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*Optimal Bayesian Search for Moving Targets.*

Bayesian search theory is used by the US Coast guard to find people and boats lost at sea. In Bayesian search theory, one starts with a prior distribution on the location of the target, a constrained amount of search effort, and a detection function that relates effort as a function of location to the probability of detecting the target given it is in that location . The basic search problem is to find an allocation of effort over locations that maximizes the probability of detecting the target within the effort constraint. For stationary targets, this problem has been solved in great generality over a range of location spaces (discrete and continuous) and detection functions. In the case where the target is moving, the prior distribution becomes a stochastic process giving a probabilistic description of the target's location as function of time. The optimal search for a moving target problem is to find an allocation of effort as a function of time that maximizes the probability of detecting the target by time  $T$  while satisfying an effort constraint at each time in  $[0, T]$ . We show that a certain class of moving target problems can be solved by solving a sequence of stationary target problems and how this result leads to an efficient algorithm for find optimal plans. (Received September 04, 2020)