

Dear Editor,

We would like to submit the manuscript "Improving Comparison Shopping Agents' Competence through Selective Price Disclosure" for consideration for publication in EJOR. This paper studies a new approach, which we term "selective price-disclosure", for affecting a buyer's decision when using a comparison shopping agent (CSA). The blooming of comparison shopping agents (CSAs) in recent years enables buyers in today's markets to query more than a single CSA while shopping, thus substantially expanding the list of sellers whose prices they obtain. From the individual CSA point of view, however, the multi-CSAs querying is definitely non-favorable as most of today's CSAs benefit depends on payments they receive from sellers upon transferring buyers to their websites (who make a purchase). The most straightforward way for the CSA to improve its competence is through spending more resources on acquiring more sellers' prices, potentially resulting in a more attractive "best price". In our paper we suggest a complementary approach that improves the attractiveness of the best price returned to the buyer without causing the CSA to spend any additional resources. This is our selective price-disclosure approach, which relies on removing some of the prices known to the CSA from the list of results returned to the buyer. The advantage of this approach is in the ability to affect the buyer's beliefs regarding the chance of obtaining more attractive prices if querying additional CSAs. The paper presents two methods for choosing the subset of prices to be presented to a fully-rational buyer, attempting to overcome the computational complexity associated with evaluating all possible subsets. The effectiveness and efficiency of the methods are demonstrated using real data, collected from five CSAs for four products. Furthermore, since people are known to be bounded rational, the two methods are also evaluated with human subjects. The results of the latter experiments show that selective price-disclosure can be highly effective also with people, however the subset of prices that needs to be used should be extracted in a different (and more simplistic) manner.

We believe the paper should be of interest to the EJOR audience as it targets a practical decision problem, and touches directly on CSA technology, which have become prominent in recent years. In a more general context, the selective disclosure approach can be of use in various other decision situations, as detailed in the paper (e.g., car dealer attempting to influence a car buyer to avoid checking other dealers' offers, an online dating platform attempting to influence a user to avoid checking profiles in competing platforms and a real-estate broker attempting to influence a house buyer to terminate her search and bid on one of the houses shown to her).

The manuscript substantially extends a conference paper of ours that was presented in the Twenty-Seventh **AAAI** Conference on Artificial Intelligence (AAAI-2013) and will appear in the conference proceedings (downloadable from:

<http://u.cs.biu.ac.il/~hazonn/publications/csa.aaai13.pdf>). A brief summary of the major changes in the submitted manuscript compared to the conference paper follows:

1. Many explanations, motivations and discussions were added throughout the paper, giving more details whenever necessary and improving the general exposition.

2. Several new experiments with people were added for highlighting effects such as the influence of a wide range of prices over the termination probability.
3. The existing experiments were extended to include more participants, strengthening the statistical significance of the results.
4. The conclusions section was extended to discuss the applicability of the new approach to non-CSA domains.
5. New analysis concerning the effect of the different model parameter (e.g., the best known price, number of CSAs queried) over the critical cost was added.
6. New analysis better justifying the case where the CSA is the first to be queried (including numerical analysis) was added.
7. The two price disclosing methods are now described with pseudo-code which makes it easier for the reader to follow.
8. The related work section was substantially extended, and it now includes the review of many tangential areas of research, pointing to the main differences from what we do.
9. New figures added: Figure 1 (describing the interactions and information exchange in our model) Figure 2 (describing the effect of the minimal price on the critical cost), Figure 3 (describing the effect of the number of queried CSAs on the critical cost), Figure 4 (describing the upper bound of improvement based on the number of queried CSAs and the number of CSAs that will be queried later), Figure 5 (describing empirical $N(w)$ for two products), Figure 7 (describing extended results of simulation with fully-rational agents over 100,000 subsets), Figure 11 (describing probability density function of the products we used for our experiments and agents' analysis),
10. New Tables added: Table 1 (giving evidence for the fact that there is no CSA that generally returns more prices than another) and Tables 2, 3 (depicting the statistical significance of the experiments with people).

Thank you for considering this manuscript. We look forward to hearing from you!

Sincerely,

Chen Hajaj, Noam Hazon and David Sarne