

Many computer experiments involve a large number of input factors, but many of them are inert and only a subset are important. This paper developed a new sequential design framework which can accommodate multiple responses and quickly screen out inert factors so that the final space-filling design is close to optimal with respect to the active factors. By folding over Latin hypercube designs with sliced structure, the new sequential design can have flexible sample size in each stage and also ensures that each stage as well as the whole combined design are all approximately Latin hypercube designs. The new sequential framework does not require prescribing the total sample size, and under the presence of inert factors, it can lead to substantial savings in simulation resources. Even if all the factors are important, the proposed sequential design can still achieve similar overall space-filling property compared to a maximin Latin hypercube design optimized in a single stage.