Good morning, Ladies and gentlemen, Today, my topic is diffusion auctions in social networks. This direction focuses on a realistic problem: how to promote a sale by social network. Now considering a scenario that you are going to sell a commodity, what can you do to increase your profit? Traditional approaches are as follows: promoting the product in a shopping center; contacting on-line sale platforms or using advertisements via social media like WeChat. However, the returns of all above methods are proved to be unpredictable, sometimes you would gain a pretty good revenue, sometimes you may get a terrible deficit. So how to design a new market mechanism to attract more people competing for the commodity while seller never loses becomes a problem. Recent years some scientists have studied on an auction design problem for selling an item in social networks.

First, I would like to illustrate basic settings for this problem, in this social network, people can only contact with their neighbors. Each individual taking part in the auction has her own action, submitting a price to the seller and propagating the sale information to her neighbors. Without diffusion seller could only get two dollars as profit while considering diffusion some high-bid agents could join in. However, all the bidders are in competition so that nobody is willing to invite a new competitor. Obviously, the vital challenge is to incent all agents in the auction diffusing the sale information to all her neighbors. Also, making the auction predictable and everybody’s participation are needed. So, the designed auction should be individual rational and incentive compatible which means everyone truthfully reports her valuation and diffuses the information to her neighbors will never suffer from monetary deficit and always maximize her utility. Well, it is proved the extension of classical VCG mechanism satisfying truthfulness but seller’s revenue could not be guaranteed. So, it does not work in this situation.

In order to deal with this issue, the information diffusion mechanism has been proposed. Core concepts of this novel algorithm are critical diffusion nodes and sequence. Intuitively, agent L could not participate in this auction without agent K, then we call K is J’s critical diffusion node. According to this definition we can find all the critical diffusion nodes of the highest price in this social network which construct the critical diffusion sequence: from seller to L. Based on the sequence, we assign the commodity to the first person whose bid is the highest when the next critical mode does not participate in the auction and the winner pays the highest bid without her participation. Also, all the winner’s critical diffusion nodes are rewarded the payment increase due to their diffusion. In this case, final winner is K and bidder C get rewarded. This mechanism can be rigorously proved satisfying all the properties mentioned earlier. Also, it promises higher revenue for the seller.

Diffusion auction is a new kind of auction which generalizes the classical auction into a social network setting. Recently, A framework of diffusion auction has been proposed these mechanisms encourage agents propagate information and increase all agents’ utilities. Considering different social network and extending this auction into multiple items and sponsor search auction will be future works.