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Tabu Search to Draw Evacuation Plans in Emergency Situations

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Abstract : Disasters are quite experienced in our days. They are caused by floods, landslides, and building fires that is the main objective of this study. To cope with these unexpected events, precautions must be taken to protect human lives. The emphasis on disposal work focuses on the resolution of the evacuation problem in case of no-notice disaster. The problem of evacuation is listed as a dynamic network flow problem. Particularly, we model the evacuation problem as an earliest arrival flow problem with load dependent transit time. This problem is classified as NP-Hard. Our challenge here is to propose a metaheuristic solution for solving the evacuation problem. We define our objective as the maximization of evacuees during earliest periods of a time horizon T. The objective provides the evacuation of persons as soon as possible. We performed an experimental study on emergency evacuation from the tunisian children's hospital. This work prompts us to look for evacuation plans corresponding to several situations where the network dynamically changes.

Keywords : dynamic network flow, load dependent transit time, evacuation strategy, earliest arrival flow problem, tabu search metaheuristic
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