

Contents

Preface	V
FMEC: Overview and Interpretation	1
<i>Steven O. Kimbrough, D.J. Wu</i>	
1 Introduction.....	1
2 Formalisms.....	2
3 Themes.....	5
4 Topics.....	6
5 A Brief Guide to the Volume	7
6 Upwards and Onwards.....	13
7 Acknowledgements	18
A FMEC Bibliographic History	18

Part I. Representation: Objects, Processes & Policies

Practical Contract Storage, Checking, and Enforcement for Business Process Automation.....	33
<i>Alan Abrahamis, David Eysen, Jean Bacon</i>	
1 Introduction.....	33
2 Contributions	35
3 Application Scenario	36
4 Overview	37
5 Occurrences	40
6 Kimbrough's Disquotation Theory	45
7 An Implementation of Kimbrough's Disquotation Theory	47
8 Contract Provision Monitoring.....	59
9 Contract Performance and Enforcement.....	61
10 Software Implementation.....	65
11 Related Work	71
12 Conclusions	72
13 Acknowledgements	73
A Coverage Checking Rules	74
Legitimacy Checking in Communicative Workflow Design.....	79
<i>Aldo de Moor, Hans Weigand</i>	
1 Introduction.....	79
2 The Extended Workflow Loop	81
3 Extended Workflow Loop Norms	82
4 Workflow Loop Schemas	86
5 A Method for Legitimacy Checking.....	89

6	Conclusions	97
---	-------------------	----

**CANDID Specification of Commercial and Financial Contracts,
Part I: Syntax & Formal Semantics of CANDID** 101

Ronald M. Lee

1	Introduction.....	101
2	The Language L_1	103
3	Re-Interpretation of Predicates	106
4	Many-Sorted, Type-Theoretic Languages	107
5	λ Abstraction	108
6	Operations, Definite Reference	110
7	Summary of the Language L_v	111
8	Character Strings, Labels	114
9	Numbers and Measurement	115
10	Time, Realization, Change	117
11	Possible Worlds, Intensions	122
12	Summary of the Language IL.....	125
13	Action.....	130
14	Modals, Deontic Operators	131
15	Summary of the Language CANDID	136

**CANDID Specification of Commercial and Financial Contracts,
Part II: Formal Description of Economics Actors and Objects 145**

Ronald M. Lee

1	Introduction.....	145
2	Economic Actors.....	150
3	Economic Objects.....	153
4	Summary	157

**CANDID Specification of Commercial and Financial Contracts,
Part III: CANDID Specification of Financial Concepts** 159

Ronald M. Lee

1	Introduction.....	159
2	Additional Definitions, Notational Conventions	160
3	Elementary Financial Concepts	161
4	Financial Instruments	167
5	Concluding Remarks.....	176

**Performatives, Performatives Everywhere but Not a Drop of
Ink** 177

Ronald M. Lee

1	Performative Aspects of Commerce and Public Administration	177
2	Issues for Open Electronic Commerce.....	186
3	From Ink to Bits: Original, Signed Writings	188
4	Computational Modeling of Documentary Procedures.....	192
5	Protocols for Procedure Adoption	194

6	Discussion and Further Research Directions	197
7	Acknowledgments	198

EDI, XML, and the Transparency Problem in Electronic Commerce

Steven O. Kimbrough

1	EDI and the Transparency Problem	202
2	XML's Pertinent Virtues and Limitations	203
3	Communications Requisites	206
4	microFLBC and the Transparency Problem	211
5	Back to XML	221
6	Conclusion	224

Part II. Applications

Designing Control Mechanisms for Value Exchanges in Network Organisations

Vera Kartseva, Yao-Hua Tan

1	Introduction	231
2	A Methodology for Designing Control Mechanisms	233
3	Modelling Business Value Models	234
4	Modelling Sub-Ideal Situations	236
5	Distinguishing Different Types of Control Mechanisms	243
6	Conclusions	244

Sim-I-Space: An Agent-Based Modelling Approach to Knowledge Management Processes

Max Boisot, Ian MacMillan, Kyeong Seok Han, Casey Tan, Si Hyung Eun

1	Introduction	247
2	Model Architecture	248
3	Model Components	252
4	Acknowledgements	263
A	Description of Variables	263
B	Detailed Model Specification with Example	278

Part III. Communication

On Representing Special Languages with FLBC: Message Markers and Reference Fixing in SeaSpeak

Steven O. Kimbrough, Yinghui (Catherine) Yang

1	Introduction	297
2	Special Languages	298
3	Two Problems	300

4	Background on SeaSpeak	302
5	Prototype Example: INFORMATION	304
6	Problems of Reference Fixing	307
7	Formalizing Distributed Descriptions into FLBC	312
8	Analysis of the Remaining SeaSpeak Message Markers	315
9	Discussion and Conclusion	320

A Note on Modelling Speech Acts as Signalling Conventions.. 325

Andrew J.I. Jones, Steven Orla Kimbrough

1	Introduction.....	325
2	Asserting: Two Prototypes	326
3	Other Speech Acts	330
4	Discussion: Towards Deployment	334
5	Summary and Conclusion	339

Dynamic Conversation Structures: An Extended Example 343

Scott A. Moore

1	Introduction.....	343
2	Extended Example	345
3	Conclusion	359

Part IV. Agents and Strategic Interactions

Investigating the Value of Information and Computational Capabilities by Applying Genetic Programming to Supply Chain Management

Scott A. Moore, Kurt Demaagd

1	Introduction.....	363
2	The Evolutionary Process	366
3	Plan of Investigation	380
4	Summary	387
A	Terminals and Functions	388
B	Settings for a Scenario	389
C	Computing-Related Information	390

Multi-Agent Simulation of Financial Markets

Olya Streltchenko, Yelena Yesha, Timothy Finin

1	Introduction.....	393
2	Automation of Modern Financial Markets	394
3	Simulation of Financial Markets	399
4	A Multi-Agent Environment for Financial Market Simulation	404
5	Conclusions	416

Adaptive Agents in Coalition Formation Games	421
<i>Alex K. Chavez</i>	
1 Introduction	421
2 Background and Description	422
3 Learning Models	425
4 Results	430
5 Conclusion	435
6 Acknowledgements	437
A Parameter Estimates	438
 On Learning Negotiation Strategies by Artificial Adaptive Agents in Environments of Incomplete Information	445
<i>Jim R. Oliver</i>	
1 Introduction	445
2 Overview of the Approach	448
3 AAA Platform	448
4 Structure of the Bargaining Space	451
5 Experimental Testing and Results	453
6 Conclusion	459
 A Note on Strategic Learning in Policy Space	463
<i>Steven O. Kimbrough, Ming Lu, Ann Kuo</i>	
1 Introduction	463
2 Background: Games and Decisions	463
3 Repeated Games	466
4 Simple Reinforcement Learning	467
5 Learning in Policy Space	469
6 Discussion	473
7 Acknowledgements	474
 Learning and Tacit Collusion by Artificial Agents in Cournot Duopoly Games	477
<i>Steven O. Kimbrough, Ming Lu, Frederic Murphy</i>	
1 Introduction	477
2 The Duopoly Game: Holt's Cournot Model	478
3 Background and Application Context: Electricity Markets	479
4 Framework for Agent Learning	481
5 Molecular Strategies in the Cournot Game	483
6 Summary of Results	486
7 Discussion	487
8 Acknowledgements	490

A Note on Working Memory in Agent Learning	493
<i>Fang Zhong</i>	
1 Introduction	493
2 The Exchange Game	494
3 Learning Mechanism	497
4 Experiments on Working Memory	499
5 Discussion	504
6 Conclusion	505
7 Acknowledgements	506
A Parameter Values	506
 Investigations of Granularity and Payoffs in 2×2 Games under Replicator Dynamics	509
<i>Sofia Chajadine, Daniel Mack, Aaron Jeffrey Slan</i>	
1 Introduction	509
2 The Games	510
3 Methodology	514
4 Discussion of Findings	516
5 Acknowledgements	525
A Summary of Simulations	525
<hr/>	
Part V. References and Index	
References	531
Index	557



<http://www.springer.com/978-3-540-21431-1>

Formal Modelling in Electronic Commerce

Kimbrough, S.O.; Wu, D. (Eds.)

2005, XII, 562 p., Hardcover

ISBN: 978-3-540-21431-1