Experiment 1 Proposal

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I. Randomly generate 100 unique scenarios of true trajectories
   A. Various scenario sizes
      i. Number targets: [4, 6, 8, 10]
      ii. Number of time steps: [4, 6, 8, 10]
   B. Capture true position data

II. Randomly generate 30 unique perturbations for each scenario
   A. Perturbations distributed Normal(0,1)
   B. Capture perturbation data

III. For each simulation* generate data for all values of σ
   A. Raw data formed by adding perturbation*σ to the true position
   B. Sigma in range of [0.1, 2.0] with step size 0.1
   C. Shuffle raw data to get input data

IV. Run heuristic and MIO on each unique simulation/σ pairing
   A. Heuristic - For each pairing, run heuristic with a range of starting points (N)
      i. N = [100 1,000 10,000]
   B. Warm start MIO with each heuristic solution
      i. Exit optimization after minimin{Run time, Number of IP solutions}
         a. Proposed run time: 2 minutes
         b. Capture solution at 30 sec breakpoints
         c. Proposed number of IP solutions: 5 for P = [4 6], 10 for P = [8 10]
   C. Capture all data and metrics
      i. Heuristic, MIO, and total run times
      ii. Heuristic and MIO objective scores (both absolute value and RSS)

iii. Heuristic and MIO assignments (x_{it} assigned to j)

V. After completion of all simulation runs, analyze performance

A. Scalability

i. Objective score (either abs value or RSS) vs time

ii. Choice to add bound vs time

iii. Summary of run times with comparison by # heuristic starting points (N)

iv. Show in panels of PxT for comparison

B. Quality of Solution

i. Performance measures

a. RSS

b. Developed performance metric (δ)

c. % correct assignments

ii. Compare Random, Heuristic, MIO, and Ideal

iii. Plot vs σ in panels of PxT for comparison