

06461 Abstracts Collection
Negotiation and Market Engineering
— **Dagstuhl Seminar** —

Nicholas R. Jennings¹, Gregory Kersten², Axel Ockenfels³ and Christof
Weinhardt⁴

¹ Univ. of Southampton, GB

nrj@ecs.soton.ac.uk

² Concordia University - Montreal, CA

gregory@jmsb.concordia.ca

³ Univ.Köln, DE

ockenfels@uni-koeln.de

⁴ Univ. Karlsruhe, DE

weinhardt@iw.uni-karlsruhe.de

Abstract. From 12.11.06 to 17.11.06, the Dagstuhl Seminar 06461 “Negotiation and Market Engineering” was held in the International Conference and Research Center (IBFI), Schloss Dagstuhl. During the seminar, several participants presented their current research, and ongoing work and open problems were discussed. Abstracts of the presentations given during the seminar as well as abstracts of seminar results and ideas are put together in this paper. The first section describes the seminar topics and goals in general. Links to extended abstracts or full papers are provided, if available.

Keywords. Negotiations, Auctions, Decision Support Systems, Software Agents, Testbedding Markets

06461 Executive Summary – Negotiation an Market Engineering

This executive summary sketches the overall theme of the seminar held from November 12 to 17, 2006, at Schloss Dagstuhl.

Keywords: Negotiations, Auctions, Decision Support Systems, Software Agents, Testbedding Markets

Joint work of: Jennings, Nicholas R.; Kersten, Gregory; Ockenfels, Axel; Weinhardt, Christof

Extended Abstract: <http://drops.dagstuhl.de/opus/volltexte/2007/1010>

A Decision Support System for Market Mechanisms Choice in e-Procurement

Carsten Block (Universität Karlsruhe (TH), D)

Since the rise of the Internet electronic markets have become an important component of e-procurement by bringing together demand and supply. E-markets are meeting venues for component suppliers and purchasers, who use exchange mechanisms to electronically support the procurement process. Exchange mechanisms can be conceived as market institutions providing sets of rules, which determine the functioning of the market and the permissible actions such as bidding deadlines, non-disclosure rules or bid-revocation constraints. In nowadays procurement landscape, mechanisms vary from electronic procurement catalogues, where requests and offers are publicly announced, to e-negotiations, where the participants bargain over the conditions of a trade using electronic message exchange and / or decision support platforms, to auctions, where one or two sides automate the process during which participants from the other side compete against each other (Kersten, Neumann, Vahidov, & Chen, 2006). The variety of procurement solutions already suggests that there is no single best solution for all imaginable sourcing activities. Instead, some mechanisms like e.g. an auction might be advantageous in certain situations while others are not (and vice versa).

In this paper we present a knowledge-based system (KMS) aimed at supporting procurement staff in their decision making on which mechanism to choose best for a specific sourcing scenario.

Keywords: Negotiation, electronic auction, e-auction, decision support, DSS, strategic sourcing, SRM, procurement, knowledge base, expert system

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/989>

Nonlinear Transaction Pricing in the Securities Trading Value Chain

Matthias Burghardt (Universität Karlsruhe (TH), D)

Most of the research on transaction costs in the market microstructure literature focuses on implicit transaction costs. Research on the design of price schedules for explicit transaction fees is rare. This paper analyzes and classifies different price schedules and discusses their application to the market transaction business. The discussion highlights design issues and the need for a structured approach for price schedule design in the context of market engineering.

In order to get some insights into customer order behavior, we conduct a trading experiment where participants trade virtual stocks on an electronic platform within a time period of three weeks. During three weeks, participants face

transaction fees of different types. Order frequency and volume is measured and related to the price schedule in place. We find that both variables are influenced by transaction fees. We also try to identify price elasticities for groups with different income and use this information for a structured approach towards a nonlinear price schedule design.

Keywords: Nonlinear Pricing, Securities Trading, Exchanges, Transaction Fee Experiment

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/990>

A Comparison Between Mechanisms for Sequential Compute Resource Auctions

Andrew Byde (HP Lab - Bristol, GB)

This paper describes simulations designed to test the relative efficiency of two different sequential auction mechanisms for allocating compute resources between users in a shared data-center. Specifically we model the environment of a data center dedicated to CGI rendering in which animators delegate responsibility for acquiring adequate compute resources to bidding agents that autonomously bid on their behalf. For each of two possible auction types we apply a genetic algorithm to a broad class of bidding strategies to determine a near-optimal bidding strategy for a specified auction type, and use statistics of the performance of these strategies to determine the most suitable auction type for this domain.

Keywords: Auction resource allocation

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/991>

Negotiation or Auction? The NorA project

Eva Chen, Bo Yu and Klaus Kolitz (Concordia University - Montreal, CA / Universität Karlsruhe (TH), D)

NorA is a joint project between Concordia University, Canada, and University Karlsruhe, Germany, through which a group of researchers of Auction and Negotiation meet together in order to deeply investigate the differences and possible impacts of the use of different electronic market mechanisms. The objective of the project is to build a comprehensive research framework and knowledge base from multiple discipline perspectives (e.g. economics, behavioral science, psychology, information system (IS) research, computer science, etc), through continuous and accumulative work. The research under this project would bring valuable knowledge and support to businesses, helping them to do better decision in transactions, especially in the cyberspace (Malone et al., 1987), whereby the appropriate use of electronic market transaction system and mechanisms would further increase social welfare and better satisfy agents with the transaction process if possible (Smith, 1982).

Keywords: Negotiation, auction, mechanism, and markets

Extended Abstract: <http://drops.dagstuhl.de/opus/volltexte/2007/992>

Optimal Bidding Strategies for Simultaneous Vickrey Auctions with Perfect Substitutes

Enrico H. Gerding, Rajdeep K. Dash, David C. K. Yuen and Nicholas R. Jennings (University of Southampton, GB)

We derive optimal bidding strategies for a global bidder who participates in multiple, simultaneous second-price auctions with perfect substitutes. We first consider a model where all other bidders are local and participate in a single auction. For this case, we prove that, assuming free disposal, the global bidder should always place non-zero bids in all available auctions, irrespective of the local bidders' valuation distribution. Furthermore, for non-decreasing valuation distributions, we prove that the problem of finding the optimal bids reduces to two dimensions. These results hold both in the case where the number of local bidders is known and when this number is determined by a Poisson distribution. In addition, by combining analytical and simulation results, we demonstrate that similar results hold in the case of several global bidders, provided that the market consists of both global and local bidders. Finally, we address the efficiency of the overall market, and show that information about the number of local bidders is an important determinant for the way in which a global bidder affects efficiency.

Keywords: Simultaneous Auctions, Perfect Substitutes, Bidding Strategies, Vickrey Auction, Multiple Sellers, Market Efficiency

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/993>

Full Paper:

<http://www.ecs.soton.ac.uk/~rkd/publications/2006/aamas06.enrico.pdf>

Designing Reverse Auctions for B2B Procurement - Evidence from the German Industry

Tilman Eichstädt (Universität Rostock, D)

For a long time on-line reverse auctions have been proposed as an effective tool to improve the performance of corporate procurement. Five years after the end of the Internet and e-business hype, reverse auctions have become a standard procurement tool for large corporations. However, it has not been assessed as yet to what extent users actively apply the findings of auction theory to improve the design of reverse auctions. Based on a representative survey of companies using procurement auctions in Germany, the following paper reveals which auction

designs are used in practice and to what extent more complex and sophisticated auction designs are adopted. By comparing the empirical results with the concepts of auction theory it is shown which levers can be pulled to improve the design of an auction. For auctions with many bidders, hybrid auctions seem to be promising as they can reasonably combine the benefits of different standard auction models. For auctions with only a few bidders, Dutch auctions might be superior to English auctions as they can create additional uncertainty and induce risk-averse bidders to bid more aggressively. In practice, however, it is very common that companies use different variations of the English auction such as rank or best/not best auctions rather than Dutch or hybrid auctions. Here it seems that framing effects rather than game-theoretic factors play an important role.

Keywords: Auctions, auction design, procurement, hybrid auctions, framing effects

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/994>

Sequential versus Simultaneous Auctions: A Case Study

Shaheen Fatima (University of Liverpool, GB)

Sequential and simultaneous auctions are two important mechanisms for buying and selling multiple objects. These two mechanisms yield different outcomes (i.e., different surpluses, different revenues, and also different profits to the winning bidders). Given this, we compare the outcomes for the sequential and simultaneous mechanisms for the following scenario. There are multiple similar objects for sale, each object is sold in a separate auction, and each bidder needs only one object. Furthermore, each object has both common and private value components and bidders are uncertain about these values. We first determine the equilibrium bidding strategies for each individual auction for the simultaneous and sequential cases. We do this for the English auction rules, the first-price sealed bid rules, and the second-price sealed bid rules. We then consider the case where the private and common values have a uniform distribution and compare the two mechanisms in terms of a bidder's ex-ante expected profit, the auctioneer's expected cumulative revenue, and the expected cumulative surplus. Our study shows that, for all the three auction rules, the expected cumulative surplus and the auctioneer's expected cumulative revenue is higher for the sequential mechanism. However, the mechanism that generates a higher ex-ante expected profit for the bidders depends on the number of objects being auctioned and the number of participating bidders, and it is sometimes higher for sequential mechanism and sometimes for the simultaneous one.

Keywords: Multi-object auctions, interdependent valuations, sequential auctions, simultaneous auctions

Full Paper:

<http://www.csc.liv.ac.uk/~shaheen/pubs/icec06.pdf>

Payoff levels, loss avoidance, and equilibrium selection in the Stag Hunt: an experimental study

Nicholas Feltovich, Atsushi Iwasaki and Sobei H. Oda (University of Houston, USA / Kyushu University, Japan / Kyoto Sangyo University, Japan)

Game theorists typically assume that changing a game's payoff levels—by adding the same constant to, or subtracting it from, all payoffs—should not affect behavior. However, this invariance is an empirical question when "payoffs" are actually money amounts rather than utility amounts. In particular, if individuals treat gains and losses differently, then payoff-level changes may matter when they result in positive payoffs becoming negative, or vice versa. We report the results of a human-subjects experiment designed to test for two types of "loss avoidance": certain-loss avoidance (avoiding a strategy leading to a sure loss, in favor of an alternative that might lead to a gain) and possible-loss avoidance (avoiding a strategy leading to a possible loss, in favor of an alternative that leads to a sure gain). Subjects in the experiment play three versions of a game called Stag Hunt, which are identical up to the level of payoffs, under a variety of treatments. We find differences in behavior across the three games; these differences are hard to detect in the first round of play, but grow over time. When significant, the differences we find are in the direction predicted by certain- and possible-loss avoidance. Our results carry implications for games with multiple equilibria, and for theories that attempt to select equilibria in such games.

Keywords: Experiment, game theory, behavioral economics, stag hunt, learning

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/996>

Sellers Competing for Buyers in Online Markets

Enrico H. Gerding, Alex Rogers, Rajdeep K. Dash and Nicholas R. Jennings (University of Southampton, GB)

We consider competition between sellers offering similar items in concurrent online auctions, where each seller must set its individual auction parameters (such as the reserve price) in such a way as to attract buyers. We show that there exists a pure Nash equilibrium in the case of two sellers with asymmetric production costs. In addition, we show that, rather than setting a reserve price, a seller can further improve its utility by shill bidding (i.e., pretending to be a buyer in order to bid in its own auction). But, using an evolutionary simulation, we show that this shill bidding introduces inefficiencies within the market. However, we then go on to show that these inefficiencies can be reduced when the mediating auction institution uses appropriate auction fees that deter sellers from submitting shill bids.

Keywords: Auctions, Competing Sellers, Shill Bidding, Auction Fees, Reserve Price

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/997>

Negotiation Fever: Loss Aversion in Multi-Issue Negotiations

Henner Gimpel (Universität Karlsruhe (TH), D)

Negotiating parties oftentimes do not reach mutually beneficial agreements. A considerable body of research on negotiation analysis compiled a set of so called common biases in negotiations that systematically affect the cognition and behavior of negotiators and thereby influence agreements. The present work adds an additional effect, the attachment effect. This effect biases decision makers in bilateral multi-issue negotiations and influences their preferences via reference points—negotiators get caught in a kind of negotiation fever.

Keywords: Negotiation Analysis, Consumer Preferences, Behavioral Economics, Experimental Economics, Endowment Effect, Loss Aversion

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/998>

A Bayesian Reputation System for Virtual Organizations

Jochen Haller (SAP Research, D)

Virtual Organizations (VOs) are an emerging business model in today's Internet economy. Increased specialization and focusing on an organization's core competencies requires such novel models to address business opportunities. In a VO, a set of sovereign, geographically dispersed organizations temporarily pool their resources to jointly address a business opportunity. The decision making process determining which potential partners are invited to join the VO is crucial with respect to entire VO's success. The possibility of a VO partner performing badly during the VO's operational phase or announcing bankruptcy endangers the investment taken in integrating their processes and infrastructure for the purpose of the VO. A reputation system can provide additional decision support besides the a priori knowledge from quotations and bidding to avoid events such as VO partner replacement by helping to choose reliable partners in the first place. To achieve this, reputation, an objective trust measure, is optimally aggregated from multiple independent trust sources that inherently characterize an organization's reliability. To allow for the desired predictions of an organization's future performance, a stochastic modeling approach is chosen. The paper will present a taxonomy of TIs for VO environments, a stochastic model to maintain and aggregate trust sources, so called Trust Indicators, and the inclusion of other subjective measures such as feedback.

Keywords: Reputation system, Bayes network, trust management, virtual organisations

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/999>

On Comparison of Mechanisms of Economic and Social Exchanges: The Times Model

Gregory Kersten, Eva Chen, Dirk Neumann, Rustam Vahidov and Christof Weinhardt (Concordia University - Montreal, CA / Universität Karlsruhe (TH), D)

An e-market system is a concrete implementation of a market institution; it embeds one or more exchange mechanisms. The mechanisms are from the economic point of view disembodied objects (models and procedures) which control access to and regulate execution of transactions. E-market systems are also information systems which are information and communication technologies artifacts. They interact with their users; have different features and tools for searching, processing and displaying information. This work puts forward an argument that the study of e-markets must incorporate both the behavioural economic as well as the information systems perspectives. To this end the paper proposes a conceptual framework that integrates the two. This framework is used to formulate a model, which incorporates the essential features of exchange mechanisms, as well as their implementations as IS artefacts. The focus of attention is on two classes of mechanisms, namely auctions and negotiations. They both may serve the same purpose and their various types have been embedded in many e-market systems.

Keywords: Electronic markets, information systems, exchange mechanisms, auctions, negotiations, system assessment

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1000>

Three Decision-making Mechanisms to facilitate Negotiation of Service Level Agreements for Web Service Compositions

Jakub Brzostowski, Mohan Baruwal Chhetri, Ryszard Kowalczyk (Swinburne Univ. - Melbourne, AU)

The negotiation of Service Level Agreements for composite web services is a very complex process. It involves the coordination of the negotiation process so that the end-to-end QoS requirements of the user request are satisfied while ensuring that the atomic QoS requirements are also simultaneously satisfied. This paper summarizes three decision-making mechanisms which support the process of Service Level Agreement negotiation for composite web services. The

mechanisms include: the decomposition of the overall user preferences into the preferences of individual negotiation agents representing each atomic services within the composition; the selection of the prospective negotiation partners for the actual interaction from a list of potential service providers and finally the negotiation of Service Level Agreement with the selected provider agents while ensuring that the end-to-end QoS is satisfied.

Keywords: negotiation, end-to-end QoS, composite web services

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1001>

Prediction Markets: How Do Incentive Schemes Affect Prediction Accuracy?

Stefan Luckner (Universität Karlsruhe (TH), D)

The results of recent studies on prediction markets are encouraging. Prior experience demonstrates that markets with different incentive schemes predicted uncertain future events at a remarkable accuracy. In this paper, we study the impact of different monetary incentives on the prediction accuracy in a field experiment. In order to do so, we compare three groups of users, corresponding to three treatments with different incentive schemes, in a prediction market for the FIFA World Cup 2006. Somewhat surprisingly, our results show that performance-compatible payment does not necessarily increase the prediction accuracy.

Keywords: Prediction Markets, Incentive Engineering

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1002>

Decentralization and Mechanism Design for Online Machine Scheduling

Birgit Heydenreich, Rudolf Müller and Marx Uetz (Maastricht University, NL)

We study the online version of the classical parallel machine scheduling problem to minimize the total weighted completion time from a new perspective: We assume that the data of each job, namely its release date r_j , its processing time p_j and its weight w_j is only known to the job itself, but not to the system. Furthermore, we assume a decentralized setting where jobs choose the machine on which they want to be processed themselves.

We study this problem from the perspective of algorithmic mechanism design. We introduce the concept of a myopic best response equilibrium, a concept weaker than the dominant strategy equilibrium, but appropriate for online problems. We present a polynomial time, online scheduling mechanism that, assuming rational behavior of jobs, results in an equilibrium schedule that is

3.281-competitive. The mechanism deploys an online payment scheme that induces rational jobs to truthfully report their private data. We also show that the underlying local scheduling policy cannot be extended to a mechanism where truthful reports constitute a dominant strategy equilibrium.

Keywords: Scheduling, mechanism design, online algorithms

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1003>

See also: Published in Algorithm Theory, Springer Lecture Notes Vol. 4059, pp 136-147, 2006

Engineering Grid Markets

Dirk Neumann (Universität Karlsruhe, D)

Grids denote a promising concept to pool computer resources for joint computations. Facing increasingly more complex and demanding resources, Grids are deemed the solution to those problems by a more efficient and flexible usage of already existing resources. From a technical perspective Grid middleware have made significant progress. While in former implementations it was only possible to share idle resources (e.g. using Condor), new Grid middleware allow advance reservation of resources that are once committed not usable locally for the committed time (e.g. GRAM in Globus Toolkit 4.0). Advance reservation thus allows the sharing of not only idle resources but of all designated resources.

The contribution of this paper is threefold. Firstly, this paper derives a requirement list stemming from Grid applications that need to be fulfilled by the market-based Grid. Secondly, the paper compares related work with the above requirements. Thirdly, and most importantly, this paper provides a fully-fledged market mechanism that is tailored to the use in service-oriented Grids.

Keywords: Market Engineering, Grid Computing, Combinatorial Exchange

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1004>

On the Design of Simple Multi-unit Online Auctions

Thomas Kittsteiner, Axel Ockenfels (London School of Economics, GB / Universität Köln, D)

The increased use of online market places (like eBay) by professional traders and small businesses goes along with an increase in demand for online multi-unit auction designs. A seller with many objects for sale might consider it inconvenient to initiate and monitor a single auction for each individual item and thus might favour the use of a multi-unit auction. However, the design of online multi-unit auctions can be substantially more difficult than that of single-unit auctions.

In fact, the theoretical as well as empirical literature on multi-unit auctions is much less developed. New difficulties such as market power and computational complexities arise when objects are heterogeneous or bidders demand multiple items. In addition, there is a conflict between simplicity of auction rules and their efficiency (and revenue). If objects for sale are complements, to obtain the optimal performance (at least from a theoretical point of view) the auction design usually requires that bidders specify their preferences on any possible package of the N objects. Thus each bidder has to submit $2^N - 1$ numbers (as he might value any subset of the items for sale differently). Especially for a large number of objects such an auction is often infeasible.

Multi-unit auction design is considerably simpler if one can assume that each bidder just demands one object (or, more generally, if objects are substitutes). As we will argue below, under this unit-demand assumption, the standard single-unit auction format used on eBay can be naturally extended to a multi-unit design.

In what follows we will first describe the single-unit auction format used by eBay and then demonstrate how it can be adjusted to allow for the simultaneous sale of many objects. We will discuss some of the drawbacks of this multi-unit design and offer another simple design that can circumvent some of these.

Keywords: Multi-Unit Auctions, Internet Auctions, Market Engineering, eBay

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1005>

The Effects of Discrete Bid Levels in Online Auctions

Alex Rogers (University of Southampton, GB)

A key feature of real world auctions that is often neglected in their analysis is that bids are either restricted to certain discrete levels or a finite minimum bid increment is enforced. In this talk we describe the effects that these implementation details have on the properties of the auction, and in general, we show that they cause an auction to contravene the Wilson doctrine (i.e. that auction mechanisms should be detail-free). Thus, an auctioneer attempting to maximise its revenue must tailor the auction design to fit the environment in which it finds itself. We show how an auctioneer can do so by inferring properties of the bidders that can not be directly observed (e.g. their valuation distribution) through observations of previous auctions. We then go on to consider how these implementation details also affect bidders behaviour, and most specifically, the phenomenon of sniping in eBay auctions.

References

- David, E., Rogers, A., Schiff, J., Kraus, S., Rothkopf, M. and Jennings, N. R. (2007) Optimal Design Of English Auctions With Discrete Bid Levels. ACM Transactions on Internet Technology.

- Rogers, A., David, E., Schiff, J. and Jennings, N. R. (2007) The Effects of Proxy Bidding and Minimum Bid Increments within eBay Auctions. ACM Transactions on the Web.
- Rogers, A., David, E., Schiff, J., Kraus, S. and Jennings, N. R. (2005) Learning Environmental Parameters For The Design Of Optimal English Auctions With Discrete Bid Levels, in La Poutré, H., Sadeh, N. and Sverker, J. (Eds.) Agent-mediated Electronic Commerce, Designing Trading Agents and Mechanisms: AAMAS 2005 Workshop, AMEC 2005, Utrecht, Netherlands, July 25, 2005, and IJCAI 2005 Workshop, TADA 2005, Edinburgh, UK, August 1, 2005, Selected and Revised Papers, pp. 1-15. Springer.

Keywords: Auctions, discrete bid, eBay, sniping, optimal

Towards Generic Low Payment Mechanisms for Decentralized Task Allocation, a Learning Based Approach

Amir Ronen and Rina Talisman (Technion - Haifa, IL)

We study the problem of procuring a cheap path in a disjoint path graph in which the edges belong to self interested agents. A wide range of task allocation problems can be reduced to this problem [?]. Motivated by recent negative results regarding incentive compatible mechanisms for the problem, our focus is on non incentive compatible mechanisms. Such mechanisms have both good and bad equilibria and therefore it is not clear how to analyze them.

We take first steps towards the construction of generic low payment mechanisms for task allocation. We focus on simple mechanisms conveying minimal amount of information to the agents. By simulation, we investigate the behavior of the agents during repeated executions of the mechanism. We study three adaptive strategies for the agents, each represents a different learning approach. Our goal is to pinpoint phenomena which are consistent across all three types of strategies.

We demonstrate that it may be possible to achieve long range payments overwhelmingly smaller than the payments of incentive compatible mechanisms. Several recommendations which facilitate obtaining low payments along with advises for avoiding pitfalls are given as well. We then give a partial theoretical explanation of the phenomena we are witnessing in the experiments by analyzing a related random process.

Keywords: Mechanism design, low payment, procurement mechanisms, game theory, reinforcement learning

Full Paper:

<http://iew3.technion.ac.il/~amirr/talismanRonen.pdf>

Experimental research on bilateral negotiation

Jesus Ríos, Stefan Strecker, JinBeak Kim, Simone Ludwig and Eva Chen (Concordia University - Montreal, CA)

Two hundred undergraduate and graduate students from the two English universities in Montreal participated in our experiments. Subjects participated in a contract negotiation between an artist and an entertainment company. They negotiated as representatives of the respective sides. The contract was comprised of 4 fixed issues to negotiate: number of promotional concerts, number of new songs, royalties for CDs and contract signing bonus. Each issue had a fixed number of options to choose from. A complete offer consists of selecting one option per issue. In total, there were 240 possible contracts. The experiments were conducted in a lab setting in which the interaction between the negotiation parties was computer-mediated via a web browser. Each dyad had one hour to negotiate a contract by exchanging messages and complete offers for acceptance. Participants were also asked to fill in a pre and post negotiation questionnaire. Each participant was paid \$24 cash for a 3 hours session.

Keywords: Negotiations, decision support

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1006>

MACE: A Multi-Attribute Combinatorial Exchange

Björn Schnizler (Universität Karlsruhe (TH), D)

The Grid is a promising technology for providing access to distributed high-end computational capabilities. Thus, computational tasks can be performed spontaneously by other resources in the Grid that are not under the user's control. However, one of the key problems in the Grid is deciding which jobs are to be allocated to which resources at what time. In this context, the use of market mechanisms for scheduling and allocating Grid resources is a promising approach toward solving these problems. This paper proposes an auction mechanism for allocating and scheduling computer resources such as processors or storage space which have multiple quality attributes. The mechanism is evaluated according to its economic and computational performance as well as its practical applicability by means of a simulation.

Keywords: Auctions and Bidding, Integer Programming, Combinatorial Exchange, Market Engineering, Grid

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/1009>

Adopting Agent-Based Situated Decision Support Framework for Managing One-to-many Negotiations with Multiple Potential Agreements

Rustam Vahidov (Concordia University - Montreal, CA)

Much effort has been spent in the design and evaluation of agent solutions to automate one-to-one negotiations. Recently, researchers have been expanding the agent-based models to address bi-lateral negotiations as well. In this work our interest is in one-to-many negotiations involving multiple potential agreements. This may involve selling products or services to customers through deal-making. The work aims at applying the framework for situated decision support developed recently to this problem. The major components of situated decision support system include sensors, effectors, manager, and active user interface. We illustrate the approach through simulations for the case used previously in our agent-assisted negotiation experiments.

Keywords: Agent technology, one-to-many negotiations, situated decision support

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/987>

Market Engineering: An Interdisciplinary Research Challenge

Christof Weinhardt and Henner Gimpel (Universität Karlsruhe, D)

Market engineering is making markets work. Markets are information processing and information producing information systems which mediate allocation of resources within or between organizations. Setting up and operating a market in a way that it works effectively and efficiently is an art and a science. This paper outlines challenges in this interdisciplinary field of research and presents frameworks for assessing markets.

Keywords: Markets, Auctions, Negotiations, Economic Engineering, Market Engineering

Full Paper: <http://drops.dagstuhl.de/opus/volltexte/2007/988>