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Universally optimal designs for two interference models. (English) Zbl 1314.62173

Summary: A systematic study is carried out regarding universally optimal designs under the interference model, previously investigated by J. Kunert and R. J. Martin [Ann. Stat. 28, No. 6, 1728–1742 (2000; Zbl 1103.62358)] and J. Kunert and S. Mersmann [J. Stat. Plann. Inference 141, No. 4, 1623–1632 (2011; Zbl 1204.62131)]. Parallel results are also provided for the undirectional 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 asymmetric optimal or efficient designs.

MSC:
62K05 Optimal statistical designs
62J05 Linear regression; mixed models

Keywords:
approximate design theory; interference model; linear equations system; pseudo symmetric designs; universally optimal designs

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References:


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