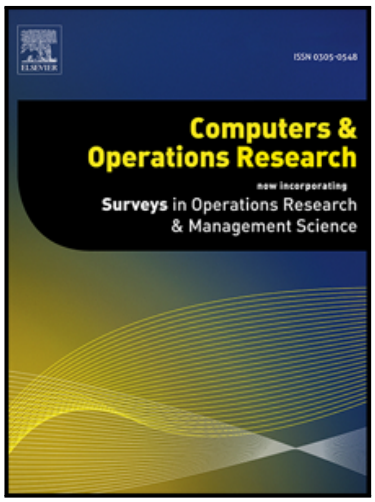

Exact algorithms for bi-objective ring tree problems with reliability measures

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Highlights

- Four novel reliability measures for ring tree network design are proposed as an alternative for cost minimization
- We develop a generic ϵ-constraint method to solve the four bi-objective problems which is enhanced by objective space heuristics
- The single-objective subproblems are solved to optimality with a branch and cut method based on multi-commodity flow formulations
- We provide a comprehensive computational study of our algorithm and illustrate Pareto front solutions