ASYMPTOTIC VALIDITY OF THE BAYES-INSPIRED INDIFFERENCE ZONE PROCEDURE: THE NON-NORMAL KNOWN VARIANCE CASE

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1 Summary of Paper

The authors consider a class of problems in ranking and selection in which the objective lies in selecting an alternative of highest mean with a guaranteed probability that the difference between this alternative and the second largest exceeds a certain threshold. Referred to as the indifference-zone formulation, this approach often leads to a large number of samples. Prior work by the second author has constructed a Bayesian-indifference zone that has led to less conservative procedures but requires more stringent assumptions. This paper seeks to weaken these assumptions to allow for known and finite variances and samples being iid but not necessarily normal.

As a reader that is less knowledgeable about R&S problems, I found this paper to be both well written and relatively accessible. Some comments and suggestions follow:

1. It seems that the choice of n_0 is relatively arbitrary. In practice, can problem properties be used to obtain some understanding of how large/small n_0 should be?

2. It does seem to me that we choose a far too stringent threshold, the resulting problem may be rendered infeasible since $\mu_{[k}$ are exogenously specified and presumably unavailable a prior and δ is a user-specified parameter. In re-reading the paper, it seems that the alternatives may have nearly the same means, in which case, the likelihood of infeasibility may be modest.

3. While the BIZ procedure is asymptotically valid, naturally in practice, the schemes have to be terminated after a finite number of samples. Are there error bounds available, even in a restricted regime, that can govern the choice of when the procedure may be terminated.

4. In the numerical experiments, the choice of μ's and δ ensures feasibility. Suppose μ_{100} is set to $\delta + 1$, then unless I have misunderstood how the scheme works, the threshold constraint would render the problem infeasible. In this case, how would the scheme respond?

5. It might be useful to see how the BIZ procedure is indeed less conservative in practice compared to its counterparts in the R&S literature. The authors claim that the proposed procedure requires less samples – presumably this is only an empirical observation. If so, please emphasize that this is the case; else it might be worth pointing to the formal statement that guarantees this claim.

6. Finally, some quick observations regarding the references:

(a) Billingsley is referenced twice (maybe you need it because of some specific reason).

(b) Should S. Kim be S.-H. Kim (not sure but just thought I would mention this)

(c) "automatic control" should be "Automatic Control"