A Graph Patrol Problem with Locally-Observable Random Attackers

Thomas Lowbridge and David Hodge

University Of Nottingham,UK

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Outline

- Literature review
  - Introduction to Game
    - Pure game
    - Mixed game
  - Solved Graphs
    - Hamiltonian graphs
    - Line graph
- Problem with line graph strategy
- Correction of line graph strategy
- Extension of correction strategy
- Future work

Game with non-observed

A Patrolling game with random attackers, $G = G(Q, \boldsymbol{X}, \boldsymbol{\lambda}, \boldsymbol{c})$ is made of 4 major components

- A Graph, $Q = (N, E)$, made of nodes, N ($|N| = n$), and a set of edges, E.
- A vector of attack times, $\boldsymbol{X} = (X_1, ..., X_n)$.
- A vector of arrival rates, $\boldsymbol{\lambda} = (\lambda_1, ..., \lambda_n)$.
- A vector of costs, $\boldsymbol{c} = (c_1, ..., c_n)$

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The game is played over an infinite time horizon, $\mathcal{T} = 0, 1, ...$
A patroller's policy in the game is a walk (with waiting) on the graph,

$$W : \mathcal{T} \to N$$

A deterministic, stationary policy, π is a subset of all the possible walks, we will focus on these types of policies [DO I NEED A REASON ???]