

Table of Contents

Part I. Development Models and Reusability

Two Metamodels for Application System Development - Conventional vs. Object-Oriented Approach	3
<i>W. Hesse</i>	
Transformational Meta Program Development	19
<i>B. Krieg-Brückner</i>	
Another Case Study on Reusability of Transformational Developments Pattern Matching According to Knuth, Morris, and Pratt	35
<i>H.A. Partsch, N. Völker</i>	
A Formal Method for the Systematic Reuse of Specification Components	49
<i>R. Hennicker, M. Wirsing</i>	

Part II. Deductive Program Development

Deductive Program Development: Evaluation in Reverse Polish Notation as an Example	79
<i>M. Broy</i>	
Literate Program Derivation: A Case Study	101
<i>P. Pepper</i>	
Programs Viewed as SKOLEM Functions	125
<i>R. Steinbrüggen</i>	

Part III. Case Studies in Development

Calculating a Garbage Collector	137
<i>U. Berger, W. Meixner, B. Möller</i>	
On the Use of Elements of Functional Programming in Program Development by Transformations	193
<i>R. Berghammer, H. Ehler</i>	
Transformational Development of Circuit Descriptions for Binary Adders.....	217
<i>C. Delgado Kloos, W. Dosch</i>	
Subject Index.....	239
Author Index	241
Bibliography of the Project CIP	243

PART I

Development Models and Reusability

Two Metamodels for Application System Development - Conventional vs. Object-Oriented Approach	3
<i>W. Hesse</i>	
1 Introduction	3
2 The Four-Level Metamodel	5
3 Discussion of the Four-Level Metamodel	9
4 Principles of the Object-Oriented Approach	12
5 An Object-Oriented Metamodel for Application Modelling	13
6 Two Procedures for Application Modelling - a Comparison	15
7 Conclusions	16
References	17
Transformational Meta Program Development	19
<i>B. Krieg-Brückner</i>	
1 Introduction	19
2 Algebraic Specification	20
3 Functionals	22
4 Formalisation of Program Transformations	24
5 Formalisation of Transformational Program Developments	28
6 Conclusion	30
References	32
Another Case Study on Reusability of Transformational Developments	
Pattern Matching According to Knuth, Morris, and Pratt	35
<i>H.A. Partsch, N. Völker</i>	
1 Introduction	36
2 Preliminaries and Notational Conventions	36
3 Deriving Knuth, Morris, and Pratt's Algorithm by Reuse	37
4 Deriving a Deterministic Version of σ'	41
5 Final Version of the Function <i>occurs</i>	42
6 Deriving a Fully Operational Definition for σ''	44
7 Remarks on Further Development	45
8 Concluding Remarks	46
References	47
A Formal Method for the Systematic Reuse of Specification Components	49
<i>R. Hennicker, M. Wirsing</i>	
1 Introduction	49
2 Structured Algebraic Specifications	51
3 Reusable Components	60
4 Systematic Reuse of Components	67
5 Concluding Remarks	74
References	75