Jointly Gaussian Random Variables with Different Correlation Coefficients (0.5,0 ,-0.75)

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Prepared by Dr. Ali Muqaibel (code next page)

% Dr. Ali Hussein Muqaibel

% Two dimensional Gaussian

clc

clear all

close all

x=-3:0.1:3;

y=-3:0.1:3;

X\_mean=0;

Y\_mean=0;

segma2\_X=1;

segma2\_Y=1;

p=-0.75; % try 0.5 and -0.5 and take a cross section of the pdf do

% you get a circle or an ellipse

N=2;

CX=[segma2\_X p\*sqrt(segma2\_X\*segma2\_Y); p\*sqrt(segma2\_X\*segma2\_Y) segma2\_X];

iCX=inv(CX);

cc=sqrt(det(iCX))/(2\*pi)^(N/2);

for k=1:length(x)

for n=1:length(y)

z(k,n)=cc\*exp(-([x(k)-X\_mean; y(n)-Y\_mean]'\*iCX\*[x(k)-X\_mean; y(n)-Y\_mean])/2);

end

end

surfc(x,y,z)

xlabel ('X')

ylabel ('y')

zlabel ('pdf')