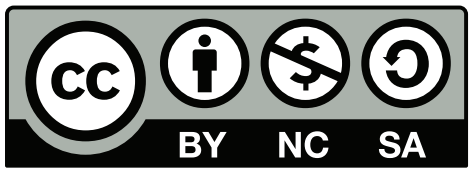
Characteristics of Multiple Random Variables

Young W Lim

June 27, 2019



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

Outline

Bivariate Gaussian Density
one function

Definition

The probability distribution and probability density functions of Y=g(X_1, ..., X_N)
The probability distribution

$$F_Y(y) = P\{Y \le y\} = P\{g(X_1, ..., X_N) \le y\}$$

this probability is associated with all points in the $(x_1, x_2, ..., x_N)$ hyperspace that map such that $g(X_1, ..., X_N) \le y$ for any y integrate all such points according to

$$F_Y(y) = P\{g(X_1, ..., X_N) \le y\}$$

$$= \int \cdots \int_{g(X_1,...,X_N) \le y} f_{x_1,\cdots,x_N}(x_1, \cdots, x_N) dx_1 \cdots dx_N$$