

Probability

Axioms

Random Variables

Discrete

Continuous

Mixed

Distributions

Marginal, Joint, Conditional

Bayes Rule

Expect Value

Mean

Variance

Covariance

Correlation coefficient

Characteristic and moment generating functions

Random vectors

Mean Vector

Covariance Matrix

Multivariate Gaussian RVs

Linear Transformations of Multivariate Gaussian RVs

Linear transformation to form i.i.d. Gaussian components

Conditional Probabilities

Nonlinear Transformations of RVs

Bounds and Approximations

Chebyshev Inequality

Chernoff Bound

Sequences of RV's

Central Limit Theorem

Random Processes

Definition

Autocorrelation function- $R_{xx}(t_1, t_2)$

Autocorrelation function $R_{XX}(\tau)$

Properties of $R_{XX}(\tau)$

Finding μ_X and σ_X given $R_{XX}(\tau)$

Example RPs

Cosine RP

Random Binary Waveform

Markov Processes

Gaussian Processes

Properties

$R_{XX}(\tau)$ and conditional probabilities

Stationarity

SSS

WSS