Dynamic Suspect Containment Model on Equal-Length Networks

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Abstract

This study investigates the dynamic suspect containment problem, assuming equal network edge lengths and equal speeds for traffic police and the suspect. A 0-1 linear integer programming model is developed for the traffic police dispatching problem under updated suspect movement information. The model utilizes vertex cut conditions to enable the dispatched police forces to form a containment ring, while also modeling the suspect' s escape behavior, thereby obtaining a dynamic simulation model for the dynamic suspect containment problem. The numerical example considers splitting edges in networks with non-equal lengths, and subsequently treats the divided network as an equal-edge-length network.

Full Text

Dynamic Suspect Encirclement Model over Network with Equal Length Edges

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Abstract

This paper studies traffic and patrol police's suspect dynamic encirclement problem. We assume that the network edges have equal length and the police and suspect have equal speed. First, we develop a 0-1 linear integer programming

model for the police assignment problem with suspect movement information update, which uses the vertex cut conditions to let the police form an encirclement. Then, we model the rule of the suspect' s escaping behavior. Finally, we obtain a simulation model for the dynamic encirclement problem. We cut the edges into small parts, and then regard the new network as with equal length edges in a numerical example.

Keywords network optimization, dynamic encirclement model, patrol service platform, 0-1 integer program-

Note: Figure translations are in progress. See original paper for figures.