

Diffusion Auction in Social Networks

Five Minutes Research Presentation

Introduction: How can you sell a commodity?

Traditional Approaches

- Contacting some on-line sales platform
- Using ads via some social media

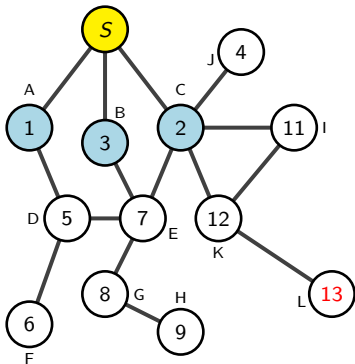
Challenge

- **Unpredictable** returns, suffer from **DEFICIT!**
- Attract more people while guarantee profits.



Selling a commodity via social network!

Diffusion Auction Settings

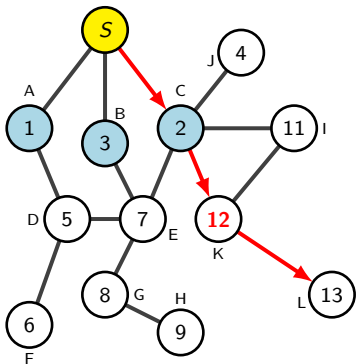


- Seller s sells a commodity.
- Having contact with neighbour nodes.
- (Without diffusion) Seller s sells the item among A,B,C.
- Competition \Rightarrow **Nobody diffuse!**



- **Target 1:** Encouraging Diffusion!
- **Target 2:** Encouraging Truthful Bid!

New Mechanism: Information Diffusion Mechanism



Final winner is **K**;
 Rewarded bidder: **C**.

- Critical Diffusion Nodes & Sequence.
- Allocation Rule:

$$\pi_i^{idm} = \begin{cases} 1 & i \in C_m \setminus \{m\}, v_i = v_{-d_{i+1}}^* \\ 1 & i = m \\ 0 & \text{otherwise} \end{cases}$$

- Payment Rule:

$$p_i^{idm} = \begin{cases} v_{-d_i}^* - v_{d_{i+1}}^* & i \in C_w \setminus \{w\} \\ v_{-d_i}^* & i = w \\ 0 & \text{otherwise} \end{cases}$$

- Truthful bid and propagation!

Conclusion And Discussion

Conclusions

- ① Generalizing classical auction into a social network.
- ② Encouraging bidders propagating sale information to neighbours.
- ③ Getting higher profit for both seller and bidders.

Future of Diffusion Auction

- ① Maximizing the seller's revenue.
- ② Considering different social networks' impacts.
- ③ Extending to multiple items auction.

Thanks for listening!