

**Subject** Good news: IJCAI 2011 submission number 873  
**Sender** Toby.Walsh@nicta.com.au <Toby.Walsh@nicta.com.au>  
**Recipient** dzhao@scm.uws.edu.au <dzhao@scm.uws.edu.au>  
**Date** 01.04.2011 00:39



---

Dear Dengji Zhao:

I am delighted to inform you that the following submission has been accepted to appear in the IJCAI 2011 proceedings, and to be presented at the conference by means of both a talk and a poster:

Mechanism Design for Double Auctions with Temporal Constraints

The Program Committee did an amazing job reviewing the 1325 papers submitted to the conference. Of these, only 227 papers (17%) were considered to be of sufficient quality and interest to merit both a talk and a poster. Please repay their efforts by taking on board their suggestions when you revise your paper. You have two weeks to prepare your final copy.

The deadline for uploading camera ready copy is 15 April 2011 at <http://www.aaai.org/Publications/Author/registration-letter-ijcai.php> I will send you more detailed instructions shortly (including how you can if you wish purchase two additional pages to the six you already have).

There are several other deadlines in the next few weeks that may be relevant to you.

First, many workshops and related events have their submission deadlines in the next week or two. Please consider participating in these. See <http://ijcai-11.iiia.csic.es/program/workshops>

IJCAI and the AI Journal offer travel grants to attend IJCAI. The deadline for application is April 7th: [http://ijcai-11.iiia.csic.es/travel\\_grants](http://ijcai-11.iiia.csic.es/travel_grants)

There is also a volunteer program (deadline April 15th) which provides complementary registrations: [http://ijcai-11.iiia.csic.es/students/volunteers\\_program](http://ijcai-11.iiia.csic.es/students/volunteers_program)

Registration for IJCAI 2011 will go live in the next week. Early registration is by May 15th.

Finally, let me congratulate you on your fine work. If you have any additional questions, please feel free to get in touch.

Best Regards,

Toby Walsh  
IJCAI 2011

---

---

IJCAI 2011 Reviews for Submission #873

---

---

Title: Mechanism Design for Double Auctions with Temporal Constraints

Authors: Dengji Zhao, Dongmo Zhang and Laurent Perrussel

---

---

REVIEWER #1

---

---

-----  
Reviewer's Scores  
-----

Relevance: 8  
Significance: 7  
Soundness: 6  
Originality: 6  
Evaluation and comparison: 3  
Clarity: 4  
OVERALL SCORE: 6

-----  
Comments  
-----

The authors present a mechanism design for double auction with temporal constraints. They provide allocation and payment schemes that rely on the graphical structure of the matching problem between buyers and sellers, and prove that it is truthful.

The authors present this work initially as a problem in dynamic / online setting, where the bids are available in specific time intervals. Then they modify the problem into a static one by assuming all the bids are available in advance, but they carry a time interval as constraint. Of course, this cannot be considered an online setting and the introduction is misleading in that sense. The main difficulty in online setting is that you \*do not know\* the set of bids in advance.

This is a static setting in which the bids carry an additional dimension which is the time constraint. In fact, this is a special case of (static!) multi-attribute double auction, in which the time constraint is the only non-price attribute. In that case, the only efficient truthful mechanism is VCG. Is the MM payment a type of VCG payment? otherwise, I did not manage to understand why this is not a setting in which the only mechanism is VCG, and if it is, what is the contribution of the mechanism? is it a way to compute a convenient type of VCG payment? VCG allocation is done by finding an optimal matching, and computing VCG payments, as the authors mention at the end. Is the result of the paper is a way to compute VCG payment in  $O(n^3)$  instead of

$O(n^5)$ ? if this is the case then it has to be stated explicitly as the contribution, and the connection to the general VCG form has to be made.

Also, the fact that the clearing problem of these markets can be modeled as a bi-partite matching problem have been noted and studied before in the context of multi-attribute auctions by Michael Wellman's group (e.g., Engel, Wellman, and Lochner 2006: "bid expressiveness and clearing algorithms in multi-attribute double auctions"). However, I am not aware of works that considered mechanism design for multi-attribute double auctions. Also, the use of the graphical structure over the constraints to search for the monotonic allocation and truthful payment policy is nice - if there is value to it, and this is what I am not sure about.

---

---

REVIEWER #2

---

---

-----  
Reviewer's Scores  
-----

Relevance: 9  
Significance: 8  
Soundness: 8  
Originality: 8  
Evaluation and comparison: 7  
Clarity: 8  
OVERALL SCORE: 8

-----  
Comments  
-----

The paper introduces algorithms for finding efficient and truthful allocation and payment policies describing a mechanism for implementing a static double auction market with temporal constraints. The authors provide a careful framework for casting the problem of computing optimal policies as a (weighted) bi-partite graph matching problem, to which established methods can be applied. The work is well motivated, and includes several key Theorems which justify the algorithms. One such Theorem shows that the algorithms proposed enjoy favorable computational complexity.

The paper is generally quite clear, and carefully written. There are many small but important details, and it is evident that the authors have made every effort to provide a mostly complete, self-contained exposition. The subject of the paper is somewhat outside of the particular domain of expertise of this reviewer, but to the best of my knowledge the work reflects a good degree of novelty and creativity.

One (possibly significant) drawback however, is the fact that this work does not directly address realistic, \*dynamic\* double auction markets. The authors argue that the present contributions could serve as a baseline and could aid future work analyzing dynamic markets, however this argument is largely limited

to a few introductory and concluding sentences. The impact of the paper could perhaps be enhanced by further explaining exactly how this work might be extended or relaxed to handle the dynamic case, if at all, what hope there is for achieving algorithms with comparable guarantees and complexities, or how the work could be used to help evaluate other, distinct attempts at mechanisms describing dynamic double auctions.

Finally, there are no experiments or fully worked examples demonstrating the algorithms. It appears this could be due to space constraints, but the paper stands to benefit from additional illustrative examples and/or some simulations (even brief). The proofs could perhaps be moved to a supplemental section entirely in order to create space for experiments and further discussion.

---

---

REVIEWER #3

---

---

-----  
Reviewer's Scores  
-----

Relevance: 7  
Significance: 5  
Soundness: 7  
Originality: 7  
Evaluation and comparison: 6  
Clarity: 7  
OVERALL SCORE: 7

-----  
Comments  
-----

The authors describe a truthful and efficient mechanism for one-shot double-auctions in which bidders report values as well as temporal constraints (as time intervals). Under the restriction that reported intervals are a subset of true interval constraints, the authors offer an efficient (in allocative and computational sense) and incentive compatible mechanism for this double-auction using a truthfulness characterization and mapping the problem to bipartite graph matching.

I think this is a nice paper in many respects. It is clearly and crisply written, with a sound contribution. I think that the impact is of more interest to double-auctions that are run more like call markets rather than continuous double-auctions.

In any case, I have a few minor comments.

1. "reporting his true type is his dominant strategy, \*regardless o the reports from other traders\*." the last part is redundant. Just put a period after "his dominant strategy".

2. The most disappointing thing about this paper is the lack of any simulations with the algorithm.  $O(n^4)$  or  $O(n^3)$  computational complexity is practically nearly useless when  $n$  is large. As given, this work is thus potentially entirely impractical. My strong suspicion is that in practice (perhaps via the use of clever heuristics) you can get it down to something much more reasonable. At the minimum, the offered construction would serve as valuable guidance to developing practical algorithms in this setting. In any case, it would be useful to see how fast it runs and how well the algorithm scales.

3. Another useful simulation study would be to check the amount of deficit this mechanism generates (per Myerson/Satterswaite result, mentioned in the conclusion). If it is large, yet again this becomes impractical, but there is a good chance that this can be somewhat controlled. Perhaps you can also minimize deficit subject to efficiency/truthfulness constraint (maybe using automated mechanism design, a la Conitzer/Sandholm and Conitzer/Guo).

---

---

REVIEWER #4

---

---

-----  
Reviewer's Scores  
-----

Relevance: 8  
Significance: 7  
Soundness: 7  
Originality: 7  
Evaluation and comparison: 6  
Clarity: 6  
OVERALL SCORE: 7

-----  
Comments  
-----

Meta-review:  
-----

During reviewer discussions, one thing that emerged clearly was that all the reviewers thought the contribution itself was valuable, but that it could have been framed better. We encourage the authors, in the final version, to especially consider these points, in addition to all the other reviewer comments:

1. The relation of the mechanism to VCG should be presented more clearly, as also should the fact that the contribution is to present a faster way to compute VCG payments for this special case.

2. It should be made clear in the Introduction that the results are not primarily motivated by application to online/dynamic environments.

--

This message has been scanned for viruses and dangerous content by MailScanner, and is believed to be clean.