AAMAS2018: Notification for paper # 771

no-reply@confmaster.net <no-reply@confmaster.net> 25 January 2018 at 02:45
To: no-reply@confmaster.net
Cc: aamas@confmaster.net

Dear Authors,

We are pleased to inform you that your paper # 771 with the title: Cost-Free Advertising for Selling Multiple Items in Social Networks
has been accepted as a FULL PAPER for publication in the proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2018).

The review process was extremely selective. Out of the 597 submissions that were reviewed for the main track, the program committee selected 151 full papers (8 pages plus references) for oral presentation and 132 extended abstracts (2 pages plus references) for poster presentation.

The reviews of your paper are included below. In addition to the text of the (possibly revised) reviews that you have already seen, the reviews include some numerical scores (from 1 to 10), the review of the SPC member, and any additional reviews that were solicited during the discussion phase. Please be aware that the numerical scores are not always indicative. As you know, each PC and SPC member only saw a small subset of the overall submissions. In selecting the final program, the program chairs read through the detailed recommendations from the area chairs, SPC, and PC and made decisions based on the overall set of papers.

Though there will be no further review of your paper, in some cases the acceptance decision was influenced by the assumption that you would improve your paper according to the reviewer comments, or your rebuttal. As you prepare the final version of your paper, please take these issues into account in order to publish the best possible article.

Full papers are allowed 8 pages in the proceedings plus an unlimited number of pages containing *bibliographic references only*. In a later message we will provide you with the copyright and formatting instructions so that you can prepare and submit the final camera-ready version. For your paper to be published, at least one author must register for the conference and attend to present it. All accepted papers (both full papers and extended abstracts) will also be presented as posters. As a result, the poster sessions will be a very important part of the overall program and we look forward to having your poster there.

We are delighted to announce that we have funding for student travel support. The purpose is to enable full-time students at a higher education institution to travel and participate in the conference. If one of the authors of your paper is a student, please see this page for more information:
http://celweb.vuse.vanderbilt.edu/aamas18/studentTravel/
The deadline for applications is the 28th of February.

Note that the camera ready and early registration deadlines are over one month later than they are during a normal year when AAMAS occurs in May so you will have ample time to revise your paper

and make your travel arrangements. We will be in touch with you again in a couple of weeks with information about the camera-ready submission and registration deadlines.

Congratulations again and we look forward to seeing you at AAMAS 2018 this coming July in Stockholm!

Regards,
Mehdi Dastani and Gita Sukthankar
2018 AAMAS Program Chairs

Paper ID: 771
Title: Cost-Free Advertising for Selling Multiple Items in Social Networks

* Review *
- Full Paper Recommendation: 5
- Relevance: 7
- Novelty: 4
- Significance: 4
- Readability: 4
-Technical Quality: 7

- Comments to Authors :
Summary of the Paper
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The paper considers the problem of selling multiple units of an item on a social network market.
In particular, the market is constituted by a graph where one node is the seller of the item and other nodes are the buyers.
Communication in the network happens only among neighbouring nodes, hence the neighbours of the seller in the graph structure directly participate in the market.
Other buyers in the network can participate only if invited by participating nodes, who can advertise the sale to their neighbours.
In this setting, an additional challenge with respect to traditional auction problems is the fact that participating nodes
can not only misreport their value for the item, but can also chose not to invite in the market neighbouring nodes, if they can increase their utility by doing so.
Hence, an auction mechanism for this problem, besides eliciting from each agent their true value for the item
being sold, needs also incentivize the agents to invite their neighbouring nodes to the market.
Such a model has already been proposed by [8], where the problem of selling one unit of the item has been studied.
The authors of [8] proposed a mechanism, named Information Diffusion Mechanism (IDM), for solving the one-item-sale problem.
IMD is incentive compatible, individually rational, weakly budget-balanced and yields a higher revenue than
the VCG mechanism in social networks.
Solving the problem of selling multiple items is not trivial, since running multiple instances of the IDM mechanism
is not incentive compatible.

The authors hence propose GIDM, an extension of IDM to the case where multiple units of the same item need to be sold.
GIDM is proved to be incentive compatible, individually rational and to outperform the revenue that the seller can obtain
using VCG on a market comprising the neighbouring nodes of the seller (i.e., without advertising the sale to other nodes).

Justification for the Scores
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The problem is clearly stated, although some typos are present and the presentation can be improved.
The technical results seem sound and have some technical depth.
I think the problem is interesting, but I the contribution made in the paper is somwhat incremental with respect to [8].
Furthermore, assuming the agents do not incur in any cost for inviting other nodes to the market is somehow unrealistic.

Constructive Comments to Improve the Paper
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The model could be enriched by adding the cost of spreading information.
Adding a lower bound on the revenue obtainable by GIDM would strengthen the paper.

Questions for Rebuttal
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In [8] it is proved that VCG is IC for the one-unit selling problem.
This means that the agents are incentivized to advertise the sale and VCG is run on the whole set of buyers
Is VCG IC in the multiple-unit problem? I suppose it is not, but I could not find an answer to this question in the paper.
If VCG is IC, it would perhaps make sense to also compare the revenue generated by GIDM with the one
generated by VCG "in social network", as opposed to VCG run on the market comprising only the neighbours of the seller.

* Review *
- Full Paper Recommendation: 7
- Relevance: 7
- Novelty: 6
- Significance: 6
- Readability: 7
-Technical Quality: 8

- Comments to Authors :
The paper studies the revenue maximization problem faced by a seller in a graph (social network). The seller is one of the vertices in the graph, and the remaining nodes are all buyers. The seller's

visibility ends with his immediate neighborhood in the graph, and hence without further mechanisms to aid him the seller can just run an auction among his immediate neighbors. The goal for the seller is to recruit additional buyers to participate in the auction by spreading the word through his neighboring buyers. It is assumed that the buyers have zero cost in spreading the information. The mechanism designed should be such that the buyers not only reveal their true value, but also truly spread the information to all their neighbors, and this is where the complexity lies.

The problem as stated above was coined in a recent earlier paper and it was solved for the case of the seller selling a single item. This paper generalizes it to multiple units being sold, but each buyer still interested in a single unit of the item. The paper is technically strong: the generalization to multiple copies without compromising on truthfulness is non-trivial.

One issue I have is that the payment scheme that the authors have could easily motivate the buyers to collude and have just one of the buyers find a new buyer, so that he can receive non-zero payment from the seller (which can be later shared between all the colluding buyers). While VCG itself is very vulnerable to collusion, the setting in this paper seems even more vulnerable. The other drawback is because the analysis is done fully in worst-case, one cannot quantify the extent to which revenue increases etc. But then if the seller doesn't even know the existence of a buyer, a Bayesian model doesn't make such sense either. Finally, given that the model and the initial mechanism for the special case of 1 item were done in an earlier paper, this paper is incremental in some sense.

Overall the problem is crisp, and the solution is not trivial.

* Review *
- Full Paper Recommendation: 8
- Relevance: 8
- Novelty: 7
- Significance: 8
- Readability: 6
-Technical Quality: 8

- Comments to Authors :
Summary of the Paper
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The paper extends an earlier work for cost-free advertising when selling one item in social networks. While selling one item has a very elegant structure to select the winner and decide the payment to achieve truthfulness including the willingness for advertising, the multiple item case really becomes much more involved. The result in the paper could be very influential given the importance of “free-advertising”. On the other hand, due to the complexity of the problem, it would be better if the authors could give more intuitive explanations about those symbols used in the designed mechanism.

Justification for the Scores
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The paper fits the audience of AAMAS well. The technical contributions of the paper are quite good and the extensions from single item to multiple item are highly non-trivial. The paper is overall well written except that more intuitive explanations could be given for the sets defined in the

mechanism.

Constructive Comments to Improve the Paper
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When introducing the mechanism for single item, it will be good to state how tie breaking is dealt with.
Page 2, left, line -21, change “.” To “,”.
Page 3, left, line 22, delete “in”.
Page 4, left, in Definition 4.2, second item, delete “for all i \in N” and please define “efficient allocation” (does it mean the social welfare maximizing allocation?).
Page 4, caption of Figure 3, change “numeber” to “number”.
Page 4-5, in the mechanism, it might be better to use “stack” instead of “queue”; When adding the children into the stack, does the order of insertion matter? In (2), N^{opt} is static but winning set W is dynamic, so this “i.e.” seems not appropriate. In (4), change “gives” to “give”.
Page 6, left, (6), line 3, delete “to”; “Lastly, computes” ->”Lastly, compute”

Questions for Rebuttal
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More intuitive explanations of sets of agents defined in the mechanism.

After rebuttal

Thank you for your careful explanations!

- Metareview:
Summary of reviews
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Please address minor comments prior to final submission.