Characteristics of Multiple Random Variables

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Based on
Probability, Random Variables and Random Signal Principles,
P.Z. Peebles,Jr. and B. Shi

Outline

Estimate of mean
N Gaussian random variables

Definition

$$\hat{\bar{x}}_N = \frac{1}{N}\sum_{n=1}^{N} x_n$$

$$\hat{\bar{X}}_N = \frac{1}{N}\sum_{n=1}^{N} X_n$$

Mean of the estimate of mean

N Gaussian random variables

Definition

$$E\left[\hat{X}_N\right] = E\left[\frac{1}{N}\sum_{n=1}^{N} X_n\right] = \frac{1}{N}\sum_{n=1}^{N} E\left[X_n\right] = \overline{X}$$