# Review of: "Solving Pallet loading Problem with Real-World Constraints"

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Potential competing interests: No potential competing interests to declare.

**Title: Solving Pallet Loading Problem with Real-World Constraints**

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The authors have undertaken an interesting problem of loading the transport units on pallets. The variety of transport units with respect to their dimensions needs to loaded in such a way so as to utilize the available space in the best possible way while ensuring the safety of the goods being transported in the units. The authors have proposed a branch and bound technique to solve the problem.

There are a few concerns that need to be addressed:

1. Section titled "Method for solving pallet loading problem" (Page 3). The upper bound is not properly defined. The expression mentioned $K$ and $k$ while the definition below this expression defines only $K$.

2. Also, in the same expression, $u_{ij}$ is supposed to be a binary variable. Please use the appropriate parenthesis for representing the discrete set in the expression.

3. The authors are advised to geometrically explain the definition of set $S_{j,k}$ (Page 4).

4. The authors have identified the set of extreme points through six different sets, $x\_y, x\_z, y\_x, y\_z, z\_x, z\_y$. It would be better if the authors can provide an example or the geometrical intepretation of these sets.

5. There are two statements in the article on Page 4. "Potential positions of transport units on the pallet are defined as so-called extreme points." and "Not all possible potential positions of transport units are covered by extreme points, but in this way we prevent the search tree from becoming too large and reduce the search time, while the generated potential positions are favourable." The authors are requested to clarify the two statements.

6. In the practical constraints (Page 4), the authors have defined the vertical support as the percentage of the bottom surface of the transport unit that is supported by other transport units or the pallet. What is the minimum percentage required in this case? Also provide the permissible distance between the supporting and supported surfaces alongwith the minimum horizontal support.

7. Is there a specific procedure to define the above mentioned permissible distance?

8. The authors are advised to present the sets $S_{z,i}, S_{x,i}, S_{y,i}$ geometrically.

9. How is the "picking order" defined?

10. The algorithm works on the pre-fixed maximum number of branches. The authors should explain the impact of the different number of branches on the result or the search procedure.

11. The authors have performed some experiment and implemented the proposed algorithm in MATLAB. However, the authors have not provided the design of experiment. In case of random data, the authors are advised to share the ranges for all type of data considered therein, i.e. the dimensions of transport units, dimensions of pallet, priority order, etc. There is no information regarding the deformities of the units or those caused while placing them on the upper layers. There is no information regarding the stability of the pallet configurations. The authors are advised to share the details of all the parameters that have been defined and considered while implementing the algorithm.

12. The figure on Page 7 does not share the details of how the pallet configuration has been obtained. Provide the complete information of these arrangements.

13. The authors are advised to provide the details of the computation time to determine the solution(s) generated by the algorithm. And how the algorithm fairs in comparison to the other algorithms that have motivated the authors to take up the problem.

14. The authors are advised to present the findings and conclude the article with the advantages of the proposed branch and bound technique and also the limitations, if any.

15. The most recent article cited in the article dates to 2016. The authors are advised to go through the recent articles that may provide some new inputs to be considered while solving the algorithm.

16. The authors are advised to check the article for spelling and grammatical errors and remove the same.