

A simple approach to constructing quasi-Sudoku-based sliced space-filling designs

Diane Donovan¹ · Benjamin Haaland^{2,3} ·
David J. Nott⁴

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Abstract Sliced Sudoku-based space-filling designs and, more generally, quasi-sliced orthogonal array-based space-filling designs are useful experimental designs in several contexts, including computer experiments with categorical in addition to quantitative inputs and cross-validation. Here, we provide a straightforward construction of doubly orthogonal quasi-Sudoku Latin squares which can be used to generate quasi-sliced orthogonal arrays and, in turn, sliced space-filling designs which achieve uniformity in one- and two-dimensional projections for the full design and uniformity in two-dimensional projections for each slice. These constructions are very practical to implement and yield a spectrum of design sizes and numbers of factors not currently broadly available.

Keywords Computer experiments · Space-filling designs · Sudoku · Sliced experimental designs

✉ Benjamin Haaland
bhaaland3@gatech.edu

¹ Department of Mathematics, University of Queensland, Brisbane St Lucia, QLD 4072, Australia

² H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology, 755 Ferst Drive, NW, Atlanta 30332, GA, USA

³ Centre for Quantitative Medicine, Duke-NUS Graduate Medical School, 8 College Road, Singapore 169857, Singapore

⁴ Department of Statistics and Applied Probability, National University of Singapore, Singapore 117546, Singapore