

## A Survey on Weapon Target Allocation Models [Ghanbari et al., 2021]

- Two key components of command and control are: weapon target allocation (WTA) and threat evaluation.
- Resource allocation is stochastic/uncertain with regard to the WTA problem.
- The WTA component of the WTA problem can be considered in 3 parts: response planning, response execution, outcome assessment.
- There exists three basic models:

Basic Model 1 For maximizing damage to enemy (minimize expected target values  $F$ ), we have

$$\min( F ) = \sum_{i=1}^{|T|} V_i \prod_{k=1}^{|W|} (1 - P_{ik})^{x_{ik}}$$

This is the general WTA formula.

Basic Model 2 For allocation of available units to maximize expected total protection value  $J$ , we have

$$\max( J ) = \sum_{j=1}^{|A|} \omega_j \prod_{i \in G_j} (1 - \pi_{ij} \prod_{k=1}^{|W|} (1 - P_{ik})^{x_{ik}})$$

Basic Model 3

## Optimization of decision support system based on three-stage threat evaluation and resource management [Naseem et al., 2017]

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## An approximate dynamic programming approach for comparing firing policies in a networked air defense en- vironment [Summers et al., 2020]

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## **Threat Evaluation In Air Defense Systems Using Analytic Network Process [Unver and Gürbüz, 2019]**

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## **The SSA-BP-based potential threat prediction for aerial target considering commander emotion [Wang et al., 2022]**

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## References

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