

# Testing Random- Number Generators

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Audio/Video recordings of this lecture are available at:

<http://www.cse.wustl.edu/~jain/cse574-08/>



1. Chi-square test
2. Kolmogorov-Smirnov Test
3. Serial-correlation Test
4. Two-level tests
5. K-dimensional uniformity or k-distributivity
6. Serial Test
7. Spectral Test

# Testing Random-Number Generators

Goal: To ensure that the random number generator produces a random stream.

- Plot histograms
- Plot quantile-quantile plot
- Use other tests
- Passing a test is necessary but not sufficient
- Pass  $\neq$  Good
  - Fail  $\Rightarrow$  Bad
- New tests  $\Rightarrow$  Old generators fail the test
- Tests can be adapted for other distributions