

Transactions on Computational Collective Intelligence XXIII

Preface

It is my pleasure to present to you the XXIII volume of LNCS *Transactions on Computational Collective Intelligence*. In Autumn 2015 (November 20–21) at the WSB University in Wrocław, Poland, there was a seminar on “Quantitative Methods of Group Decision Making.” Thanks to the WSB University in Wrocław we had an excellent opportunity to organize and financially support the seminar. This volume presents papers of participants in this seminar. During the seminar we listened to and discussed over 17 presentations. The XXIII issue of TCCI contains 14 high-quality, carefully reviewed papers.

The first paper “Robustness of Legislative Procedures of the Italian Parliament” by Chiara De Micheli and Vito Fragnelli is devoted to the analysis of the correlation between higher or lower use of different procedures for approving the laws (this is what the Italian Constitution allows) and the “strength” of the government and of the parliament, measured through two parameters: governability and fragmentation.

The second paper entitled “Approval Voting as a Method of Prediction in Political Voting. Case of Polish Elections” by Krzysztof Przybyszewski and Honorata Sosnowska presents an application of approval voting to political analyses. The Polish 2015 presidential and parliamentary elections are considered. A question regarding voting by the approval voting method was included in the voting polls. Experiments deal with polls over representative samples and offer the possibility to predict a winner of the second round of presidential elections and those parliamentary coalitions that may be approved by groups of voters supporting given parties.

In the third paper, “The Complexity of Voter Control and Shift Bribery under Parliament Choosing Rules,” Tomasz Put and Piotr Faliszewski study the complexity of voter control and shift bribery problems under two parliament choosing rules, one based on the Plurality rule and one based on the Borda rule (considering both the case where there is a threshold a party needs to pass to enter parliament, and the case where there is no such threshold). A parliament choosing rule is a function that given a preference profile of the voters (where each voter ranks political parties) outputs the fraction of seats each of the parties should receive in the parliament. They study the complexity of three problems, shift bribery, control by adding voters, and control by deleting voters, where some agent modifies the election in order to increase the fraction of the seats in parliament assigned to a given party. The authors show that in most cases these problems can be solved in polynomial time for parliament choosing rules, but they also show several NP-hardness results (for the Borda-based rule, for the case where there is a threshold for entering the parliament).

The fourth paper “National Interests in the European Parliament: Roll Call Vote Analysis” by Wojciech Słomczyński and Dariusz Stolicki proposes a novelty method for identifying national interests in the European Parliament by comparing roll call vote results with MEPs’ expected ideological positions. They define a new measure – national shift index, corresponding to the magnitude of a national delegation’s shift from the aggregate ideological position – which quantifies the influence of the national interest on the voting results. Using this measure, they identify issues characterized by the strongest dominance of national factors and compare national delegations’ propensity to vote along national lines.

In the fifth paper entitled “Voting and Communication when Hiring by Committee” Paula Mäkelä considers a committee of principals who gather to vote whether or not to renew a fixed-term employment contract of an agent. The principals’ private preferences depend on the agent’s past performance and the voting outcome. She analyzed two scenarios: One where all communication is prohibited and the other where the principals engage in a pre-vote deliberation. She characterizes the set of symmetric, responsive equilibria of the pure voting game and shows that informative voting constitutes an equilibrium whenever the number of votes required for the reappointment is sufficiently high. She then establishes that if the principals can communicate prior to casting the decisive ballots, truthful information sharing coincides with Nash equilibrium behavior. However, in contrast to the common conception, sometimes pre-vote deliberation may actually make the principals worse off. The underlying intuition is that with absent deliberation, the principals are unable to coordinate their votes, and this may force the agent to perform at a level beyond that in the game with communication.

In the sixth paper “Power Measures and Public Goods” Izabella Stach analyzes some power indices that are well-defined in the social context where goods are public. She considers the following indices: Public Help index θ , Public Help index ξ , the König and Bräuninger index, the Nevison index, and the Rae index. The aim of this paper is to compare several power indices, taking into account the various properties, rankings among players, and ranges over indices.

In the seventh paper entitled “Holdout Threats During Wage Bargaining” Ahmet Ozkardas and Agnieszka Rusinowska investigate a wage bargaining between a union and a firm where the parties’ preferences are expressed by varying discount rates and the threat of the union is to be on go-slow instead of striking. First, they describe the attitude of the union as hostile or altruistic where a hostile union is on go-slow in every disagreement period and an altruistic union never threatens the firm and holds out in every disagreement period. Then they derive subgame perfect equilibria of the bargaining when the union’s attitude is determined exogenously. Furthermore, they determine the necessary conditions for the equilibrium extreme payoffs of both parties independently of the union’s attitude and calculate the extreme payoffs for a particular case when the firm is at least as patient as the union.

The eighth paper entitled “Index of Implicit Power as a Measure of Reciprocal Ownership” by Jacek Mercik and Krzysztof Lobos is devoted to the problem of complex power indices. The multitude of existing forms of business organizations (e.g., limited liability company, private partnership, joint stock company, etc.) and the possibilities of relationships and interactions between them call for the need to recognize individual components of these forms as elements influencing the group

decision-making process. Among many possible ways to assess this impact are so-called power indexes, including the implicit index proposed by the authors that may serve as a measurement of power in reciprocal ownership structures.

In the ninth paper “Manipulability of Voting Procedures: Strategic Voting and Strategic Nomination” by Frantisek Turnovec, the concepts of manipulation as strategic voting (misrepresentation of true preferences) and strategic nomination (by adding or removing alternatives) are investigated. The connection between Arrow’s and Gibbard–Satterthwaite theorems is discussed from the viewpoint of a dilemma between dictatorship and manipulability.

The tenth paper entitled “Reflections on the Significance of Misrepresenting Preferences” is written by Hannu Nurmi. The paper deals with the concept of manipulation, understood as preference misrepresentation, in light of the main theoretical results focusing on their practical significance. It also reviews some indices measuring the degree of manipulability of choice functions. Moreover, the results on complexity of manipulation as well as on safe manipulability are briefly touched upon.

The 11th paper is the joint work of Vito Fragnelli, Gianfranco Gambarelli, Nicola Gnocchi, Flavio Pressacco, and Laura Ziani. The paper is entitled “Fibonacci Representations of Homogeneous Weighted Majority Games.” Isbell (1956) introduced a class of homogeneous weighted majority games based on the Fibonacci sequence. In the paper, they generalize this approach to other homogeneous representations of weighted majority games in a suitable Fibonacci framework. They also provide some properties of such representations.

The 12th paper “The Core for Games with Cooperation Structure” is written by Ines Gallego, Michel Grabisch, Andres Jimenez-Losada, and Alexandre Skoda. A cooperative game consists of a set of players and a characteristic function that determines the maximal profit or minimal cost that each subset of players can get when they decide to cooperate, regardless of the actions of the rest of players. The relationships among the players can modify their bargaining and therefore their payoffs. The model of cooperation structures in a game introduces a graph on the set of players setting their relations and in which its components indicate the groups of players that are initially formed. In this paper the authors define the core and the Weber set and the notion of convexity for this family of games.

The 13th paper entitled “Towards a Fairness-Oriented Approach to Consensus Reaching Support Under Fuzzy Preferences and a Fuzzy Majority via Linguistic Summaries” is written by Janusz Kacprzyk and Sławomir Zadrozny and is devoted to a novel approach to a human-centric support of a consensus-reaching process in a group of agents who present their testimonies as individual fuzzy preference relations. The concept of a degree of consensus is used that is meant as the degree to which, for instance, most important agents agree as to almost all relevant options. The fuzzy majorities are equated with linguistic quantifiers and Zadeh’s calculus of linguistically quantified propositions is used. The new concepts of a consensory and dissensory agent is introduced. The authors’ approach of using linguistic data summaries for a comprehensive summarization of how the agents’ current testimonies look like is then employed for the consensory and dissensory agents to obtain suggestions to the agents on changes of specific preferences that could lead to a higher degree of consensus.

The last paper is an invited paper entitled “What Is It That Drives Dynamics: We Don’t Believe in Ghosts, Do We?” authored by Jan Treur. Dynamics has puzzled researchers since long ago. Among them are Greek philosophers such as Zeno of Elea and Aristotle. They pointed at the phenomenon that the world occurs to us in different states at different points in time. However, for the transition from a given physical state to another physical state, it is not always clear from the given physical state what will be different in the next state. For example, Zeno and Aristotle argue that at one specific instant in the physical world (a snapshot) a moving arrow cannot be distinguished from an arrow at rest, yet the next state for a moving arrow is different. What is it in this given state that is driving the change to a next state in one case but that apparently is absent in the other case? When no physical property can be found in the given original physical state that can explain this change, what other entity can there be to explain the change? Usually an entity that is not part of physical reality, and therefore cannot be sensed in any way, but still may bring about changes in the physical world, is called a ghost. If for a transition from a given physical state nothing physical can be found in this state that can explain what will be different in the next state, then it may seem that this change has to be attributed to a ghost or ghost-like entity or property in the original state.

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