Report from Dagstuhl Seminar 21331

Coalition Formation Games

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Abstract

There are many situations in which individuals will choose to act as a group, or coalition. Examples include social clubs, political parties, partnership formation, and legislative voting. Coalition formation games are a class of cooperative games where the aim is to partition a set of agents into coalitions, according to some criteria, such as coalitional stability or maximization of social welfare. In our seminar we discussed applications, results, and new directions of research in the field of coalition formation games.

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1 Executive Summary

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As mentioned, coalition formation games occur in many real-world settings. We are particularly interested in a subclass of coalition formation games, hedonic games, which were first proposed by Drèze and Greenberg [1] and later formalized by Banerjee et al. [2] and Bogomolnaia and Jackson [3]. Hedonic games are distinguished from general coalition formation games by the requirement that each agent's utility is wholly derived from the members of their own coalition.

This Dagstuhl Seminar brought multiple approaches and viewpoints to the study of coalition formation games, and in particular hedonic games, mainly from the perspective of computer science and economics. Particular topics that were discussed in talks and working groups include:

- succinctly representable preferences over coalitions;
- evolving preferences;
- the existence and verification of stable coalition structures (for various stability concepts);

- the computational complexity of finding or verifying stable or optimal partitions, or even determining whether such partitions exist;
- designing (if possible, efficient) algorithms for finding stable or optimal (or nearly so) coalition structures, or for verifying that a coalition structure is (nearly) stable or optimal;
- stability notions restricted to social networks or other networks;
- matching markets and matching under preferences, and their relation to hedonic games;
- dynamics of coalition formation;
- and group activity selection.

The overarching theme of this Dagstuhl Seminar was to bring together different communities working in coalition formation and hedonic games from various perspectives in computer science and economics and to bridge and bundle their research activities.

Much of the great atmosphere of the seminars at Schloss Dagstuhl comes from informal meetings besides the official schedule, with participants doing leisure activities together and enjoying other joint undertakings – this is, by the way, coalition formation in practice. Owing to the hybrid mode and pandemic-related restrictions, it was unfortunately not possible for us to organize group activities with all participants. However, due to the great technical support at Schloss Dagstuhl, the participants – online and on site – were able to take part in talks, discussions and working groups interactively to explore some of the challenging open questions of the field.

The organizers thank all participants for interesting talks and discussions. We also thank Schloss Dagstuhl for the technical preparation and support that made this hybrid seminar possible.

References

1 Dreze, Jacques H and Greenberg, Joseph. *Hedonic Coalitions: Optimality and Stability*. Econometrica: Journal of the Econometric Society (1980): 987-1003.

2 Banerjee, Suryapratim, Hideo Konishi, and Tayfun Sönmez. *Core in a Simple Coalition Formation Game*. Social Choice and Welfare 18.1 (2001): 135-153.

3 Bogomolnaia, Anna, and Matthew O. Jackson. *The Stability of Hedonic Coalition Structures*. Games and Economic Behavior 38.2 (2002): 201-230.

2 Table of Contents

Working groups

3 Overview of Talks

3.1 Bribery and Control in Stable Marriage

Niclas Boehmer (TU Berlin, DE)

Joint work of Niclas Boehmer, Robert Bredereck, Klaus Heeger, Rolf Niedermeier
Main reference Niclas Boehmer, Robert Bredereck, Klaus Heeger, Rolf Niedermeier: "Bribery and Control in Stable Marriage," Journal of Artificial Intelligence Research, 71:993–1048, 2021.
URL https://doi.org/10.1613/jair.1.12755

We initiate the study of external manipulations in Stable Marriage by considering several manipulative actions as well as several manipulation goals. For instance, one goal is to make sure that a given pair of agents is matched in a stable solution, and this may be achieved by the manipulative action of reordering some agents' preference lists. We present a comprehensive study of the computational complexity of all problems arising in this way. We find several polynomial-time solvable cases as well as NP-hard ones. For the NP-hard cases, focusing on the natural parameter "budget" (that is, the number of manipulative actions one is allowed to perform), we also conduct a parameterized complexity analysis and encounter mostly parameterized hardness results.

3.2 Hedonic Games with Deviation Rules as Solution Concepts

Grégory Bonnet (Caen University, FR)

Joint work of Grégory Bonnet, Thibaut Vallée

In hedonic games, solution concepts are considered as global characterization on how co-operation should be. However, we may want to model agents which have different notions of cooperation: egoistic agents, altruistic agents, etc. Thus, we propose a model of hedonic games, called deviation games, where agents locally define their own solution concept based on a set of individual constraints. These rules may be composed to express classical solution concepts, but may also highlight new kinds of solution concepts.

3.3 Group Activity Selection (on Social Networks): Progress or Theoretical Exercise?

Robert Bredereck (HU Berlin, DE)

In the Group Activity Selection Problem, players form coalitions to participate in activities and have preferences over pairs of the form (activity, group size) and the goal is to find a Nash (resp. core, individually, etc.) stable assignment of the players to the activities. In the Group Activity Selection with social networks players can further only engage in the same activity if the members of the group form a connected subset of the underlying communication structure. Athough being motivated and initiated by Dagstuhl seminar participants trying to solve real-world group activity selection, the model received a lot of theoretical attention but never returned into practice. In my talk, calling for a real-world implementation, I review some of the challanges and discuss possible next steps.

3.4 Dynamics Based on Single-Agent Stability in Hedonic Games

Martin Bullinger (TU München, DE)

Joint work of Felix Brandt, Martin Bullinger, Leo Tappe, Anaelle Wilczynski
Main reference Felix Brandt, Martin Bullinger, Anaëlle Wilczynski: "Reaching Individually Stable Coalition Structures in Hedonic Games", in Proc. of the Thirty-Fifth AAAI Conference on Artificial Intelligence, AAAI 2021, Thirty-Third Conference on Innovative Applications of Artificial Intelligence, IAAI 2021, The Eleventh Symposium on Educational Advances in Artificial Intelligence, EAAI 2021, Virtual Event, February 2-9, 2021, pp. 5211–5218, AAAI Press, 2021.
URL https://ojs.aaai.org/index.php/AAAI/article/view/16658

The formal study of coalition formation in multiagent systems is typically realized using so-called hedonic games, which originate from economic theory. The main focus of this branch of research has been on the existence and the computational complexity of deciding the existence of coalition structures that satisfy various stability criteria. The actual process of forming coalitions based on individual behavior has received considerably less attention. In this talk, we study the convergence of simple dynamics based on single-agent deviations in hedonic games. We consider various strategies for proving convergence of the dynamics based on potential functions. In particular, we showcase methods for dealing with non-monotonic potential functions. On the other hand, it is a challenging task to pinpoint the boundary of tractability of stable states. We show how to construct complicated counterexamples with the aid of linear programs. These counterexamples can usually be used to prove computational intractabilities.

3.5 Testing Stability Properties in Graphical Hedonic Games

Hendrik Fichtenberger (Universität Wien, AT) and Anja Rey (Universität Köln, DE)

Main reference Hendrik Fichtenberger, Anja Rey: "Testing stability properties in graphical hedonic games", Auton. Agents Multi Agent Syst., Vol. 35(2), p. 26, 2021.
URL http://dx.doi.org/10.1007/s10458-021-09505-x

In hedonic games, players form coalitions based on individual preferences over the group of players they could belong to. Several concepts to describe the stability of coalition structures in a game have been proposed and analysed in the literature. However, prior research focuses on algorithms with time complexity that is at least linear in the input size. In the light of very large games that arise from, e.g., social networks and advertising, we initiate the study of sublinear time property testing algorithms for existence and verification problems under several notions of coalition stability in a model of hedonic games represented by graphs with bounded degree. In graph property testing, one shall decide whether a given input has a property (e.g., a game admits a stable coalition structure) or is far from it, i.e., one has to modify at least an ϵ-fraction of the input (e.g., the game's preferences) to make it have the property. In particular, we consider verification of perfection, individual rationality, Nash stability, (contractual) individual stability, and core stability. While there is always a Nash-stable coalition structure (which also implies individually stable coalitions), we show that the existence of a perfect coalition structure is not tautological but can be tested. All our testers have one-sided error and time complexity that is independent of the input size.

3.6 Fair Ride Allocation on a Line

Ayumi Igarashi (National Institute of Informatics – Tokyo, JP)

Joint work of Yuki Amano, Yasushi Kawase, Kazuhisa Makino, Hirotaka Ono

The airport game is a classical and well-known model of fair cost-sharing for a single facility among multiple agents. This paper extends it to the so-called assignment setting, that is, for multiple facilities and agents, each agent chooses a facility to use and shares the cost with the other agents. Such a situation can be often seen in sharing economy, such as sharing fees for office desks among workers, taxis among customers of possibly different destinations on a line, and so on. Our model is regarded as a coalition formation game based on the fair cost-sharing of the airport game; we call our model *a fair ride allocation on a line.* As criteria of solution concepts, we incorporate Nash stability and envy-freeness into our setting. We show that a Nash-stable feasible allocation that minimizes the social cost of agents can be computed efficiently if a feasible allocation exists. For envy-freeness, we provide several structural properties of envy-free allocations. Based on these, we design efficient algorithms for finding an envy-free allocation when at least one of (1) the number of facilities, (2) the capacity of facilities, and (3) the number of agent types, is small. Moreover, we show that a consecutive envy-free allocation can be computed in polynomial time. On the negative front, we show the NP-hardness of determining the existence of an allocation under two relaxed envy-free concepts.

3.7 The Impact of Tolerance in Schelling Games

Panagiotis Kanellopoulos (University of Essex – Colchester, GB)

Joint work of Panagiotis Kanellopoulos, Maria Kyropoulou, Alexandros A. Voudouris
Main reference Panagiotis Kanellopoulos, Maria Kyropoulou, Alexandros A. Voudouris: "Not all Strangers are the Same: The Impact of Tolerance in Schelling Games", CoRR, Vol. abs/2105.02699, 2021.
URL https://arxiv.org/abs/2105.02699

Schelling's famous model of segregation assumes agents of different types, who would like to be located in neighborhoods having at least a certain fraction of agents of the same type. We consider natural generalizations that allow for the possibility of agents being tolerant towards other agents, even if they are not of the same type. In particular, we consider an ordering of the types, and make the realistic assumption that the agents are in principle more tolerant towards agents of types that are closer to their own according to the ordering. Based on this, we study the strategic games induced when the agents aim to maximize their utility, for a variety of tolerance levels. We provide a collection of results about the existence of equilibria, and their quality in terms of social welfare.

3.8 Stable Partitions for Proportional Generalized Claims Problems

Bettina Klaus (University of Lausanne, CH)

Joint work of Bettina Klaus and Oihande Gallo

We consider a set of agents, e.g., a group of researchers, who have claims on an endowment, e.g., a research budget from a national science foundation. The research budget is not large enough to cover all claims. Agents can form coalitions and coalitional funding is proportional to the sum of the claims of its members, except for singleton coalitions which do not receive any funding. We analyze the structure of stable partitions when coalition members use well-behaved rules to allocate coalitional endowments, e.g., the well-known constrained equal awards rule (CEA) or the constrained equal losses rule (CEL).

For continuous, (strictly) resource monotonic, and consistent rules, stable partitions with (mostly) pairwise coalitions emerge. For CEA and CEL we provide algorithms to construct such a stable pairwise partition. While for CEL the resulting stable pairwise partition is assortative and sequentially matches lowest claims pairs, for CEA the resulting stable pairwise partition is obtained sequentially by matching in each step either a highest claims pair or a highest-lowest claims pair.

More generally, we can also assume that the minimal coalition size to have a positive endowment is $\theta \geq 2$. We then show how all results described above are extended to this general case.

3.9 Strict Core and Strategy-Proofness for Hedonic Games with Friend-Oriented Preferences

Bettina Klaus (University of Lausanne, CH) and Seckin Özbilen (University of Lausanne, CH)

Joint work of Bettina Klaus, Flip Klijn, Seckin Özbilen

We consider hedonic coalition formation problems with friend-oriented preferences; that is, each agent has preferences over coalitions she is part of based on a partition of the set of other agents into friends and enemies. We assume that for each of her coalitions, (1) adding an enemy makes her strictly worse off, (2) adding a friend together with a set of enemies makes her strictly better off, and (3) adding a friend makes her strictly better off than losing a set of enemies. We show that the partition associated with the strongly connected components (SCC) of the so-called friend-oriented preference graph is in the strict core. The SCC mechanism, which assigns the SCC partition to each hedonic coalition formation problem with friend-oriented preferences, is group strategy-proof. Furthermore, the SCC mechanism is the only mechanism that satisfies strategy-proofness and strict core stability.

3.10 Coalition Formation Games Span All of Social Choice! Towards a taxonomy.

Jérôme Lang (CNRS – Paris, FR)

I suggested to design a "Sandewallian" taxonomy for coalition formation problems, that turns out to specialize into hedonic games but also resource allocation, various forms of matching, group activity selection, peer selection, and voting. I presented a first step towards this taxonomy.

3.11 Tiered Coalition Formation Games with Extensions

Nathan Arnold (University of Kentucky – Lexington, US) and Judy Goldsmith (University of Kentucky – Lexington, US)

Joint work of Nathan Arnold, Judy Goldsmith, Sarah Snider

In 2017, Cory Siler proposed Tiered Coalition Formation Games, a structure that allows a simple, transitive representation for complicated, intransitive hierarchies of power. This CFG was inspired by a real-world approach for capturing the hierarchy of power in the Pokemon series of video games, and includes a preference framework in which Nash stability and core stability are equivalent. A stable partition is guaranteed to exist for any instance and was found by Siler in polynomial time, but an open problem remained of how to find a partition that is useful in real-world applications of the problem.

Our work proposes a new algorithm, inspired by the game of rock-paper-scissors, and a notion of epsilon-stability for this problem, both of which extend Siler's work and allow us to find more practical partitions for a given instance.

References

1 Cory Siler. *Tiered Coalition Formation Games.* The Thirtieth International FLAIRS Conference, 2017

3.12 Anchored Team Formation Games

Jacob Schlueter (Kyushu University – Fukuoka, JP), Chris Addington (University of Kentucky – Lexington, US), and Judy Goldsmith (University of Kentucky – Lexington, US)

Main reference Jacob Schlueter, Christian Addington, Judy Goldsmith: "Anchored Team Formation Games", in Proc. of the Thirty-Fourth International Florida Artificial Intelligence Research Society Conference, North Miami Beach, Florida, USA, May 17-19, 2021, 2021.
URL http://dx.doi.org/10.32473/flairs.v34i1.128501

We propose Anchored Team Formation Games (ATFGs), a new class of hedonic game inspired by tabletop role playing games. We establish the NP-hardness of determining whether Nash stable coalition structures exist, and provide results for three heuristics for this problem.

We highlight costs and benefits of each heuristic and provide evidence that all three are capable of finding Nash stable coalition structures, when they exist, much more quickly than a deterministic algorithm.

3.13 Team Counter-Selection Games

Matthew Spradling (University of Michigan – Flint, US)

Joint work of Dawson Crane, Zachary Holmes, Taylor Tadziu Kosiara, Michael Nickels, Matthew Spradling
Main reference Dawson Crane, Zachary Holmes, Taylor Tadziu Kosiara, Michael Nickels, and Matthew Spradling: "Team Counter-Selection Games". In IEEE Conference on Games 2021.
URL https://ieee-cog.org/2021/assets/papers/paper_192.pdf

We model team-versus-team contests with limited team size and an open pool of team member candidates. In this setting, candidates with a higher win rate against the open pool may be considered the "meta". Simply selecting the meta candidates leaves the team open to be countered by off-meta candidates which have lower overall win rates but high win rates against the meta in particular. A central authority in this model selects team members in hopes to counter the team composition they believe will be selected by an opponent. We present algorithms that generate a team of candidates based on observed metas and given that both parties have knowledge of pairwise election battle wins of the usable candidate pool. We provide different methodology to generate teams and analyze the teams generated by our algorithms using Pokémon GO team compositions to test them.

3.14 Housing Markets over Social Networks

Taiki Todo (Kyushu University – Fukuoka, JP) and Makoto Yokoo (Kyushu University – Fukuoka, JP)

Joint work of Takehiro Kawasaki, Ryoji Wada, Taiki Todo, Makoto Yokoo
Main reference Takehiro Kawasaki, Ryoji Wada, Taiki Todo, Makoto Yokoo: "Mechanism Design for Housing Markets over Social Networks", in Proc. of the AAMAS '21: 20th International Conference on Autonomous Agents and Multiagent Systems, Virtual Event, United Kingdom, May 3-7, 2021, pp. 692–700, ACM, 2021.
URL https://dl.acm.org/doi/10.5555/3463952.3464036

We investigate the effect of an underlying social network over agents in a well-known multi-agent resource allocation problem; the housing market. We first show that, when a housing market takes place over a social network with more than two agents and these agents have an option to avoid forwarding information about it to their followers, there does not exist an exchange mechanism that simultaneously satisfies strategy-proofness, Pareto efficiency, and individual rationality. It is also impossible to find a strategy-proof exchange mechanism that always chooses an outcome in a weakened core. These results highlight the difficulty of taking into account the agents' incentive of information diffusion in the resource allocation. To overcome these negative results, we consider two different ways of restricting the problem; limiting the domain of preferences and the structure of social networks.

3.15 Coalition Structure Generation Using Concise Characteristic Function Prepresentation

Makoto Yokoo (Kyushu University – Fukuoka, JP)

Main reference Vincent Conitzer, Tuomas Sandholm: "Complexity of constructing solutions in the core based on synergies among coalitions", Artif. Intell., Vol. 170(6-7), pp. 607–619, 2006.
URL http://dx.doi.org/10.1016/j.artint.2006.01.005
Main reference Xiaotie Deng, Christos H. Papadimitriou: "On the Complexity of Cooperative Solution Concepts", Math. Oper. Res., Vol. 19(2), pp. 257–266, 1994.
URL http://dx.doi.org/10.1287/moor.19.2.257
Main reference Pragnesh Jay Modi, Wei-Min Shen, Milind Tambe, Makoto Yokoo: "An asynchronous complete method for distributed constraint optimization", in Proc. of the The Second International Joint Conference on Autonomous Agents & Multiagent Systems, AAMAS 2003, July 14-18, 2003, Melbourne, Victoria, Australia, Proceedings, pp. 161–168, ACM, 2003.
URL http://dx.doi.org/10.1145/860575.860602
Main reference Naoki Ohta, Vincent Conitzer, Ryo Ichimura, Yuko Sakurai, Atsushi Iwasaki, Makoto Yokoo: "Coalition Structure Generation Utilizing Compact Characteristic Function Representations", in Proc. of the Principles and Practice of Constraint Programming – CP 2009, 15th International Conference, CP 2009, Lisbon, Portugal, September 20-24, 2009, Proceedings, Lecture Notes in Computer Science, Vol. 5732, pp. 623–638, Springer, 2009.
URL http://dx.doi.org/10.1007/978-3-642-04244-7_49
Main reference Suguru Ueda, Atsushi Iwasaki, Makoto Yokoo, Marius-Calin Silaghi, Katsutoshi Hirayama, Toshihiro Matsui: "Coalition Structure Generation based on Distributed Constraint Optimization", in Proc. of the Twenty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2010, Atlanta, Georgia, USA, July 11-15, 2010, AAAI Press, 2010.
URL http://www.aaai.org/ocs/index.php/AAAI/AAAI10/paper/view/1809

Forming effective coalitions is a major research challenge in AI and multi-agent systems. coalition Structure Generation problem (CSG) involves partitioning a set of agents into coalitions to maximize social surplus. Traditionally, the input of the CSG problem is a black-box function called a characteristic function, which takes a coalition as input and returns the value of the coalition. As a result, applying constraint optimization techniques to this problem has been infeasible. However, characteristic functions that appear in practice often can be represented concisely by a set of rules, rather than treating the function as a black box. Then we can solve the CSG problem more efficiently by directly applying constraint optimization techniques to this compact representation. In this talk, I introduce several representative representations, i.e., graphical representations, synergy coalition group, an distributed constraint optimization problem, and describe how to solve CSG based on these representations.

3.16 Providing Good Model Explanations – a Call to Arms

Yair Zick (University of Massachusetts – Amherst, US)

In this talk, I present some of the ideas at the heart of model explainability, and their deep connections to ideas in cooperative game theory. In the past five years, several cooperative game theoretic solution concepts – and the Shapley value in particular – have been used extensively by the machine-learning community to explain the decisions of black-box models. Papers on the topic regularly appear in flagship ML conferences such as ICML and NeurIPS. However, the cooperative game-theory community has, by and large, remained somewhat uninvolved in this important development. The objective of this talk is to present some of the formal ideas underlying the generation of explanations for black-box machine-learning models, and how they map to game-theoretic solution concepts. We will cover other important criteria such as explanation privacy and fairness, and how they can inform our analysis of classic cooperative game-theoretic domains.

4 Working groups

4.1 Empathy in Dynamic Coalition Formation

Martin Bullinger (TU München, DE)

Joint work of Niclas Boehmer, Florian Brandl, Martin Bullinger, Grégory Bonnet, Edith Elkind, Anna Maria Kerkmann, Bettina Klaus, Seckin Özbilen, Sanjukta Roy

In research on stability in coalition formation, it is commonly assumed that preferences of agents over coalition structures are fixed and given a priori. The main task is then to identify stable states under various notions of stability. A weakness of such models is that they are only capable to capture a static model of coalition formation, where interaction of agents in coalitions plays no further role. In this working group, we study dynamics of coalition formation where single agents perform deviations based on incentives caused by instablities which may evolve over time. In particular, we seek to model aspects of empathy that cause agents to alter their preferences based on the evolution of new coalition structures. These encompass for instance laziness of agents to alter a status quo, or the emergence of friendships.

4.2 Hedonic Games under Evolving Preferences

Paul Harrenstein (University of Oxford, GB)

Joint work of Haris Aziz, Andreas Darmann, Hendrik Fichtenberger, Abheek Ghosh, Judy Goldsmith, Paul Harrenstein, Ayumi Igarashi, Joanna Kaczmarek, Micheal McKay, Anja Rey, Anaëlle Wilczynski, Gerhard Woeginger, Makoto Yokoo

Hedonic games provide a simple and versatile, but static framework to analyse coalition formation from a game-theoretic point of view. Its focus is on the formation of a single coalition structure. Coalition formation, however, is not a one-shot event. Rather, coalitions are formed repeatedly over time. The working group explored the possible directions in which to extend the formal framework of hedonic games to a temporal setting wherein players may evolving preferences over which coalitions to belong to and what would be appropriate dynamic solution and stability concepts. We expect our investigations also to have repercussions for compact representations of preferences, mechanism design, and the computational complexity surrounding this setting.

A first main question is how to model players' preferences over how coalitions change over time. We distinguished three types of temporal preferences:

T1. Sequences of $\vec{R}_i = R_i^0 R_i^1 R_i^2 \dots$ of static preferences over coalition structures. E.g.: *The first couple of years I prefer to be with these colleagues in a research group, then a couple of years with these, and after that with this group, etcetera.*

T2. Functions $\vec{R}_i$ mapping each *history* $\pi_1 \ldots \pi_t$ of coalition structures to a static preference relation $\vec{R}_i(\pi_1, \ldots, \pi_t)$. E.g., *I want to be in the same research group at least three years in a row, but prefer to move to a group at Harvard after having been four years in the same group.*

T3. Preference relations $\vec{R}_i \subseteq \vec{\Pi} \times \vec{\Pi}$ over coalition sequences. E.g.: *I want to be at a research group in Oxford infinitely often and at Cambridge at least once.*

Each of these types of preferences has its merits, depending on the situation one wishes to model. In our first effort to investigate how static stability concepts can be extended to such that take the dynamic structure into account, we focussed on T3 preferences. Drawing inspiration from the work of Kadam and Kodowski [1] on multi-period matching, we were able to define a dynamic concept of stability for hedonic games with evolving preferences.

References

1 S. V. Kadam and M. H. Kotowski,. *Multiperiod Matching.* Int. Economic Review 59(4): 1927–1947, 1998

4.3 Towards a Coalition Formation Card Game

Jérôme Lang (CNRS – Paris, FR) and Christian Laußmann (Heinrich-Heine-Universität Düsseldorf, DE)

Joint work of Florian Brandl, Robert Bredereck, Piotr Faliszewski, Paul Harrenstein, Shiri Heffetz, Jérôme Lang, Christian Laußmann

We started to design a card game based on additive hedonic games. Players (ideally, between 6 and 15) draw cards that indicate a positive or negative utility for a player, which they will get if they end up in the same coalition as this player. We experienced that the game becomes significantly more interesting if the players draw additional cards from time to time rather than knowing all utilities from the start. We want to further develop the game and finally test it in experiments. Our hope is to get a better understanding on how people act in such games compared to theoretically proposed (or optimal) strategies.

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