

Flexible sliced designs for computer experiments

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Abstract Sliced Latin hypercube designs are popularly adopted for computer experiments with qualitative factors. Previous constructions require the sizes of different slices to be identical. Here we construct sliced designs with flexible sizes of slices. Besides achieving desirable one-dimensional uniformity, flexible sliced designs (FSDs) constructed in this paper accommodate arbitrary sizes for different slices and cover ordinary sliced Latin hypercube designs as special cases. The sampling properties of FSDs are derived and a central limit theorem is established. It shows that any linear combination of the sample means from different models on slices follows an asymptotic normal distribution. Some simulations compare FSDs with other sliced designs in collective evaluations of multiple computer models.

Keywords Central limit theorem · Latin hypercube design · Sampling property · Sliced design

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