Associate Editor's Report

"A penalty-evaporation heuristic in a decomposition method on the maximum clique problem"

October 2003

Two of the three reviewers recommend that additional work is needed and that the paper should be re-reviewed again after that. In particular, the decomposition method needs more exposition and computational comparisons. Without both of these adequately addressed in the next version, the paper will need to be declined.

2nd review on "a penalty-evaporation heuristic in a decomposition method for the mcp"

i still recommend publication after changes. in my opinion the decomposition part is weak compared with other methods. and a computational comparison or computational
experiments with algo. of babel should be considered. main focus should be on p-e heuristic.

find at the end of the email short remarks for the authors.

best regards,
volker

on p.6, step 4:
setminus sign should be \ instead of /

on p-6, proof:
it should be explained, why there must be an iteration,
where the intersection between c^k and c^* is not empty.

i still believe it would be better to start with the P-E algorithm,
since here the research focus can be found. the decomposition method appears to me too easy, compared to e.g. babel's approach, because it is a 1-level reduction only, and has little impact on the problem dimension. if the focus maintains on the decomposition, a recursive exact approach should be considered.

i do think that the computational comparison with babel is in the scope of the article, because 1) the decomposition is very similar to babel's (except that babel uses recursion as well) and 2) babel is an indeed well working clique finding (and proving!) algorithm.

1.

Second report on the paper:

A penalty-evaporation heuristic in a decomposition method for the maximum clique problem

Even if the authors have taken into account most of my recommendation still the current version is not fully satisfactory. In fact, in my former report I had asked the authors to clarify the role played by cliques in the decomposition algorithm. In fact, both in the decomposition algorithm as well as in the proof, one can substitute the (arbitrary) clique with any arbitrary set of vertices. This derives from the simple observation that, given a vertex i 2 V, if no improving clique is found in the graph G(i) (i.e. the graph induced by fig [N(i)), then vertex i can be discarded. Actually, this observation is the basis of a standard branching. The authors seem to be partially aware of this relation in the (quite involved) comment added at the end of section 3. Also, the authors added a table of results at the end of Section 5 in order to show the e®ectiveness of their decomposition methodology, but no e®ort is made to justify such results. So, I invite the authors to revise again their paper in order to better clarify the role of the cliques in the decomposition method.