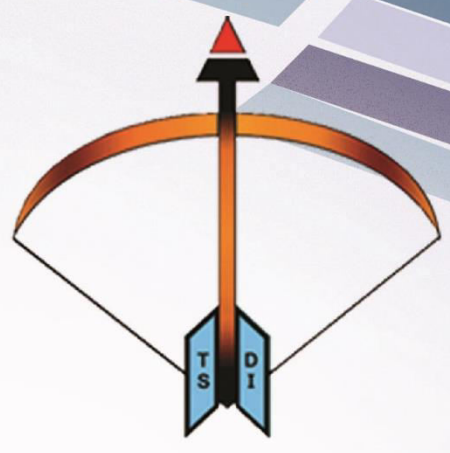




Temasek Defence Systems Institute

AIRCRAFT EVALUATION USING STOCHASTIC DUELS

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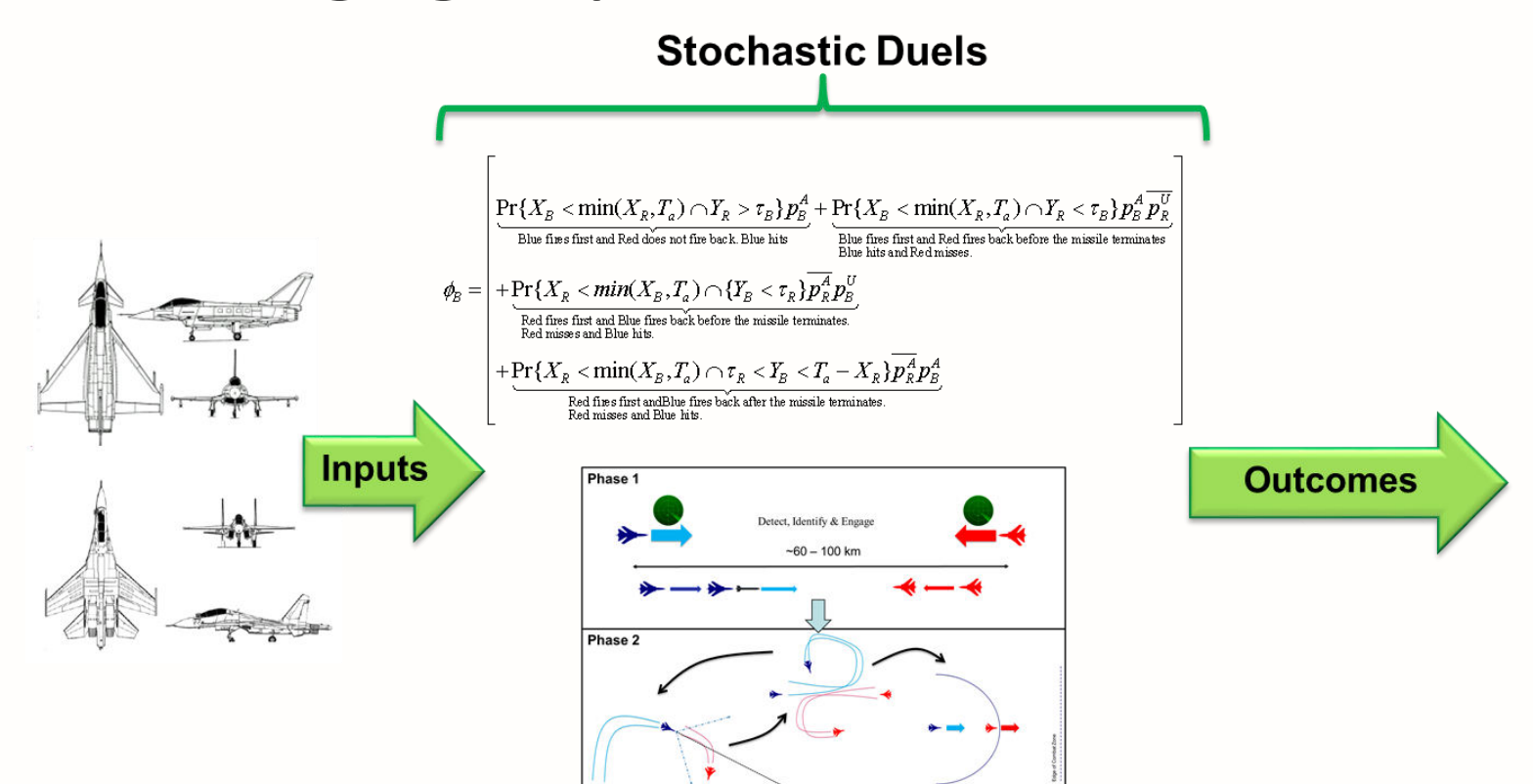
Objective: To develop a modeling paradigm that uses stochastic duels to evaluate the performance of fighter aircraft in one-on-one air combats.

Research Result:

- An analytical model using stochastic duels that can be solved without extensive computational effort.
- Phase 1 is solved using a probability model.
- Phase 2 is solved using a discrete-time Markov chain.

Research Idea:

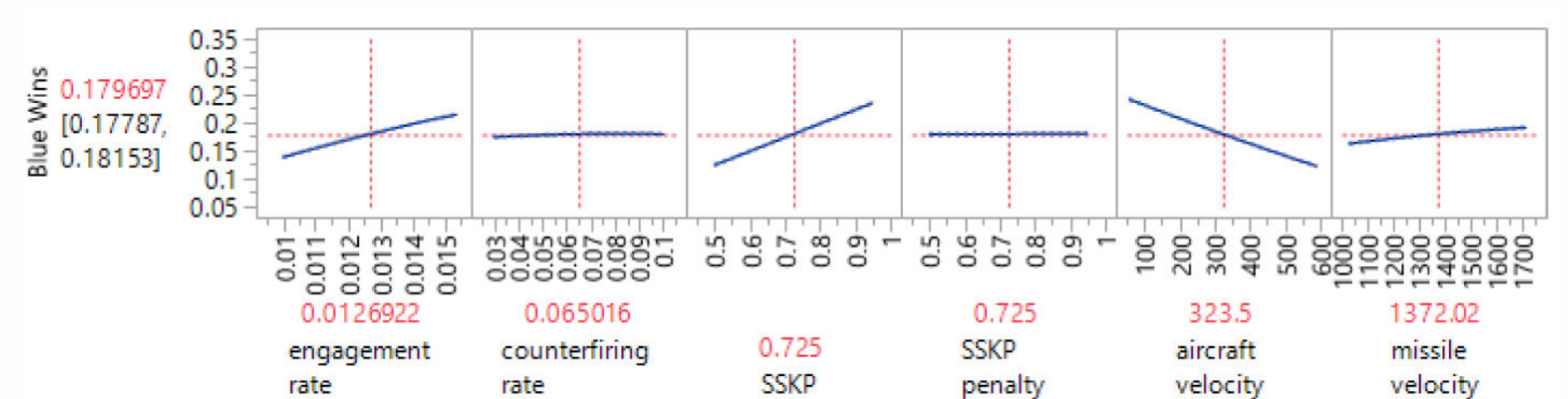
- An interconnected two-phase air duel. Phase 1 is the Approach phase; phase 2 is the Dogfight phase.



- Incorporate Kinematics and Basic Flight Theory to enhance the fidelity of the analytical model.

Potential Applications:

- First-order approximations prior to running large-scale simulations; savings in terms of both time and money in simulation-oriented evaluations.
- Meta-modelling technique used to construct a response surface of an air duel with two opposing aircraft to produce greater insights



Follow-up Researches:

- Many-on-many air combat evaluation using stochastic duels.
- Air-to-ground mission evaluation using stochastic duels.

