

## **Abstract**

Many models have been developed to study homeland security games between governments (defender) and terrorists (attacker, adversary, enemy), with the limiting assumption of the terrorists being rational or strategic. In this paper, we develop a novel hybrid model in which a centralized government allocates defensive resources among multiple potential targets to minimize total expected loss, in the face of a terrorist being either strategic or non-strategic. The attack probabilities of a strategic terrorist are endogenously determined in the model, while the attack probabilities of a non-strategic terrorist are exogenously provided. We study the robustness of defensive resource allocations by comparing the government's total expected losses when: (a) the government knows the probability that the terrorist is strategic; (b) the government falsely believes that the terrorist is fully strategic, when the terrorist could be non-strategic; and (c) the government falsely believes that the terrorist is fully non-strategic, when the terrorist could be strategic. Besides providing six theorems to highlight the general results, we find that game models are generally preferred to non-game model even when the probability of a non-strategic terrorist is significantly greater than 50%. We conclude that defensive resource allocations based on game-theoretic models would not incur too much additional expected loss and thus more preferred, as compared to non-game-theoretic models.

## **Citation**

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