richard S. Bird  
C. Carroll Morgan  
James C. P. Woodcock  
Oxford University Computing Laboratory, Programming Research Group  
11 Keble Road, Oxford OX1 3QD, U.K.

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## Preface

Not very long ago, the uninhibited use of mathematics in the development of software was regarded as something academics should do amongst themselves in private. Today, there is more and more interest from industry in formal methods based on mathematics. This interest has come from the success of a number of experiments on real industrial applications (see, for example, *LNCS*, Vol. 551). Thus, there is not only a belief, but also evidence, that the study of computer programs as mathematical objects leads to more efficient methods for constructing them. However, if we are to be of service to those actually creating computing systems in industry, we must extend and improve our work.

The papers in this volume were presented at the Second International Conference on the *Mathematics of Program Construction*, held at St Catherine's College, Oxford, during the week of 29 June – 3 July, 1992. The conference was organised by Oxford University Programming Research Group, and continued the theme set by the first—the use of crisp, clear mathematics in the discovery and design of algorithms. In this second conference, we see evidence of the ever-widening impact of precise mathematical methods in program development. There are papers applying mathematics not only to sequential programs, but also to parallel and oncurrent applications, real-time and reactive systems, and to designs realised directly in hardware.

The scientific programme for the conference consisted of five invited lectures delivered by distinguished researchers, a further 17 papers selected by the programme committee, and six *ad hoc* contributions presented on the final day. These were as follows:

*A Short Problem*

J.L.A. van de Snepscheut

*Compiler Verification*

Greg Nelson

*An Alternative Derivation of a Binary Heap Construction Function*

Lex Augusteijn

*A Derivation of Huffman's Algorithm*

Rob R. Hoogerwoord

*Galois Connexions*

Roland Backhouse

*An Elegant Solution*

J.L.A. van de Snepscheut

A record of Augusteijn's and Hoogerwoord's contributions may be found at the end of this volume.

## Acknowledgments

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I am most grateful to Miss Frances Page for her expert assistance.

Oxford, February 1993

J.C.P. Woodcock

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