A THREE STAGE METHOD FOR SELECTING A GOOD SIMULATED SYSTEM

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Abstract:

We consider the problem of selecting the stochastic system that has the best (maximum or minimum) expected performance measure when the number of alternatives is finite but large. Ranking and selection, and multiple comparisons methods have been used successfully for solving problems with small number of alternatives (say 2 to 20). In this work, we propose two methods for solving this problem. In the first method, we consider the objective of selecting the best among a large size of alternative systems. This approach consists of three stages, the first stage uses ordinal optimization for selecting a small subset that contains the best alternative with high probability. In the second and the third stages, we use ranking and selection methods to select a system among the smaller subset as the overall best system. In the second method, the objective is to select a subset that contains a specific number of systems that belong to the top m% best systems. The method uses ordinal optimization in the first stage to select a small subset that contains some of the best systems with high probability. Then in the second stage, we use one of two approaches; in the first approach we use ranking and selection and in the second approach, we use the optimal computing budget allocation. Finally, we implement our methods for solving some numerical examples. The results show that these methods indeed made the correct selection with high probability.