

Contents

<i>List of Contributors</i>	xi
-----------------------------	----

PART I MODELLING AND SPECIFICATION

Some Mathematical Thoughts on Languages for Data Directed Design <i>E. Wagner</i>	3
Algebraic Alternative for Compiler Construction <i>T. Rus</i>	27
Algebraic Semantics and Monad Theory <i>E. Badouel</i>	63
An Illustrated Mathematical Foundation for ERA <i>C. N. G Dampney, M. Johnson and G. P. Monro</i>	77
On the Expressiveness of Equational Type Logic <i>V. Manca, A. Salibra and G. Scollo</i>	85
Linear Term Rewriting Systems are Higher Dimensional String Rewriting Systems <i>M. Johnson</i>	101
Inductive Reasoning for Completing Equational Software Specifications <i>K. P. Jantke</i>	111
Term Induction Proofs by a Generalization of Narrowing <i>U. Fraus and H. Hussmann</i>	125

PART II FORMAL METHODS IN SOFTWARE DEVELOPMENT

Prototyping and Formal Specifications <i>C. Choppy</i>	141
Development of Modular Specifications by Stepwise Refinements Using the PLUSS Specification Language <i>M. Bidoit</i>	171
Software Complexity Measures, Programming Methodologies, and the Size of Machines <i>J. C. Cherniavsky and C. H. Smith</i>	193
The Implementation of Z Specifications using Program Transformation Systems: The SuZan Project <i>R. Knott and P. Krause</i>	207
The Systematic Reduction of VDM Specifications <i>A. P. French, G. P. McKeown and V. J. Rayward-Smith</i>	221
Experiences with Using Formal Specification Techniques for Operations Research Problems <i>A. P. French, G. P. McKeown and V. J. Rayward-Smith</i>	233
A Survey of Temporal Logic Methods in System Development <i>N. J. Wilson</i>	243

PART III SPECIFICATION FOR COMMUNICATION AND CONCURRENCY

Integrating Automata and Temporal Logic: A Framework for Specification of Real-Time Systems and Software <i>A. Gabrielian and R. Iyer</i>	261
Specification And Derivation Of Process Networks <i>F. Carrez and D. Mery</i>	275
Algebraic Term Nets : A Formalism for Specifying Communication Software in the OSI Framework <i>M. Bettaz and A. Choutri</i>	293
Using LOTOS in the Object-Based Development of Embedded Systems <i>R. G. Clark</i>	307

A Data Type Specification for the Process Part of Basic LOTOS — An Axiomatic Semantics <i>G. H. B. Rafsanjani</i>	321
Modelling of LOTOS Specifications by Petri Nets <i>G. H. B. Rafsanjani</i>	333
PART IV PROGRAM VERIFICATION AND DEVELOPMENT	
Modules and Verification <i>G. Antoniou</i>	353
Program Analysis by Symbolic Execution and Generalization <i>G. Colman, P. Andreae and L. Groves</i>	367
Proving and Developing Concurrent Programs - a Small System <i>D. Mery</i>	381
Automated Proof and Program Development <i>D. Galmiche and O. Hermann</i>	397
Interactive Automated Verification of Functional Programming Languages <i>R. B. Hughes and R. M. Zimmer</i>	411
Theorem Proving and Program Synthesis with Oyster <i>C. Horn and A. Smaill</i>	425
The PICT System <i>A. G. Hamilton</i>	437
X An Interactive Tool for Deriving Correct Programs <i>L. Groves and R. Nickson</i>	449