1125-VM-1548 **Kasie G Farlow***, kasie.farlow@dc.edu, and **Desmond Cummins**, **Joseph Pedersen** and **Brian M Sadler**. *n-Section Querying Methods for Target Estimation on an Interval.* Preliminary report.

We consider a point estimation problem to approximate the location of a unique scalar value target in a known partitioned interval using a twenty questions like game. At each step in the game a noisy oracle is queried as to which set the target resides in. We estimate the target by modeling it as a scalar valued random variable with a prior distribution. We follow a Bayesian type approach in that after each iteration or query we find a posterior distribution of the random variable. We develop new querying techniques by extending the probabilistic bisection method from Jedynak, et, al., and Waeber, et al., to a method which partitions the unit interval into n regions of equal probability with $n \geq 2$. Several different models are considered for the oracle's noisy response using an n-ary channel, including modifications to roughly model human query response error. We analyze this method in terms of entropy, variance and mean square error and find optimal querying policies to maximize the expected entropy reduction per query. Our Simulations show that the variance and mean square error of the posterior probability distribution associated with the estimated target's location converges to 0. (Received September 17, 2016)