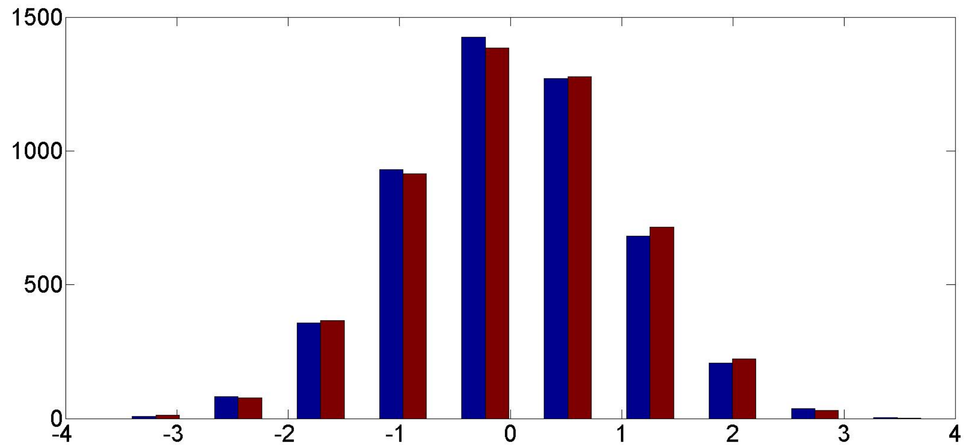

Figure 12.5: Histogram of a pair of normal random variables generated by Box-Muller transformation

12.4 MATLAB Commands for Special Distributions

In this section, we will see some useful commands for commonly employed distributions. To be as precise as possible, we repeat the description of the commands from MATLAB help [2].

12.4.1 Discrete Distributions

- Binomial Distribution:

  Y = binopdf(X,N,P)

  computes the binomial pdf at each of the values in X (vector) using the corresponding number of trials in N and probability of success for each trial in P. Y, N, and P can be vectors, matrices, or multidimensional arrays that all have the same size. A scalar input is expanded to a constant array with the same dimensions of the other inputs.

  Y = binocdf(X,N,P)

  computes a binomial cdf at each of the values in X using the corresponding number of trials in N and probability of success for each trial in P. X, N, and P can be vectors, matrices, or multidimensional arrays that are all the same size. A scalar input is expanded to a constant array with the same dimensions of the other inputs. The values in N must all be positive integers, the values in X must lie on the interval [0,N], and the values in P must lie on the interval [0, 1].

  R = binornd(N,P)

  generates random numbers from the binomial distribution with parameters specified by the number of trials, N, and probability of success for each trial, P. N and P can be vectors, matrices, or multidimensional arrays that have the same size, which is also the size of R.

A scalar input for N or P is expanded to a constant array with the same dimensions as the other input.

- Poisson Distribution

  Y = poisspdf(X,lambda)

  computes the Poisson pdf at each of the values in X using mean parameters in lambda.

  P = poisscdf(X,lambda)

  computes the Poisson cdf at each of the values in X using the corresponding mean parameters in lambda.

  R = poissrnd(lambda)

  generates random numbers from the Poisson distribution with mean parameter lambda.

- Geometric Distribution

  Y = geopdf(X,P)

  computes the geometric pdf at each of the values in X using the corresponding probabilities in P.

  Y = geocdf(X,P)

  computes the geometric cdf at each of the values in X using the corresponding probabilities in P.

  R = geornd(P)

  generates geometric random numbers with probability parameter P. P can be a vector, a matrix, or a multidimensional array.

12.4.2 Continuous Distributions

- Normal Distribution:

  Y = normpdf(X,mu,sigma)

  computes the pdf at each of the values in X using the normal distribution with mean mu and standard deviation sigma.

  P = normcdf(X,mu,sigma)

  computes the normal cdf at each of the values in X using the corresponding mean mu and standard deviation sigma.