

Collaborative decision systems in economics and in complex societal and environmental applications

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The EURO Mini-Conference on “Collaborative Decision Systems in Economics and in Complex Societal and Environmental Applications” took place from October 17 through 19, 2013 in Graz, Austria (<https://eurominiconferencegraz2013.wordpress.com/>). It was organized by the EURO Working Groups of DSS, E-CUBE, MCSP and ORAFM together with the main organizers Dr. Fátima C.C. Dargam, Prof. Dr. Stefan Pickl and Prof. Dr. Ulrike Leopold–Wildburger. Prof. Leopold–Wildburger is the head of the Institute of Statistics and Operations Research at the University of Graz, which managed the local organization.¹

The conference’s purpose was to bring together researchers in the areas of Decision Support Systems, Operations Research, Methodology of Societal Complexity, Experimental Economics, and their respective areas of applications. These researchers shared and discussed their own and their respective disciplines’ different approaches during the conference. The conference focused on the problem of decision-making and its relation to societal, economic, and environmental contexts. The conference

¹ Note that the guest editors of this special issue also are contributors. In the case of these manuscripts, they were not in any way part of the editorial or review process, ensuring normal handling and anonymous peer-review.

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thus addressed a broad and complex topic. To do so, it was organized in four streams, namely the Stream of Decision Support Systems, the Stream of Experimental Economics, the Stream of Complex Societal Problems, and the Stream of Operations Research in Agriculture and Forest Management. Finally, the conference was crowned by seven special talks, given by Jakob Krarup (University of Copenhagen), Rudolf Vetschera (University of Vienna), Rita A. Ribeiro (UNINOVA), Cor van Dijkum (Utrecht University), Marion Sabine Rauner (University of Vienna), Ljusk Ola Erikson (Swedish University of Agricultural Sciences), and Hermann Maurer (Graz University of Technology).

On the occasion of this conference, the Central European Journal of Operations Research (<http://www.springer.com/business+%26+management/operations+research/journal/10100>) invited submissions of papers for a special issue on “Collaborative Decision Systems in Economics and in Complex Societal and Environmental Applications”. The interdisciplinary nature of the conference is mirrored in the contributions assembled in this special issue. The topics range from the field of economics, like experimental markets and auctions, via vehicle routing problems and the classification of image databases to broader topics like social norms and the diffusion of innovations. The articles were broadly grouped based on the method employed: a survey, followed by empirical studies using experiments, and finally simulation and similar approaches.

This issue is opened by Rasmußen (2015), who provides a comprehensive review of behavioral studies on honest and dishonest reporting in both management accounting research and behavioral economics. The author finds that classical decision theory is unable to account for the behavioral results. As a response to this, the article identifies a trend to incorporate social preference theories and especially preferences for honesty in study designs in an endeavor to gain a deeper understanding of information misreporting.

In this special issue’s first study applying experimental methodology, Rausch and Brauneis (2015) investigate how decision-support personnel decides on which pieces of information to provide to decision-makers in order to aid their decision-making process. They report that inclusion and exclusion of information are non-complementary, and that accountability increases the diligence of support personnel.

Bota et al. (2015) present a case study of applying the General Cascade framework of infection modelling to the problem of predicting corporate bankruptcies in a bank credit portfolio context. They show that this approach outperforms the more common scorecard-based methodology.

Hornung et al. (2015) observe perfectly and imperfectly informed traders interact in experimental asset markets characterized by three different mechanisms of regulating the market opening. Their findings yield valuable insights into better-informed traders’ strategies of hiding their informational advantage, and into the advantages and disadvantages of different market opening mechanisms.

The contribution of Füllbrunn et al. (2015) explores the effect of a fallback option on the valuation of a good using a second-price auction. Such an option—in effect a second-best solution in case the bidder does not win the good being auctioned—is frequently present in business decisions. Füllbrunn et al. (2015) show that their

experimental subjects do not fully account for the presence and value of a fallback option.

Fleiß (2015) presents the results of an experiment studying the acceptance of equality norms and meritocratic norms in an ultimatum game. The article extends the work of Hoffmann et al. (1994) by implementing the strategy method to measure the decisions of responders. The author shows that meritocratic norms—introduced in the form of letting subjects earn the role of proposer by winning a knowledge quiz—are not only accepted by those who profit from them but also by those whose payoff is lower than under an equality norm.

Hu et al. (2015) combine a system dynamics model with experiments to investigate how to control opportunistic behavior by private-sector suppliers in public–private partnerships. In their web experiment, they show that carefully designed contracts can help keep projects on schedule, implying low delay penalties, and thus benefitting both principals and agents.

Zhang et al. (2015) investigate the role of pay inequity in an individual's job performance. Distinguishing between “inequality”, “envy”, and “altruism”, they uncover and describe the complex and non-linear relationship between pay inequity, context variables, and job performance in empirical firm data.

Mehmood and Maurer (2015) present an application of information integration algorithms for image databases. They show how their approach succeeds in making the wealth of information in one area of today's IKT industry manageable using automated classification and processing based on various pieces of metadata.

Sonderegger-Wakolbinger and Stummer (2015) propose a novel agent-based simulation approach for analyzing the impact of multi-channel activities by firms. Considering the heterogeneity of customers, social dynamics in their behavior, and the various phases of the purchasing process, they illustrate the strengths of this approach.

Senarclens de Grancy and Reimann (2015) tackle the problem of optimizing transportation and distribution of goods, inspired by the soft drink industry's problem of distributing their goods to a large number of smaller retailers in Brazilian cities. They provide a comparison of how well this task is solved by the popular ant colony optimization algorithm to how well it is solved by a greedy randomized adaptive search procedure in a vehicle routing problem including time windows and multiple service workers. They find that ant colony optimization provides better solutions for their scenario.

Zsifkovits and Günther (2015) conclude this special issue with a study on the role of resistance factors in innovation diffusion. They argue that previous approaches, which modelled a single resistance factor, are exposed to a pro-innovation bias. Applying an agent-based simulation approach to a case study of hydrogen vehicles, they show that considering multiple innovation resistance factors can reduce this bias.

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