

Contents

Part I Introduction

1	State of the Art on Formal Methods for Interactive Systems	3
	Raquel Oliveira, Philippe Palanque, Benjamin Weyers, Judy Bowen and Alan Dix	
2	Topics of Formal Methods in HCI	57
	Judy Bowen, Alan Dix, Philippe Palanque and Benjamin Weyers	
3	Trends and Gaps	65
	Alan Dix, Benjamin Weyers, Judy Bowen and Philippe Palanque	
4	Case Studies	89
	Benjamin Weyers, Michael D. Harrison, Judy Bowen, Alan Dix and Philippe Palanque	

Part II Modeling, Execution and Simulation

5	Visual and Formal Modeling of Modularized and Executable User Interface Models	125
	Benjamin Weyers	
6	Combining Models for Interactive System Modelling	161
	Judy Bowen and Steve Reeves	
7	Activity Modelling for Low-Intention Interaction	183
	Alan Dix	
8	Modelling the User	211
	Paul Curzon and Rimvydas Rukšėnas	

9	Physigrams: Modelling Physical Device Characteristics Interaction	247
	Alan Dix and Masitah Ghazali	
10	Formal Description of Adaptable Interactive Systems Based on Reconfigurable User Interface Models	273
	Benjamin Weyers	

Part III Analysis, Validation and Verification

11	Learning Safe Interactions and Full-Control	297
	Guillaume Maudoux, Charles Pecheur and Sébastien Combéfis	
12	Reasoning About Interactive Systems in Dynamic Situations of Use	319
	Judy Bowen and Annika Hinze	
13	Enhanced Operator Function Model (EOFM): A Task Analytic Modeling Formalism for Including Human Behavior in the Verification of Complex Systems	343
	Matthew L. Bolton and Ellen J. Bass	
14	The Specification and Analysis of Use Properties of a Nuclear Control System	379
	Michael D. Harrison, Paolo M. Masci, José Creissac Campos and Paul Curzon	
15	Formal Analysis of Multiple Coordinated HMI Systems	405
	Guillaume Brat, Sébastien Combéfis, Dimitra Giannakopoulou, Charles Pecheur, Franco Raimondi and Neha Rungta	

Part IV Future Opportunities and Developments

16	Domain-Specific Modelling for Human–Computer Interaction	435
	Simon Van Mierlo, Yentl Van Tendeloo, Bart Meyers and Hans Vangheluwe	
17	Exploiting Action Theory as a Framework for Analysis and Design of Formal Methods Approaches: Application to the CIRCUS Integrated Development Environment	465
	Camille Fayollas, Célia Martinie, Philippe Palanque, Eric Barboni, Racim Fahssi and Arnaud Hamon	
18	A Public Tool Suite for Modelling Interactive Applications	505
	Marco Manca, Fabio Paternò and Carmen Santoro	

Contents	xiii
19 Formal Modelling of App-Ensembles	529
Johannes Pfeffer and Leon Urbas	
20 Dealing with Faults During Operations: Beyond Classical Use of Formal Methods	549
Camille Fayollas, Philippe Palanque, Jean-Charles Fabre, Célia Martinie and Yannick Déléris	
Erratum to: The Handbook of Formal Methods in Human-Computer Interaction	E1
Benjamin Weyers, Judy Bowen, Alan Dix and Philippe Palanque	