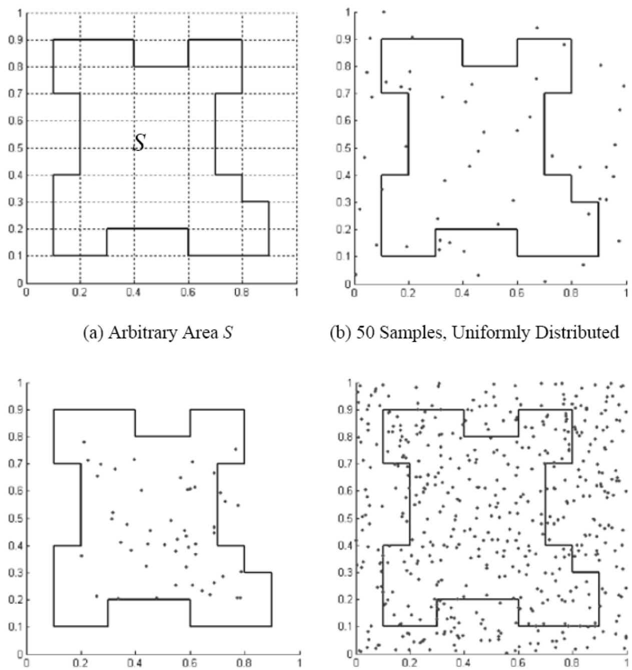
Monte Carlo Simulation

MCS dates back to about 1944 when von Neumann and Ulam introduced it as a code name for the secret work on nuclear weapons at the Los Alamos Scientific Laboratory



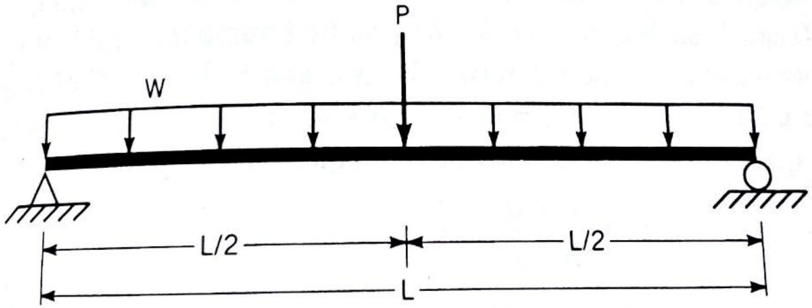
(a) Arbitrary Area S (b) 50 Samples, Uniformly Distributed

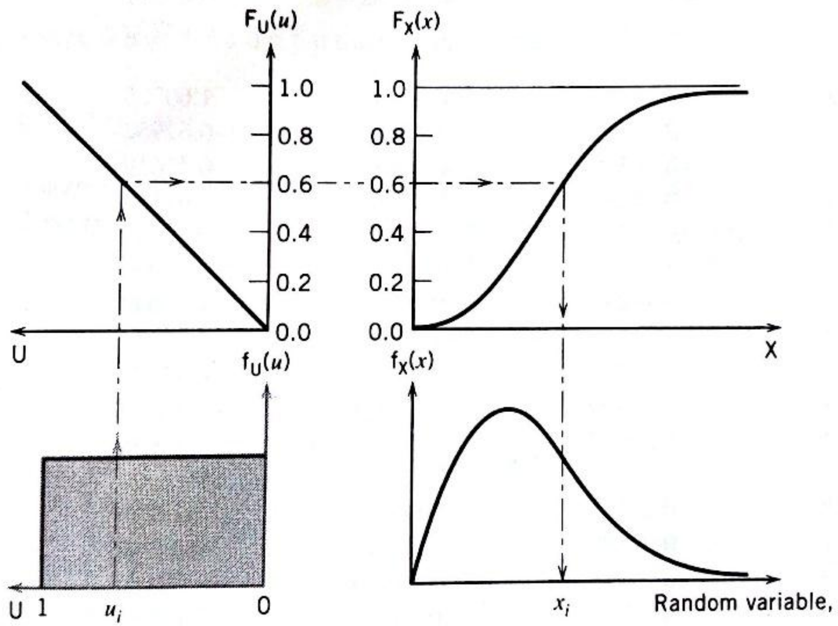
(c) 50 Samples, Aimed at the Center (d) 500 Samples, Uniformly Distributed

Figure 3.6. Example of "Hit or Miss" Method

1. Define problem & RVs (w/ pdfs)
2. Generate random samples
3. Evaluate g(x)<0
4. Extract probabilistic information
5. Determine the accuracy and efficiency of the result

Monte Carlo Simulation cont'd





1. Define problem & RVs (w/ pdfs)
2. Generate random samples
3. Evaluate g(x)<0
4. Extract probabilistic information
5. Determine the accuracy and efficiency of the result

Latin Hypercube Sampling (LHS)

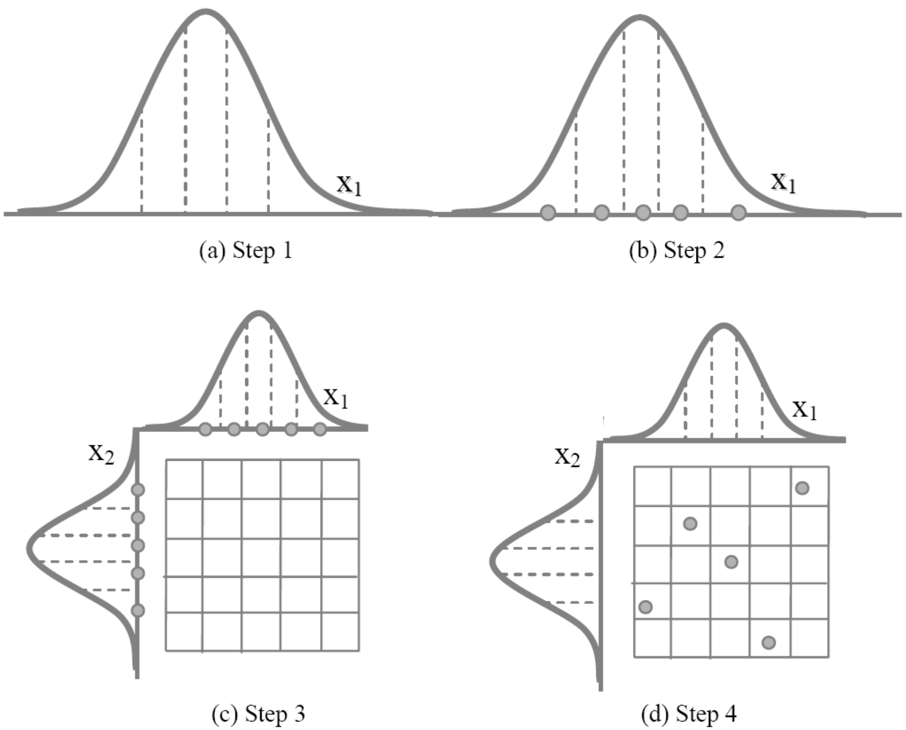


Figure 3.9. Basic Concept of LHS: Two Variables and Five Realizations

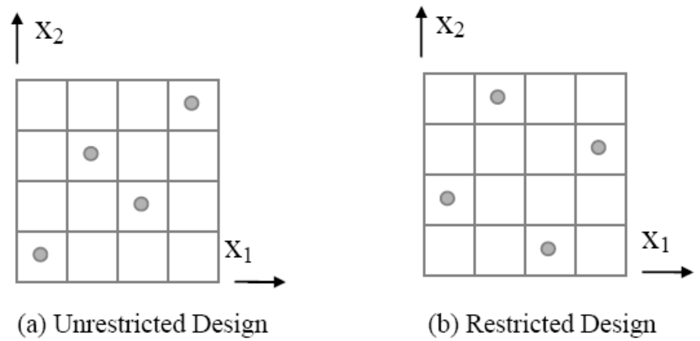


Figure 3.10. Two-dimensional LHS Designs for Four Realizations