Abstract

Existing data sets for function approximation such as the Chebyshev grid, Monte Carlo set, quasi-Monte Carlo sets, etc. suffer from geometry dependency and small sample bias. Inspired by the optimal data centers for radial basis function interpolation. We propose a new category of sets called the "ϵ-distinguishable" set(EDS) which is geometry-independent and good for any size. The Experiments in this paper show that EDS can compete with widely used sets such as the Chebyshev grid, Monte Carlo set, quasi-Monte Carlo sets, etc.. Function approximation using EDS can greatly reduce the number of function evaluations needed when the target function is costly to evaluate.