

Supplementary Text

Latin hypercube sampling

Latin hypercube (LH) sampling is a method [1] for generating a distribution of parameter sets from a multidimensional distribution:

- Let x represent a D dimensional parameter vector $x = x_1, x_2, \dots, x_D$. D is also the number of parameters in our ODE model.
- When sampling for M parameter vectors (sets), the range of each parameter is divided into $M > 1$ mutually exclusive intervals.
- One sample point is randomly selected from each interval for the first parameter x_1 . Hence, M values are sampled: $x_{1,1}$ through $x_{1,M}$. These values are paired with M values sampled for the second parameter x_2 randomly without replacement, which means that each x_2 value is paired with only one value of x_1 .
- Then, these M pairs are combined with M values of x_3 , once again without replacement and M triplets are obtained.
- This procedure is continued until M D -tuplets are generated.

LHS provides a fairly uniform coverage of each parameter range by dividing each range into a number of intervals. The number of intervals is equal to the number of samples.

References

1. Santner TJ, Williams B, Notz W: *The Design and Analysis of Computer Experiments*. Springer-Verlag 2003.