EE 497B

Probability and Random Processes for Electrical Engineers

Lecture 34

Professor Jeffrey Schiano
Department of Electrical Engineering

Penn State ELECTRICAL ENGINEERING

Lecture 34 Topics

- Random Vectors
  - Expected Value Vector and Correlation Matrix

- Sum of Independent Random Variables
  - Chapter 6: Sections 6.1 and 6.2

Expected Value Vector and Matrix

- ***Definition 5.11:*** The expected value of a random vector X is a column vector

$$E[\bar{X}] = \bar{\mu}_{\bar{X}} = \begin{pmatrix} E[X_1] \\ \vdots \\ E[X_n] \end{pmatrix} = (E[X_1] \quad \cdots \quad E[X_n])^T$$

- ***Definition 5.12:*** For a random matrix A with a random variable A_{ij} as its i^{th}, j^{th} element, E[A] is a matrix with i^{th}, j^{th} element $E[A_{ij}]$