

CONTENTS

<i>Contributors</i>	<i>xi</i>
<i>Preface</i>	<i>xiii</i>
<i>Introduction to the Series</i>	<i>xv</i>
1. Rationality	1
Ken Binmore	
1.1 Neoclassical Rationality	2
1.2 Revealed Preference	5
1.3 Decisions under Risk	8
1.4 Bayesian Decision Theory	10
1.5 Knowledge	14
1.6 Nash Equilibrium	18
1.7 Black Boxes	21
1.8 Conclusion	24
Acknowledgments	24
References	25
2. Advances in Zero-Sum Dynamic Games	27
Rida Laraki, Sylvain Sorin	
2.1 Introduction	29
2.2 Recursive Structure	33
2.3 Asymptotic Analysis	38
2.4 The Dual Game	52
2.5 Uniform Analysis	57
2.6 Differential Games	63
2.7 Approachability	68
2.8 Alternative Tools and Topics	73
2.9 Recent Advances	77
Acknowledgments	87
References	87
3. Games on Networks	95
Matthew O. Jackson, Yves Zenou	
3.1 Introduction and Overview	96
3.2 Background Definitions	98
3.3 Strategic Complements and Strategic Substitutes	103

3.4	A Model with Continuous Actions, Quadratic Payoffs, and Strategic Complementarities	116
3.5	Network Games with Incomplete Information	132
3.6	Choosing Both Actions and Links	141
3.7	Repeated Games and Network Structure	150
3.8	Concluding Remarks and Further Areas of Research	151
	Acknowledgments	156
	References	157

4. Reputations in Repeated Games 165

George J. Mailath, Larry Samuelson

4.1	Introduction	166
4.2	Reputations with Short-Lived Players	168
4.3	Reputations with Two Long-Lived Players	196
4.4	Persistent Reputations	210
4.5	Discussion	228
	Acknowledgments	236
	References	236

5. Coalition Formation 239

Debraj Ray, Rajiv Vohra

5.1	Introduction	240
5.2	The Framework	244
5.3	The Blocking Approach: Cooperative Games	256
5.4	The Bargaining Approach: Noncooperative Games	283
5.5	The Welfare Economics of Coalition Formation	303
5.6	Coalition Formation: The Road Ahead	319
	Acknowledgments	322
	References	322

6. Stochastic Evolutionary Game Dynamics 327

Chris Wallace, H. Peyton Young

6.1	Evolutionary Dynamics and Equilibrium Selection	328
6.2	Equilibrium Selection in 2×2 Games	335
6.3	Stochastic Stability in Larger Games	340
6.4	Bargaining	349
6.5	Public Goods	354
6.6	Network Games	364
6.7	Speed of Convergence	369
6.8	Concluding Remarks	377
	References	378

7. Advances in Auctions	381
Todd R. Kaplan, Shmuel Zamir	
7.1 Introduction	382
7.2 First-Price Auctions: Theoretical Advances	383
7.3 Multiunit Auctions	391
7.4 Dynamic Auctions	396
7.5 Externalities in Single-Object Auctions	402
7.6 Auctions with Resale	405
7.7 All-Pay Auctions	409
7.8 Incorporating Behavioral Economics	421
7.9 Position Auctions in Internet Search	430
7.10 Spectrum Auctions	437
7.11 Concluding Remarks	444
Acknowledgments	444
References	445
8. Combinatorial Auctions	455
Rakesh V. Vohra	
8.1 Introduction	455
8.2 Supporting Prices	457
8.3 Incentives	464
8.4 Complexity Considerations	472
References	474
9. Algorithmic Mechanism Design: Through the Lens of Multiunit Auctions	477
Noam Nisan	
9.1 Introduction	478
9.2 Algorithmic Mechanism Design and This Survey	479
9.3 Representation	483
9.4 Algorithms	488
9.5 Payments, Incentives, and Mechanisms	496
9.6 Conclusion	514
Acknowledgments	514
References	514
10. Behavioral Game Theory Experiments and Modeling	517
Colin F. Camerer, Teck-Hua Ho	
10.1 Introduction	518
10.2 Cognitive Hierarchy and Level-k Models	520

10.3	Quantal Response Equilibrium	530
10.4	Learning	535
10.5	<i>Sophistication and Teaching</i>	551
10.6	Sociality	560
10.7	Conclusion	566
	References	567
11.	Evolutionary Game Theory in Biology	575
	Peter Hammerstein, Olof Leimar	
11.1	Strategic Analysis—What Matters to Biologists?	576
11.2	Sex Ratios—How the Spirit of Game Theory Emerged in Biology	578
11.3	<i>The Empirical Success of Sex-Ratio Theory</i>	584
11.4	Animal Fighting and the Official Birth of Evolutionary Game Theory	588
11.5	Evolutionary Dynamics	592
11.6	Intragenomic Conflict and Willful Passengers	595
11.7	Cooperation in Microbes and Higher Organisms	598
11.8	Biological Trade and Markets	603
11.9	Animal Signaling—Honesty or Deception?	605
	References	611
12.	Epistemic Game Theory	619
	Eddie Dekel, Marciano Siniscalchi	
12.1	Introduction and Motivation	620
12.2	Main Ingredients	624
12.3	Strategic Games of Complete Information	632
12.4	Equilibrium Concepts	637
12.5	Strategic-Form Refinements	650
12.6	<i>Incomplete information</i>	654
12.7	Extensive-Form Games	667
12.8	Admissibility	689
	Acknowledgement	697
	References	697
13.	Population Games and Deterministic Evolutionary Dynamics	703
	William H. Sandholm	
13.1	Introduction	705
13.2	Population Games	707
13.3	Revision Protocols and Mean Dynamics	712
13.4	Deterministic Evolutionary Dynamics	718

13.5	Families of Evolutionary Dynamics	720
13.6	Potential Games	734
13.7	ESS and Contractive Games	742
13.8	Iterative Solution Concepts, Supermodular Games, and Equilibrium Selection	751
13.9	Nonconvergence of Evolutionary Dynamics	757
13.10	Connections and Further Developments	764
	Acknowledgements	770
	References	770
14.	The Complexity of Computing Equilibria	779
	Christos Papadimitriou	
14.1	The Task	779
14.2	Problems and Algorithms	780
14.3	Good Algorithms	781
14.4	P and NP	784
14.5	Reductions and NP-complete Problems	786
14.6	The Complexity of Nash Equilibrium	789
14.7	Approximation, Succinctness, and Other Topics	801
	Acknowledgments	808
	References	808
15.	Theory of Combinatorial Games	811
	Aviezri S. Fraenkel, Robert A. Hearn, Aaron N. Siegel	
15.1	Motivation and an Ancient Roman War-Game Strategy	812
15.2	The Classical Theory, Sum of Games, Complexity	815
15.3	Introducing Draws	821
15.4	Adding Interactions Between Tokens	826
15.5	Partizan Games	831
15.6	Misère Play	840
15.7	Constraint Logic	845
15.8	Conclusion	856
	Acknowledgment	857
	References	857
16.	Game Theory and Distributed Control	861
	Jason R. Marden, Jeff S. Shamma	
16.1	Introduction	862
16.2	Utility Design	865
16.3	Learning Design	873

16.4	Exploiting the Engineering Agenda: State-Based Games	885
16.5	Concluding Remarks	895
	<i>References</i>	896
17.	Ambiguity and Nonexpected Utility	901
	Edi Karni, Fabio Maccheroni, Massimo Marinacci	
17.1	Introduction	902
	Part I Nonexpected Utility Theory Under Risk	904
17.2	Nonexpected Utility: Theories and Implications	904
17.3	Rank-Dependent Utility Models	913
17.4	Cumulative Prospect Theory	919
	Part II Nonexpected Utility Theory Under Uncertainty	921
17.5	Decision Problems under Uncertainty	921
17.6	Uncertainty Aversion: Definition and Representation	929
17.7	Beyond Uncertainty Aversion	935
17.8	Alternative Approaches	938
17.9	Final Remarks	943
	<i>Acknowledgments</i>	943
	<i>References</i>	943
18.	Calibration and Expert Testing	949
	Wojciech Olszewski	
18.1	Introduction	950
18.2	Terminology and Notation	951
18.3	Examples	954
18.4	Calibration	957
18.5	Negative Results	962
18.6	Positive Results	968
18.7	Restricting the Class of Allowed Data-Generating Processes	973
18.8	Multiple Experts	975
18.9	Bayesian and Decision-Theoretic Approaches to Testing Experts	978
18.10	Related Topics	980
	<i>Acknowledgment</i>	983
	<i>References</i>	983
	Index	985