

Universally optimal designs for two interference models

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A systematic study is carried out regarding universally optimal designs under the interference model, previously investigated by Kunert and Martin (2000) and Kunert and Mersmann (2011). Parallel results are also provided for the unidirectional interference model, where the left and right neighbor effects are equal. It is further shown that the efficiency of any design under the latter model is at least its efficiency under the former model. Designs universally optimal for both models are also identified. Most importantly, this paper provides Kushner's type linear equations system as a necessary and sufficient condition for a design to be universally optimal. This result is novel for models with at least two sets of treatment-related nuisance parameters, which are left and right neighbor effects here. It sheds light on other models in deriving non-symmetric optimal or efficient designs.