

The Rubato Composer Music Software

Component-Based Implementation of a Functorial Concept Architecture

Bearbeitet von
G rard Milmeister, Guerino Mazzola, Florian Thalmann

1. Auflage 2009. Buch. xx, 301 S. Hardcover

ISBN 978 3 642 00147 5

Format (B x L): 15,5 x 23,5 cm

Gewicht: 1390 g

[Weitere Fachgebiete > EDV, Informatik > Professionelle Anwendung > Multimedia](#)

Zu [Leseprobe](#)

schnell und portofrei erh ltlich bei

The logo for beck-shop.de features the text 'beck-shop.de' in a bold, red, sans-serif font. Above the 'i' in 'shop' are three red dots of increasing size. Below the main text, 'DIE FACHBUCHHANDLUNG' is written in a smaller, red, all-caps sans-serif font.

beck-shop.de
DIE FACHBUCHHANDLUNG

Die Online-Fachbuchhandlung [beck-shop.de](#) ist spezialisiert auf Fachb cher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (B cher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Erg nzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von B chern zu Sonderpreisen. Der Shop f hrt mehr als 8 Millionen Produkte.

Contents

Part I Concepts and Theory

1	Overview of Music Theories	3
2	The Representation of Music	7
2.1	Types of Representation	7
2.2	Symbolic Representation of Music	9
2.2.1	Electronic Scores	10
2.2.2	MIDI	13
2.2.3	Musical Representation Languages	14
2.2.4	Language of General Concepts	18
3	Architecture of Concepts I: Principles	19
3.1	Pure Architecture	19
3.1.1	Selection	20
3.1.2	Conjunction	21
3.1.3	Disjunction	21
3.2	Architecture with Primitives	22
3.3	Examples	24
3.3.1	Macro Notes	25
3.3.2	Frequency Modulation	26
3.3.3	Full Score	27
4	The Category of Modules	31
4.1	From Monoids to Modules	31
4.1.1	Monoids	32

4.1.2	Groups	33
4.1.3	Rings	33
4.1.4	Modules	37
4.2	Categories	41
4.2.1	Definition	41
4.2.2	Functors	43
4.2.3	Natural Transformations	45
4.2.4	Yoneda's Lemma	48
4.2.5	Limits and Colimits	49
4.2.6	Topoi	52
5	Architecture of Concepts II: Forms and Denotators	55
5.1	Forms	55
5.2	Denotators	57
5.3	Computational Category Theory	58
5.3.1	Data Types in Programming Languages	58
5.3.2	The Role of Diagrams	61
6	Software Components for Computational Theories	65
6.1	Types of User Interface	66
6.2	Rubato Composer: Computational Theories	69
7	Historical Overview	71
7.1	<i>presto</i>	71
7.2	"Classic" RUBATO	73
7.3	Experiments in Java	75
7.4	RUBATO COMPOSER	76
 Part II The Implementation		
8	Overview	79
9	Architecture	81
9.1	Overall Structure	81
9.2	The RUBATO COMPOSER Universe	83
9.3	Java Packages	85
10	Modules and Morphisms	87

10.1	Modules and their Elements	87
10.1.1	The Module Interface	87
10.1.2	The ModuleElement Interface.....	91
10.2	Module Morphisms	95
10.2.1	The ModuleMorphism Interface.....	95
11	Forms and Denotators	105
11.1	Requirements	105
11.2	Forms	106
11.2.1	Form Class	107
11.2.2	SimpleForm Class.....	109
11.2.3	LimitForm and ColimitForm Classes.....	109
11.2.4	PowerForm and ListForm Classes.....	110
11.3	Denotators	110
11.3.1	SimpleDenotator Class.....	113
11.3.2	LimitDenotator Class.....	114
11.3.3	ColimitDenotator Class.....	115
11.3.4	PowerDenotator and ListDenotator Classes.....	115
11.4	Tools and Operations	116
11.4.1	Construction of Forms and Denotators.....	116
11.4.2	Paths	118
11.4.3	Module Mapping and Structural Replacement	119
11.4.4	Reforming.....	120
11.4.5	Address Changing.....	123
11.4.6	List and Set Operations	124
12	Tools and Utilities.....	127
12.1	Low-Level Mathematical Tools	127
12.1.1	Numbers.....	127
12.1.2	Matrixes	128
12.2	Repository and Predefined Universe	128
12.3	MIDI Sequencer and Synthesizer	130
12.4	Scheme Interpreter	131
12.5	XML as File Format for RUBATO COMPOSER	132
13	Rubato Composer GUI.....	135
13.1	Terminology.....	135

13.2	The Implementation of Networks	136
13.3	Running a Network	138
13.4	Macro Rubettes	141
13.5	Tools	144
13.6	The Plug-In System	144
 Part III Rubato Composer in Practice		
14	Overview	151
15	A Tutorial	153
16	First Applications in Rubette Construction	167
16.1	Rubettes for Macro Objects	167
16.2	The Wallpaper Rubette	170
16.3	The Alteration Rubette	176
16.4	Counterpoint Theory	179
16.5	Music Composition	180
17	The BigBang Rubette	183
17.1	Spontaneous Algorithmic Composition	183
17.1.1	Facts about Geometric Composition Strategies	184
17.2	Gestural Interaction Concept	185
17.2.1	Gesture Theory	185
17.2.2	Application of Gesture Theory	187
17.3	Modular Views	188
17.3.1	View Concept	188
17.3.2	Note representation	189
17.3.3	Basic Functionality and Navigation	193
17.3.4	Layers	193
17.4	Implemented Gestures	194
17.4.1	Geometrical Transformations	195
17.4.2	Wallpapers	196
17.4.3	Alteration	198
17.5	The BigBang Rubette in Context	199
18	Creative Analysis of Boulez's <i>Structures</i>	201
18.1	Boulez's Creative Analysis Revisited	201

18.2	Ligeti's Analysis	201
18.3	A First Creative Analysis of <i>Structure Ia</i>	203
18.3.1	Address Change	204
18.3.2	Primary Parameter Address Changes	205
18.3.3	Secondary Parameter Address Changes	206
18.3.4	The First Creative Analysis	208
18.4	Implementing Creative Analysis in RUBATO COMPOSER ..	209
18.4.1	The System of Boulettes	211
18.5	A Second More Creative Analysis and Reconstruction	213
18.5.1	The Conceptual Extensions	214
18.5.2	The <i>BigBang</i> Rubette	219
18.5.3	A Composition	221
19	Conclusion and Outlook	227
19.1	Lessons Learned	227
19.2	Things To Do	228
19.3	Ideas for Future Work	229

Part IV Appendix

20	User's Manual	233
20.1	Introduction	233
20.2	Concepts	233
20.2.1	RUBATO COMPOSER's World of Objects	233
20.2.2	Rubettes	234
20.2.3	Networks	236
20.2.4	Macro Rubettes	237
20.2.5	Tools	238
20.3	Using RUBATO COMPOSER	238
20.3.1	Starting up	238
20.3.2	General Usage	238
20.3.3	Main Window	239
20.3.4	Main Menu and Toolbar	240
20.3.5	Network	242
20.3.6	Tools	244
20.3.7	Scheme Tools	251
20.3.8	Preferences	252

20.3.9	Recurring User Interface Elements	253
20.4	Core Rubettes	257
20.4.1	Rubette Description Schema	257
20.4.2	List of Core Rubettes	258
20.5	Built-in Non-Core Rubettes	269
20.6	Writing Rubettes	271
20.6.1	Developing with the RUBATO Framework	271
20.6.2	Rubette Interface	273
20.7	Rubette Example	279
20.7.1	Specification	279
20.7.2	The LatchRubette class	279
20.7.3	Packaging a Plug-In	284
20.8	Types of Module Morphisms	285
20.9	The Rubette Java Interface	287
20.10	Example LatchRubette class	288
20.11	Keyboard Shortcuts	291
20.12	Rubato Scheme	292