Referee Report for

A new non-monotonic infeasible simplex-type algorithm for Linear Programming (#43768)
By
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This paper introduces a new simplex-type algorithm for Linear Programming with the following two main characteristics: i) the algorithm computes basic solutions which are neither primal or dual feasible, nor monotonically improving and ii) the sequence of these basic solutions is connected with a sequence of monotonically improving interior points to construct a feasible direction at each iteration. The authors compare their proposed algorithm with the state-of-the-art commercial CPLEX and Gurobi Primal-Simplex optimizers on a collection of 93 well known benchmarks. The results are promising, showing that the new algorithm competes versus the state-of-the-art solvers in the total number of iterations required to converge.

There are some shortcomings that do not prevent the research from being published. These faults are summarized as follows:

Authors should choose the data set that has the following properties:
1- The benchmark problems must be varied according to size
2- The benchmark problems must be varied according to the sparsity because most of the used problems are dense problems.
3- The data set of the benchmark problems must has a large number of problems.
On the other hand, the CPU time of the proposed algorithm must be manipulates.

This paper is suitable for publication in the PeerJ Computer Science.