

# A greedy evolutionary hybridization algorithm for the Optimal Network and Quadratic Assignment Problem

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**Abstract:** This study investigates a combinatorial optimization problem called the Optimal Network and Quadratic Assignment Problem. It has been introduced by Marc Los in 1978 as a model of a urban planning problem that consists of optimizing simultaneously the best location of the activities of an urban area (land-use), as well as the road network design (transportation network) in such a way to minimize as much as possible the routing and network costs. We propose a mixed integer programming formulation of the problem, and a hybridization of a greedy method with an evolutionary heuristic method for the resolution. Some numerical experiments on randomly generated instances based on quadratic assignment problem library QAPLIB, and on real-life data of Dakar city, show the efficiency of the method.

**Keyword:** transportation network, land-use plan, quadratic assignment problem, heuristic.