Mid exam: PCE 6205,Stochastic model, estimation and control .Professor Seungnam kim

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1. Minimum Variance Estimator

Suppose a random variable is the sum of two random independent variables , as , where the pdfs of and are defined as

* 1. For the random variable
     1. Calculate the pdf of z, and draw pdf of
     2. Calculate the mean of , and draw
  2. After measurement of , to find the minimum variance estimator of , answer the following questions
     1. Find the joint pdf of
     2. Find the conditional expectation of given and draw
  3. Verify the iterated expectation rule using this example,

1. Independence and disjoint event

Let , consider

Define

* 1. Which events are independent? Verify your answer.
  2. Which events are disjoint(orthogonal)? Verify your answer.

1. Gaussian RV

Let be a Gaussian random vectors with mean and covariance .

3.1. If , where is a Guassian random vectors with mean zero and covariance

and are independent. Find the mean and variance of RV .

Answer Sheet 1/3

Answer Sheet 2/3

Answer Sheet 3/3