学术报告

**Auctions and Negotiations: Models, Systems, and Behavioral Studies**



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报告摘要：

Auctions have become one of the key transaction mechanisms used in all kinds of transactions conducted on the web. Information and communication technologies (ICT) also contributed to the emergence of various types of auctions, including multi-attribute and combinatorial forward and reverse auctions.

Surveys of the government and business procurement managers show that over 90 per cent of procurement managers base their decisions on both price and non-price attributes (e.g., terms of payment and delivery, durability, lead-time, warranty, and service). In the past, multi-attribute procurement decisions had been made through a sequence of bilateral negotiations; procurement managers negotiated with one supplier at a time and made a decision to award the contract or engaged in negotiation with another supplier. In the past, multi-bilateral negotiations were possible but difficult and time- and effort-consuming, while simultaneous multi-bilateral negotiations were not possible, albeit with a few exceptions.

Auctions’ efficiency, savings and the leverage of the competition, on the one hand, and need for multi-attribute procurement transactions, on the other hand, led to the design and implementation of multi-attribute reverse auctions (MARA). One shortcoming of most MARAs is that they rely on the quasi-linearity assumption that can be met for the goods that were produced prior to an auction but not for those that are produced after the auction is completed. In the latter cases, the relationship between the price and the costs causes that neither the transaction nor auction efficiency can be achieved. Our theoretical results have been verified empirically with the use of our Imaras web-based system (<http://invite.concordia.ca/imaras>) in which the patented mechanism that does not require disclosure of the buyer’s preferences is implemented; we found that when the efficient frontier is concave the bidders move away from the Nash-optimal solution.

Multi-bilateral negotiation (MBIN) is a mechanism that shares many similarities with MARA. ICT makes such negotiations not only a feasible but also a viable mechanism for organizations and consumers. We have designed and implemented MBIN system (<http://invite.concordia.ca/imbins>) and conducted multiple auctions and negotiation experiments. There are several interesting results of these studies, including the role and impact of concessions in auctions and negotiations, the impact of transparency on competition, and the efficiency of MARA and IMBIN mechanisms. One result of these behavioral studies is a two-phase MARA followed by MBIN mechanism which has the purpose is to combine the efficiency of auctions in terms of time and effort with the solution efficiency of decision-supported negotiations.

A related stream of research involves bilateral negotiations and the analysis of the negotiations conducted by human agents on behalf of their principals. We have designed and implemented the Inspire system (http://invite.concordia.ca/inspire) and conducted negotiations with participants from over 80 countries. The collected data was used to study cultural differences, impact of the interface, language and counterpart behavior. Most recently, we have conducted sentiment analysis and the principal impartation of preferences.

The analysis of the results from both MBIN and the bilateral negotiations led us to design software agents and employ them in human-agent negotiations.