Searching good permutations for low-discrepancy sequences by mixed integer programming

Hozumi Morohosi
National Graduate Institute for Policy Studies
morohosi@grips.ac.jp

This talk reports an experience using optimization software to find good permutations giving small discrepancies for generalized van der Corput sequences. Based on Faure's Ψ function [1], we formulate a mixed integer programming that minimizes the maximum of the function. Recent optimization software successfully solves problems in large-size permutations. Some computational experiment results will show how our model searches for good permutations, where some heuristics, such as the symmetry condition, cf. [2], work efficiently to reduce computational time.

[1] Faure, H.: Discrépances de suites associées à un système de numération (en dimension un), *Bull. Soc. Math. France*, **109**(1981), 143–182.

[2] Pausinger, F.: On the intriguing search for good permutations, *Uniform Distribution Theory*, **14**(2019), 53–86.