國立交通大學應用數學系
離散數學專題(一)演講通告
Combinatorics Seminar

主講人： 楊皓琮 先生 (交大應數系 98 級，現為 Ph.D. student of

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講　題： Safety Patrol Scheduling Using Randomized Traveling

Salesman Tour

時　間：106 年 9 月 11 日(星期一) 下午 1:40 –2:40

地　點：(光復校區) 科學一館 213 室

Abstract

In this talk, we consider the problem of designing schedules for a patroller to guard a given set of n sites in a strategic setting modeled as the attacker-defender game. It belongs to the general framework of security games and the main challenge here is to explicitly model the time spent moving between the sites and the scalability issue, as the strategy space contains exponentially many schedules even with a finite time horizon. The traveling salesman tour visits all sites with the highest frequency but is deterministic and could be exploited by the attacker. Random tours are most unpredictable but could be substantially inefficient in visiting the sites. Instead, we formulate the randomized TSP problem and provide solutions that achieve a nice tradeoff between frequency in visiting the sites and unpredictability for the strategic setting. We provide a rigorous analysis of the randomized TSP and show how to solve for the best defender strategies under this family of tours. Evaluations demonstrate the effectiveness of our solutions compared to other alternatives using both artificial data and a real world crime data set.

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