Loeppky, Jason L.; **Moore, Leslie M.**; **Williams, Brian J.**
Batch sequential designs for computer experiments. (English) Zbl 1185.62142
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Summary: Computer models simulating a physical process are used in many areas of science. Due to the complex nature of these codes it is often necessary to approximate the code, which is typically done using a Gaussian process. In many situations the number of code runs available to build the Gaussian process approximation is limited. When the initial design is small or the underlying response surface is complicated this can lead to poor approximations of the code output. In order to improve the fit of the model, sequential design strategies must be employed. We introduce two simple distance based metrics that can be used to augment an initial design in a batch sequential manner. In addition we propose a sequential updating strategy to an orthogonal array based Latin hypercube sample. We show via various real and simulated examples that the distance metrics and the extension of the orthogonal array based Latin hypercubes work well in practice.

MSC:

62L05 Sequential statistical design
68U20 Simulation (MSC2010)
05B15 Orthogonal arrays, Latin squares, Room squares
65C60 Computational problems in statistics (MSC2010)

Keywords:

computer experiment; Gaussian process; random function; Latin hypercube sample; maximin distance; entropy

Software:

EGO; Sostools

Full Text: DOI

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