

# Better Patrolling strategies to detect fare invasion

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No of Students 1.

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## 1. Project Description

Fare invasion while commuting in public transport is a big problem and public transport authorities lose lot of revenue due to fare invasion. To deter fare invasion, typically patrolling is done. If patrolling is executed inefficiently or in a fairly predictable manner, the passengers can easily avoid fares. [1] is one such instance.

The exponential growth in number of patrolling strategies makes the problem of determining optimal patrolling strategy very hard. TRUSTS [2] is developed to find out better patrolling strategies for LA metro lines. However, it assumes only single line and does not consider the changeovers or multiple lines at the same station and the passengers can have multiple paths to reach same destination.

In this project you are expected to analyze more topologies than just single line, form it as a game between patrol unit and passengers and find out what are better patrolling strategies.

## 2. Goals/Tasks

- i. Understand TRUSTS
- ii. Develop a game between passengers and patrolling unit for various topologies
- iii. Develop a software which can be used by the patrol units with neat and easy to use GUI to enter information about topology, passenger statistics so as to determine patrolling strategies.

## 3. Required Skill set

- a. Good Programming knowledge
- b. Knowledge of Game Theory
- c. Knowledge of linear programming in optimization

#### 4. References

- i. <http://www.thehindu.com/news/national/travel-ticketless-in-trains-if-caught-touts-pay-for-you/article5252855.ece>
- ii. Yin, Zhengyu, et al. "TRUSTS: Scheduling randomized patrols for fare inspection in transit systems using game theory." *AI Magazine* 33.4 (2012): 59.