

Preface

Complex automated negotiations are a widely studied, emerging area in the field of autonomous agents and multi-agent systems. In general, automated negotiations can be complex, since there are many factors that characterize such negotiations. These factors include the number of issues, dependency between issues, representation of utility, negotiation protocol, negotiation form (bilateral or multiparty), time constraints, and so on. Software agents can support automation or simulation of such complex negotiations on behalf of their owners and can provide them with adequate bargaining strategies. In many multi-issue bargaining settings, negotiation becomes more than a zero-sum game, so bargaining agents have an incentive to cooperate in order to achieve efficient win-win agreements. Also, in a complex negotiation, there could be multiple issues that are interdependent. Thus, an agent's utility will become more complex than simple utility functions. Further, negotiation forms and protocols could be different between bilateral situations and multi-party situations. To realize such a complex automated negotiation, we have to incorporate advanced artificial intelligence technologies including search, CSP, graphical utility models, Bayesian nets, auctions, utility graphs, and predicting and learning methods. Applications could include e-commerce tools, decision-making support tools, negotiation support tools, collaboration tools, and others. For this book, we solicited papers on all aspects of such complex automated negotiations that are studied in the field of autonomous agents and multi-agent systems.

This book includes Part I, Agent-Based Complex Automated Negotiations; and Part II, Automated Negotiation Agents Competition. Each chapter in Part I is an extended version of an International Workshop on Agent-Based Complex Automated Negotiations (ACAN) paper after peer reviews by three PC members. Part II includes Automated Negotiating Agents Competition (ANAC), in which automated agents that have different negotiation strategies and are implemented by different developers automatically negotiate in several negotiation domains. ANAC is an international competition in which automated negotiation strategies, submitted by a number of universities and research institutes across the world, are evaluated in a tournament style. The purpose of the competition is to steer the research in the area of bilateral multi-issue, closed negotiation. Closed negotiation, when opponents do

not reveal their preferences to each other, is an important class of real-life negotiations. Negotiating agents designed using a heuristic approach need extensive evaluation, typically through simulations and empirical analysis, since it is usually impossible to predict precisely how the system and the constituent agents will behave in a wide variety of circumstances, using purely theoretical tools. This book includes rules, results, agents, and domain descriptions for ANAC2013 submitted by organizers and finalists. The reports from the ANAC2013 competition highlight important aspects that should be considered in future works on automated negotiation.

Finally, we would like to extend our sincere thanks to all authors. This book would not have been possible without the valuable support and contributions of those who cooperated with us.

Japan, December 2014

Katsuhide Fujita
Takayuki Ito
Minjie Zhang
Valentin Robu

Next Frontier in Agent-based Complex Automated
Negotiation

Fujita, K.; Ito, T.; Zhang, M.; Robu, V. (Eds.)

2015, X, 151 p. 69 illus., 45 illus. in color., Hardcover

ISBN: 978-4-431-55524-7