

Optimization of Aimpoints for Coordinate-Seeking Weapons

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OBJECTIVE:

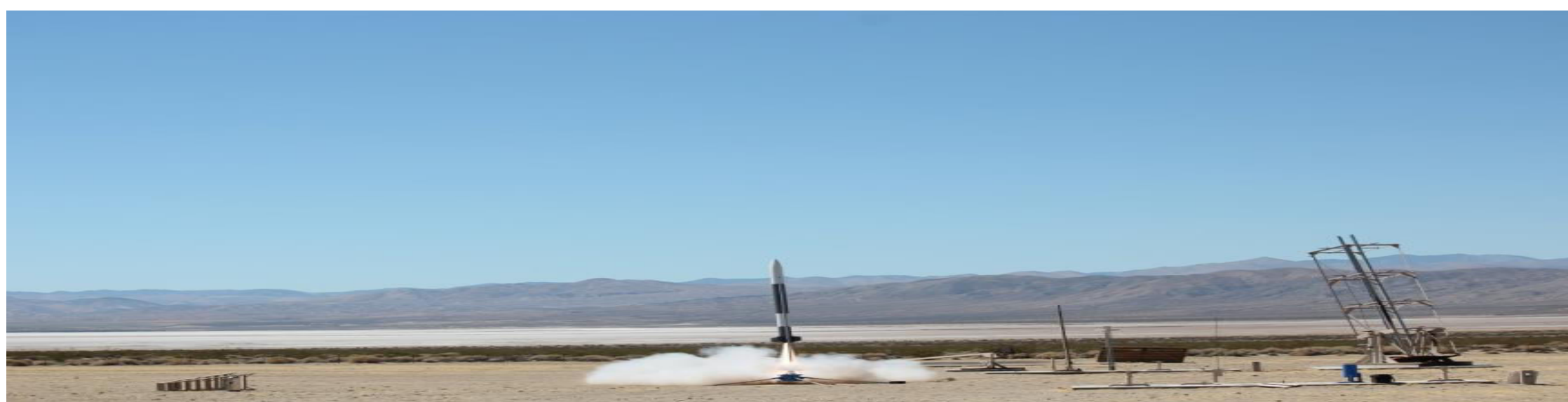
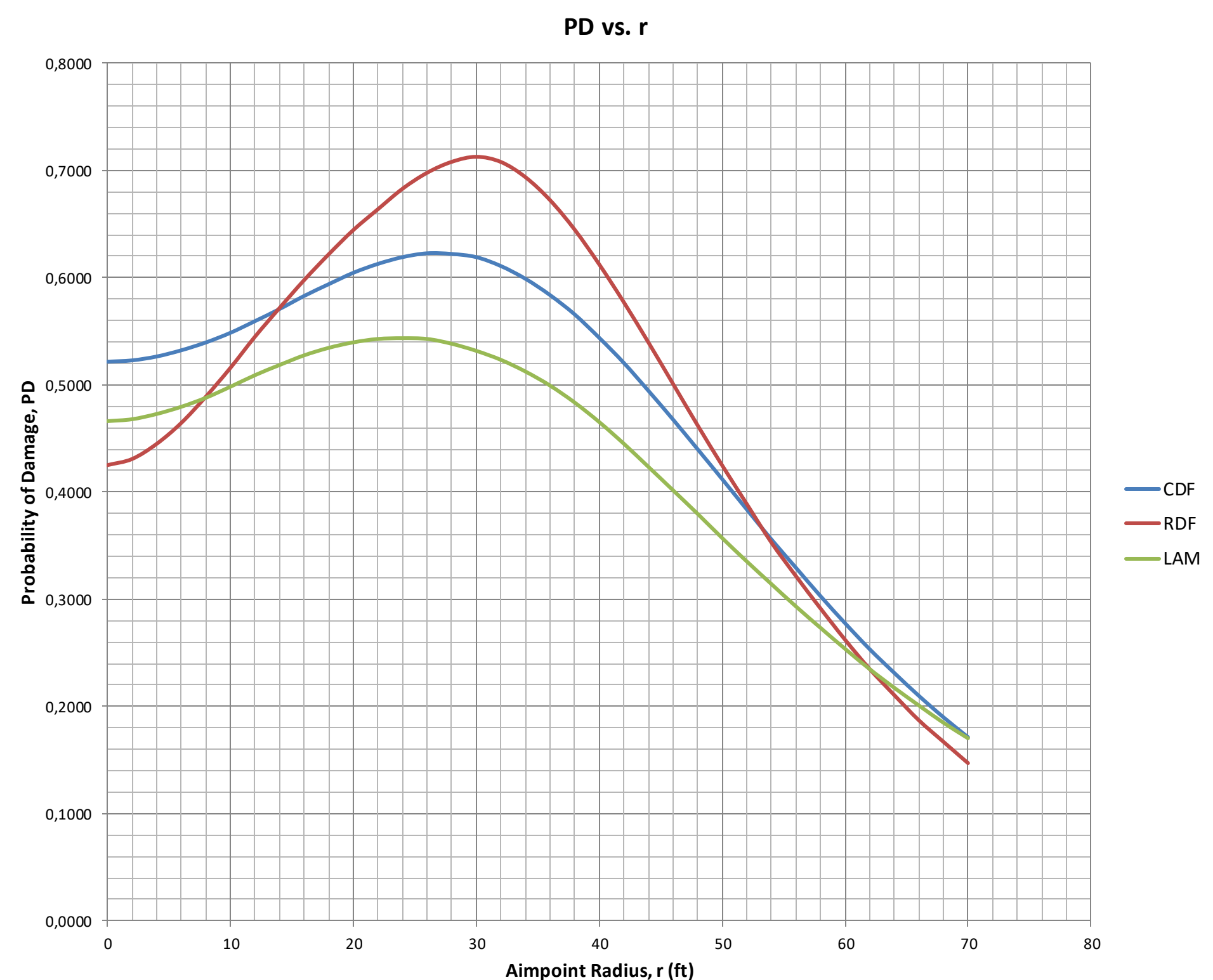
Develop a tool for optimizing the aimpoint placements (spread) around a unitary target for multiple coordinate-seeking weapons (bombs) for the highest probability of damage.

MAIN RESEARCH IDEA:

Using 3 most commonly-used damage functions (LAM, CDF, RDF) and taking into account the weapon characteristics & accuracies (dependent & independent errors), the Probability of Damage (PD) is generated for various aimpoint radii (r) on the unitary target by randomizing the 'actual' weapon impact points using the Monte-Carlo mathematical approach.

RESEARCH RESULTS:

- 1) A maximum PD can be identified from the optimization program at a corresponding aimpoint radius r .
- 2) The PD obtained at this aimpoint radius r is higher than when we aim all the weapons at the 'target'.
- 3) But there is no advantage in spreading out the weapons in cases of small dependent error.
- 4) Time taken to obtain the optimal weapon aimpoint radius is longer for a higher fidelity damage function, i.e. LAM > CDF > RDF.



BENEFITS OF RESEARCH:

Assists the Weapons System Officer (WSO) onboard a strike aircraft or Targeting Officer (Artillery) in designating the weapon-salvo aimpoints to inflict the greatest damage on the unitary target.

FOLLOW-UP RESEARCH ACTIVITIES:

- 1) Generate PD values against range of aimpoint radii r for areas containing multiple, identical, unitary targets for the calculation of maximum Fractional Damage (FD) values.
- 2) Investigate results of varying input values during weapon effectiveness simulations for multiple weapons across all three damage functions, e.g. variations in impact angle and mean area of effectiveness (fragmentation) for different target types.