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PRIVACY-PRESERVING AND TRUTHFUL ONLINE SPECTRUM ALLOCATION FOR BIDDING : A SURVEY

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Abstract: The notoriety of the Internet, the reconciliation administrations have slowly changed individuals everyday life, for example, web based business exercises on exchanges, transportation, etc. The E-sell off, one of the famous online business exercises, enables bidders to legitimately offer the items over the Internet. With respect to fixed offer, the additional exchange cost is required for the middle people in light of the fact that the outsider is the significant job between the purchasers and the merchants help to exchange both during the bartering. Bidders frequently feel tested when searching for the best offering techniques to exceed expectations in the focused condition of numerous and concurrent online sales for same or comparable things. Bidders face muddled issues for choosing which closeout to take part in, regardless of whether to offer early or late, and the amount to offer. In this framework, we present the plan of offering techniques which intend to conjecture the offer sums for purchasers at a specific minute in time dependent on their offering conduct and their valuation of an unloaded thing. The operator builds up an exhaustive philosophy for definite value estimation which structures offering techniques to address purchasers' distinctive offering practices utilizing two approaches: Mamdani strategy with Regression Analysis and Negotiation Decision Functions. The exploratory outcomes demonstrate that the operators who pursue dissuading relapse approach beat other existing specialists in many settings as far as their prosperity rate and anticipated utility. Like SCO device give most noteworthy need to utilizing rating for government contractual worker.

Keywords: — *E-auction, Public Bid, Sealed Bid, Smart Contract, Government Contract.*

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I INTRODUCTION

Advent of electronic commerce has dramatically advanced traditional trading mechanisms, and online auction settings like eBay and Amazon have been emerged as a powerful tool for allocating goods and resources. Discovery of the new markets and the possibilities opened by online trading has heightened the sellers' and buyers' interest. In online auction commerce, traders barter over products, applying specific trading rules over the web which support different auction formats. Common online auction formats are English, Dutch, First-price sealed bid and Second-price sealed-bid auctions Bidders in this marketplace face difficulties when looking for the best bidding strategies to win the auction. Moreover, there are commonly many auctions selling the desired item at a particular moment of time. Deciding which auction to participate in, whether to bid early or late, and how much to bid are very complicated issues for bidders. The difficult and time consuming processes of analysing, selecting and making bids and monitoring developments need to be automated in order to assist buyers with their bidding. The rise of programming operator innovation has made an imaginative system for creating on the web closeout components. As a result of their exceptional versatile abilities and trainability, programming operators have turned into a basic segment of web based exchanging frameworks for purchasing and selling merchandise. Programming operators can perform different errands like examining the present market to foresee future patterns, choosing offer sums at a specific minute in time, assessing diverse sale parameters and checking closeout progress, just as some more. These arranging specialists outflank their human partners in light of the efficient methodology they take to overseeing complex basic leadership circumstances adequately. This makes more open doors for master bidders and merchants to boost fulfillment and benefit.

II LITERATURE SURVEY

Online auctions have become a pervasive transaction mechanism for e-commerce. As the largest online marketplace in the world, eBay is an attractive case study that enables the study of online auctions utilizing data involving real people and transactions. In this paper, we present a detailed investigation and analysis of multiple online auction properties including: consumer surplus, sniping, bidding strategy and their cross relationships. Our goal is to evaluate the theoretical foundations of online auctions and discover patterns and behaviours hidden due to the lack of real and extensive transaction data. Among our findings, we uncover an important correlation among sniping and high surplus ratios, which implies the uncertainty of true value in a competitive environment. The key issue is the wrong assumption that bidder's valuations are independent from each other, which leads to inefficient auctions. In order to address the inefficiencies of current online formats we introduce a declining price auction model customized for online transactions. Conceptually, this model ought to deal with the complexities of competition in an online environment while maximizing social welfare. [1]

In recent years, the proliferation of the World Wide Web has lead to an increase in the number of public auctions on the internet. One of the characteristics of online auctions is that a successful implementation requires a high volume of buyers and sellers at its website. Consequently, auction sites which have a high volume of traffic have an advantage over those in which the volume is limited. This results in even greater polarization of buyers and sellers towards a particular site. This is often referred to as the network effect in a variety of web and telecommunication applications involving interactions among a large number of entities. While this effect has qualitatively been known to increase the value of the overall network, its effect has never been modelled or studied rigorously. In this paper, we construct a Markov Model to analyse the network effect in the case of web auctions. We show that the network effect is very powerful for the case of web auctions and can result in a situation in which one auction can quickly overwhelm its competing sites. This results in a situation in which the natural stable equilibrium is that of a single online auction seller for a given product and geographical locality. While a single player structure is unlikely because of some approximation assumptions in the model, the trend seems to show the likely existence of single dominant player in the web auction space. [2]

Academic interest in the popularity and success of online auctions has been increasing. Although much research has been carried out in an attempt to understand online auctions, little effort has been made to integrate the findings of previous research and evaluate the status of the research in this area. The objective of this study is to explore the intellectual development of consumer behaviour in online auction research through a meta-analysis of the published auction research. The findings of this study are based on an analysis of 83 articles on this topic published mainly in information systems (IS) journals between 1998 and 2007. The results indicate that the consumer behaviour research on online auctions can be categorized into three major areas facilitating factors, consumer behaviour and auction outcomes. Based on this literature review, directions for future research on eauction consumer behaviour are discussed, including potential new constructs, unexplored relationships and new definitions and measurements, and suggestions for methodological improvements are made. [3]

This study seeks to the answer the question of how an individual would trade off between listing fee (i.e., cost of listing an auction item) and transaction probability (i.e., the chance that a product will be sold). Applying the trade-off decision-making paradigm into the auction context, we examine a seller's choice of online auction outlet and subsequent starting price strategies when facing the trade-off between transaction probability and listing fee. Results from a set of laboratory experiments suggest that a seller would be willing to incur a high cost in exchange for a higher transaction prospect. Furthermore, if the expected transaction probability is high, a seller is more likely to set a high starting price despite incurring a high listing fee. The implications for theory and practice are discussed. [4]

Online auction is becoming more and more popular in electronic commerce (EC). It has become the mainstream trading methods in consumer to consumer (C2C), such as eBay. The steady collaboration field and common concept of exchange may be formed in the cooperation of the Multi-Agent system (MAS), and then the agents will have so much common knowledge in order to complete the tasks. The member of MAS has both cooperation and self-interest. Based on the analysis of the cooperation and competition of the participators in the online auction, the concept of overtime and history information is introduced. As existing incomplete information, the efficiency of the auction is low without consider the history information. This paper put forward a MAS flow frame and negotiation algorithms that make the bidders of the auction participate in the negotiation honestly and actively. Both the efficiency and transparency among the participators have been enhanced. [5]

III PROPOSED APPROACH

As shown in Fig. 1, our model consists of three parties: a set of bidders including sellers and buyers, an auctioneer and an auction agent. The auction agent, who cooperates with the auctioneer to facilitate the running of privacy-preserving auction mechanism, is introduced following existing literature [11], [12], [14], [15]. The agent and the auctioneer are both semihonest, meaning that they will faithfully follow the protocol, but attempt to learn information besides the output

[14]. Before the auction starts, the agent generates the key pair of Paillier cryptosystem [26]. Then, the auctioneer cooperates with the agent to determine the winners, clearing prices and allocated time-slots based on encrypted data received from bidders, and finally returns the auction results to bidders. We consider an online double auction for homogenous spectrum. Suppose there is a set S = {s1, s2, ..., sM} of M sellers, each of whom owns one channel to sublease during the time interval [0, T]. We assume that the channels are identical and the time is slotted (discrete). We use si to represent both the seller and her channel without confusion.
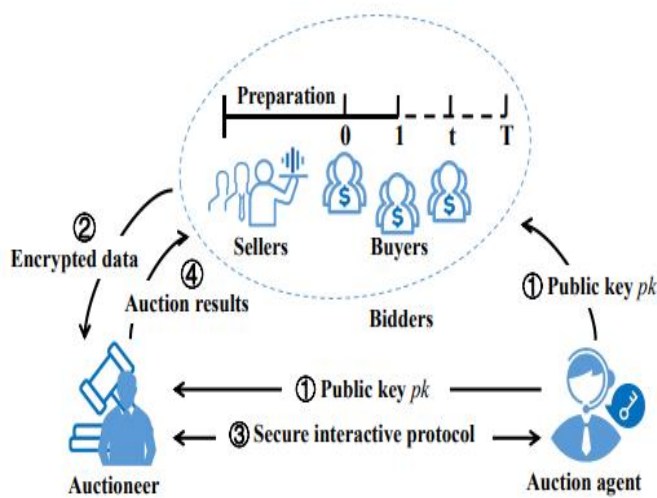

Figure 1. System Architecture

Let $v s_i$ denote the the fixed asking price of si for subleasing the channel for one time slot. Buyers arrive in an online fashion. Suppose there is a set B = {b1, b2, ..., bK} of K buyers coming at time t ($0 \le t < T$), each requesting for one channel. The request information of buyer bj is ($v b_j$, tb_j, x_j, y_j, r_j), in which $v b_j$ is the bid for one channel per time slot, $t b_j$ is the request of time-slots, (x_j, y_j) is the location, and r_j is the conflict radius. Conflictfree buyers can reuse the same channel simultaneously.

IV CONCLUSION

We have presented PROST, the first privacy preserving and truthful online double auction mechanism for spectrum allocation. PROST provides a comprehensive privacy protection for bidders, including bid values, bid ranking order, geo-location and time dynamics. PROST is constructed based on our carefully-designed security building blocks, which are well applicable in other spectrum auctions. We have conducted rigorous security analysis to prove that PROST is secure against semi-honest adversaries. The experimental results have demonstrated that PROST achieves strong privacy protection and nice spectrum allocation efficiency with light computation and communication costs.

REFERENCES

[1] X. Zhou, S. Gandhi, S. Suri, and H. Zheng, "eBay in the sky: Strategyproof wireless spectrum auctions," in Proc. of MOBICOM'08. ACM, 2008, pp. 2–13.

[2] P. Xu, X.-Y. Li, and S. Tang, "Efficient and strategyproof spectrum allocations in multichannel wireless networks," IEEE Transactions on Computers, vol. 60, no. 4, pp. 580–593, 2011.

[3] X. Feng, Y. Chen, J. Zhang, Q. Zhang, and B. Li, "TAHES: Truthful double auction for heterogeneous spectrums," IEEE Transactions on Wireless Communications, no. 11, pp. 3076–3080, 2012.

[4] M. Hoefer, T. Kesselheim, and B. Vocking, "Approximation algorithms ¨ for secondary spectrum auctions," ACM Transactions on Internet Technology, vol. 14, no. 2-3, p. 16, 2014.

[5] X. Zhou and H. Zheng, "TRUST: A general framework for truthful double spectrum auctions," in Proc. of INFOCOM'09. IEEE, 2009, pp. 999–1007.

[6] S. Wang, P. Xu, X. Xu, S. Tang, X. Li, and X. Liu, "TODA: Truthful online double auction for spectrum allocation in wireless networks," in Proc. of DySPAN'10. IEEE, 2010, pp. 1–10.

[7] P. Xu, X. Xu, S. Tang, and X.-Y. Li, "Truthful online spectrum allocation and auction in multi-channel wireless networks," in Proc. of INFOCOM'11. IEEE, 2011, pp. 26–30.

[8] P. Xu, S. Wang, and X.-Y. Li, "SALSA: Strategyproof online spectrum admissions for wireless networks," IEEE Transactions on Computers, vol. 59, no. 12, pp. 1691–1702, 2010.

[9] P. Xu and X.-Y. Li, "TOFU: Semi-truthful online frequency allocation mechanism for wireless networks," IEEE/ACM Transactions on Networking, vol. 19, no. 2, pp. 433–446, 2011.

[10] M. Pan, J. Sun, and Y. Fang, "Purging the back-room dealing: Secure spectrum auction leveraging paillier cryptosystem," IEEE Journal on Selected Areas in Communications, vol. 29, no. 4, pp. 866–876, 2011.

[11] Z. Chen, L. Huang, L. Li, W. Yang, H. Miao, M. Tian, and F. Wang, "PSTRUST: Provably secure solution for truthful double spectrum auctions," in Proc. of INFOCOM'14. IEEE, 2014, pp. 1249–1257.

[12] H. Huang, X. Li, Y. Sun, and H. Xu, "PPS: Privacy-preserving strategyproof social-efficient spectrum auction mechanisms," IEEE/ACM Transactions on Networking, vol. 26, no. 5, pp. 1393–1404, 2013.

[13] R. Zhu and K. G. Shin, "Differentially private and strategy-proof spectrum auction with approximate revenue maximization," in Proc. of INFOCOM'15. IEEE, 2015, pp. 918–926.

[14] F. Wu, Q. Huang, Y. Tao, and G. Chen, "Towards privacy preservation in strategy-proof spectrum auction

mechanisms for noncooperative wireless networks," IEEE/ACM Transactions on Networking, vol. 23, no. 4, pp. 1271–1285, 2015.

[15] Q. Huang, Y. Gui, F. Wu, and G. Chen, "A general privacy-preserving auction mechanism for secondary spectrum markets," IEEE/ACM Transactions on Networking, vol. 24, no. 3, pp. 1881–1893, 2015.

[16] Q. Wang, M. He, M. Du, S. S. M. Chow, R. W. F. Lai, and Q. Zou, "Searchable encryption over feature-rich data," IEEE Transactions on Dependable and Secure Computing, vol. 15, pp. 496–510, 2016.

[17] S. Hu, Q. Wang, J. Wang, Z. Qin, and K. Ren, "Securing sift: Privacy-preserving outsourcing computation of feature extractions over encrypted image data," IEEE Transactions on Image Processing, vol. 25, no. 7, pp. 3411–3425, 2016.

[18] Q. Wang, M. Du, X. Chen, Y. Chen, P. Zhou, X. Chen, and X. Huang, "Privacy-preserving collaborative model learning: The case of word vector training," IEEE Transactions on Knowledge and Data Engineering, vol. PP, pp. 1–1, DOI: 10.1109/TKDE.2018.2 819 673, 2018.

[19] Y. Chen, X. Yin, and J. Zhang, "A reverse auction framework for hybrid access in femtocell network," Journal of Computer Science and Technology, vol. 32, no. 6, pp. 1250–1264, 2017.

[20] Y. Chen, P. Lin, and Q. Zhang, "LOTUS: Location-aware online truthful double auction for dynamic spectrum access," in Proc. of DYSPAN'14. IEEE, pp. 510–518.