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Finding an anti-risk path between two nodes in undirected graphs. (English) Zbl 1180.90352

Summary: Given a weighted graph $G = (V, E)$ with a source $s$ and a destination $t$, a traveler has to go from $s$ to $t$. However, some of the edges may be blocked at certain times, and the traveler only observes that upon reaching an adjacent site of the blocked edge. Let $\mathcal{P} = \{P_G(s, t)\}$ be the set of all paths from $s$ to $t$. The risk of a path is defined as the longest travel under the assumption that any edge of the path may be blocked. The paper will propose the Anti-risk Path Problem of finding a path $P_G(s, t)$ in $\mathcal{P}$ such that it has minimum risk. We will show that this problem can be solved in $O(mn + n^2 \log n)$ time suppose that at most one edge may be blocked, where $n$ and $m$ denote the number of vertices and edges in $G$, respectively.

MSC: 90C35 Programming involving graphs or networks

Keywords: shortest path; shortest path tree; most vital real time edge; anti-risk path

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References:

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