Marginal Distributions

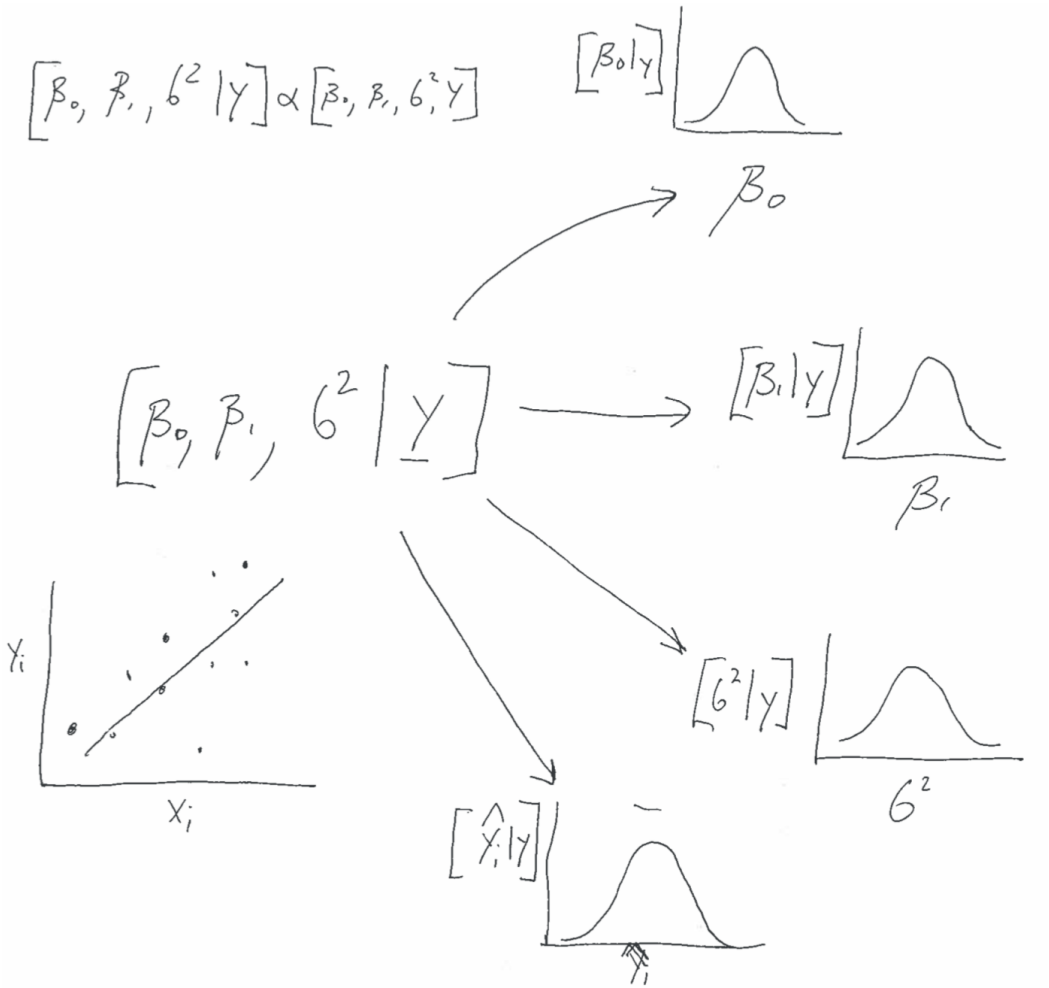
Models for Socio-Environmental Data

Chris Che-Castaldo, Mary B. Collins, N. Thompson Hobbs

August 01, 2019

DBI-1052875, DBI-1639145, DEB 1145200

Marginal distributions: they allow us to isolate the univariate distribution of a variable that is jointly distributed.



Discrete Example

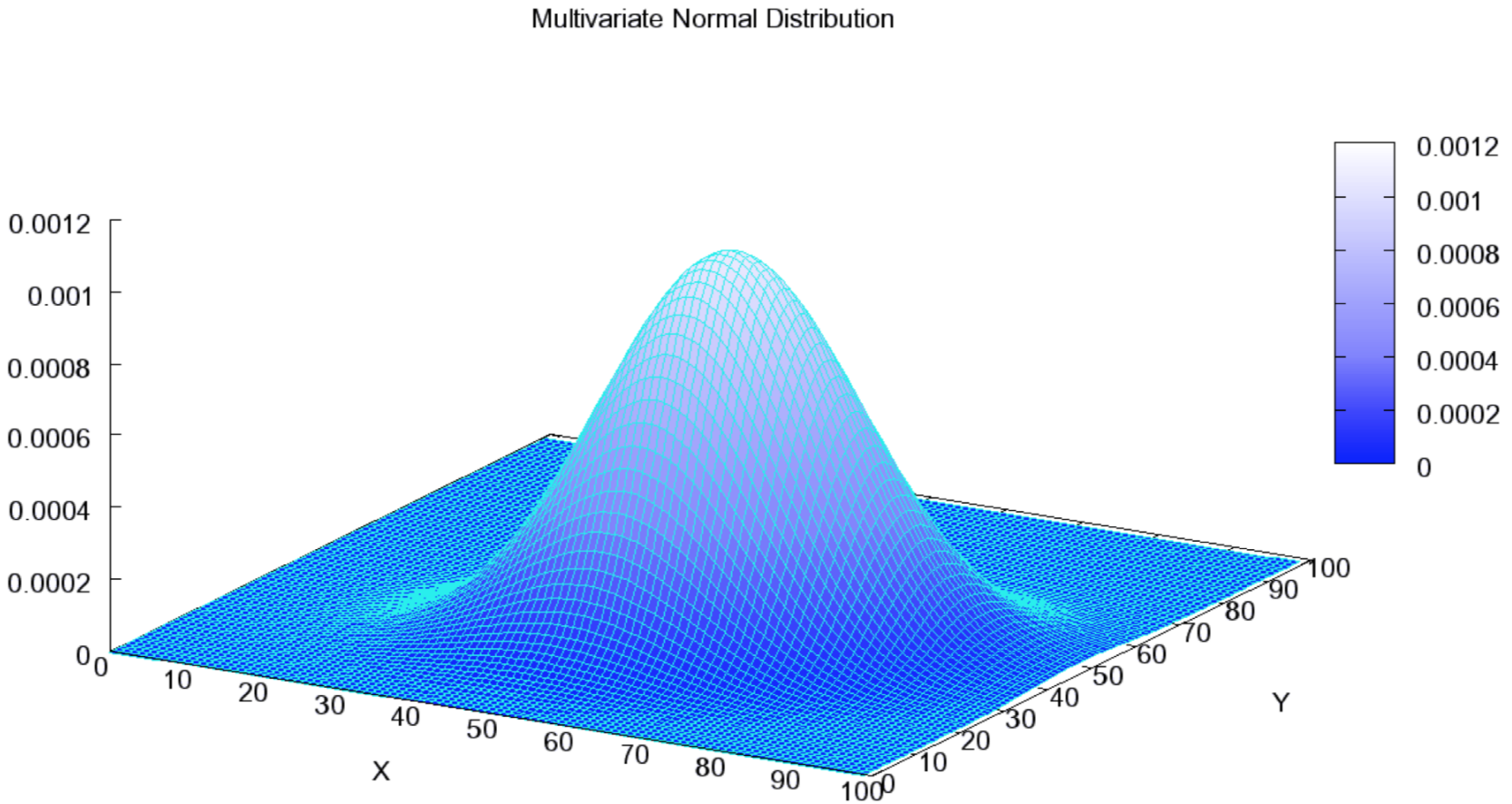
We are studying a species for which births occur in pulses. We observe 100 females and record the age of each animal and the number of offspring produced.

	$y =$ Number offspring			
$x =$ Age	1	2	3	$\sum_y [x, y]$
1	0.1	0	0	0.1
2	0.13	0.12	0.02	0.27
3	0.23	0.36	0.04	0.63
$\sum_x [x, y]$	0.46	0.48	0.06	

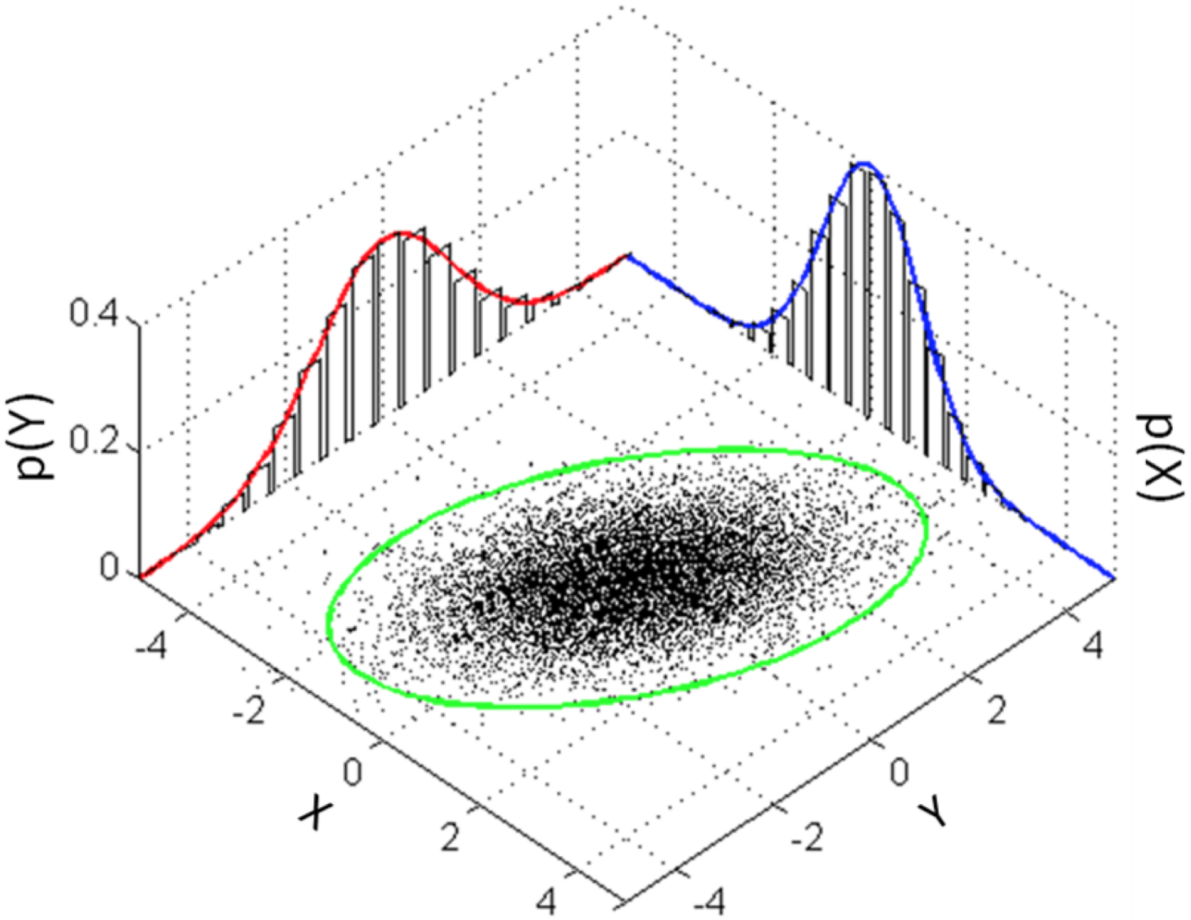
Note:

- The function $[x, y]$ specifies the joint probability of the discrete random variables x and y
- $\Sigma_x[x, y]$ is the marginal probability of y and
- $\Sigma_y[x, y]$ is the marginal probability of x.
- This same idea applies to any number of jointly distributed random variables. We simply sum over all but one.

Joint Distribution of Continuous Random Variables



Marginal Distribution of Continuous Random Variables



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Work on lab

Complete Probability Lab #3