



ONLINE DOUBLE AUCTION FOR SPECTRUM ALLOCATION

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ABSTRACT:

Spectrum allocation is an effective way to distribute the spectrum resources. This allocation designs only target at economic robustness, while neglecting the inherent privacy leakage problem. Existing secure spectrum auction mechanisms fail to provide adequate security, and they all neglect the online fashion of spectrum request arrival. The first time, we propose a privacy-preserving and truthful online double auction mechanism for spectrum allocation in networks. It provides a comprehensive and strong protection for user's sensitive information, especially for location privacy and time dynamics. It is constructed based on carefully designed security building blocks, which support various arithmetic over encrypted real numbers. We improve on the existing online spectrum auction mechanisms by designing a novel privacy-preserving buyer grouping protocol for spectrum reuse, but also extensively evaluate its performance. The results are validate and achieves nice spectrum allocation efficiency with light computation and communication costs.

Keywords: wireless networks, spectrum, online allocation, double auction.

1.INTRODUCTION: Since the emergence of the World Wide Web (WWW), electronic commerce, commonly known as e-commerce, has become more and more popular. Websites such as eBay and Amazon allow internet users to buy and sell products and services online, which benefits every - one in terms of convenience and profit ability. The traditional online shopping business model allows sellers to sell a product or service at a preset price, where buyers can choose to purchase if they find it to be a good deal online auction however

is a different business model by which items are sold through price bidding. There is often a starting price and expiration time specified by the sellers. Once the auction starts, potential buyers bid against each other, and the winner gets the item with their highest winning bid. In auctions, truthfulness is one of the most critical properties. An auction without this property is extremely vulnerable to market manipulation and produces very poor outcomes, shown by both economic theory and concrete examples. Due to the fact that spectrum is fundamentally different from conventional goods as stated before, designing economic-robust double auctions for spectrum allocation is more challenging.

Spectrum assignment only considered single-sided spectrum auctions, which assume that primary users will always trust the central authority and be satisfied with the outcome of the auction. However, in practice, primary users are usually selfish and want to participate in the auction. So it is reasonable to design double auctions for spectrum allocation. Unfortunately, previous truthful double auction designs only consider the single-round case, which is not fit for the continuous spectrum auction where secondary users come in a stochastic way in an on-line fashion. There are also some projects focused on online double auctions, but they only focus on single item. In the case of spectrum allocation, we must consider requested time durations of secondary users, so this previous work cannot be directly used in double auctions for spectrum allocation. In present online matching algorithms whose competitive ratios depend on the spread in offer valuations. This earlier work does not consider incentive-compatibility, and is presented purely from an algorithmic perspective. The architecture is shown fig . 1

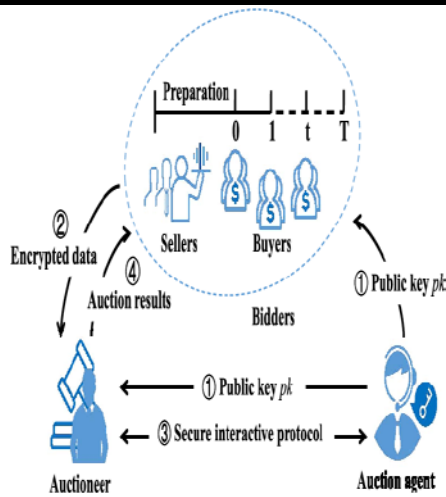


Fig 1: System Architecture

Fig1 shows proposed to the improvement on existing online spectrum auction mechanisms by designing a novel privacy-preserving buyer grouping protocol for spectrum reuse, not only theoretically proved. That can realize an all-round security against semi-honest adversaries, but also extensively evaluation of its performance.

2.EXISTING SYSTEM :

The traditional online shopping business model allows sellers to sell a product or service at a preset price, where buyers can choose to purchase if they find it to be a good deal. Online auction however is a different business model by which items are sold through price bidding. There is often a starting price and expiration time specified by the sellers. Once the auction starts, potential buyers bid against each other, and the winner gets the item with their highest winning.

3.PROPOSED SYSTEM

Our proposed system privacy-preserving and truthful online double auction mechanism for spectrum allocation in networks, it provides a comprehensive and strong protection for user's sensitive information, especially for location privacy and time dynamics. Consider the application of a proactive moderation system for fraud detection in a major Asian online auction site, where hundreds of thousands of new auction cases are created every day.

The moderation system for this site extracts rule-based features to make decisions. The rules are created by experts to represent the suspiciousness of sellers on fraudulence, and

the resulting features are often binary. For instance, we can create a binary feature (rule) from the ratings of sellers, i.e. the feature value is 1 if the rating of a seller is lower than a threshold (i.e. a new account without many previous buyers), otherwise it is 0.

By deploying such a moderation system, we are capable of selecting a subset of highly suspicious cases for further expert investigation while keeping their workload at a reasonable level. The moderation system using machine-learned models is proven to improve fraud detection significantly over the human tuned weights.

3.1 MODELS

3.1.1 Rule-Based Features:

Human experts with years of experience created many rules to detect whether a user is fraud or not. An example of such rules is "blacklist", i.e. whether the user has been detected or complained as fraud before. Each rule can be regarded as a binary feature that indicates the fraud likeliness.

3.1.2 Selective Labeling:

If the fraud score is above a certain threshold, the case will enter a queue for further investigation by human experts. Once it is reviewed, the final result will be labeled as boolean, i.e. fraud or clean. Cases with higher scores have higher priorities in the queue to be reviewed. The cases whose fraud score are below the threshold are determined as clean by the system without any human judgment.

3.1.3 Privacy-preserving and Truthful:

Once one case is labeled as provides privacy-preserving and truthful, it is very likely that the seller/buyer to provide trustable and may be also selling or buying activities and controlling other frauds, hence all the items submitted by the same seller are labeled as fraud too. The fraudulent seller along with his/her cases will be removed from the website immediately once detected.

3.1.4 User Complaint:

Buyers can file complaints to claim loss if they are recently deceived by fraudulent sellers. The Administrator view the various type of complaints and the percentage of various type complaints. The complaints values of a products increase some threshold value the administrator set the trust ability of the product as untrusted or banded. If the products set as

banded, the user cannot view the products in the website.

4. RESULTS: we designed mechanisms for online spectrum allocation and double auction when the spectrum channels for a period of time and many secondary users will bid for the usage in different time-slots. Under a simple assumption that the requests by secondary users arrive with Poisson distribution and the willing payment per time-slot is independent from the time-slot required, we prove that every secondary user will maximize its expected profit if it proposed requests truthfully. We also prove that our mechanism is individual rational for both primary users and secondary users and budget balanced for the central auctioneer. This is the first online spectrum allocation and double auction protocol with these properties. Good simulation protocols are performing. There are some questions are rising .First, we assume that the asking prices of the primary users is fixed during the double auction. However, the asking prices could be adaptive, for example, when the requests are less, the primary users would like to lower their asking price to sell more fraction of the spectrum

channels. Second, we assume that the request is not periodic. In practice, the requests of secondary users could be periodic. So how to design a truthful double auction mechanism to fit the period requests is a very interesting problem.

5. REFERENCES:

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