Exercise: Conditional PDF

(2/2 points)

The random variables X and Y are jointly continuous, with a joint PDF of the form

$$f_{X,Y}(x,y) = \begin{cases} cxy, & \text{if } 0 \le x \le y \le 1, \\ 0, & \text{otherwise,} \end{cases}$$

where c is a normalizing constant.

a) Is it true that $f_{X|Y}(2 \mid 0.5)$ is equal to zero?

Yes ✔ **Answer:** Yes

b) Is it true that $f_{X|Y}(0.5 \mid 2)$ is equal to zero?

No ✔ **Answer:** No

Answer:
a) Values of Y around 0.5 have positive probability, so that $f_Y(0.5) > 0$, and $f_{X|Y}(2 \mid 0.5)$ is therefore well-defined. But $x = 2$ is outside the range of values of X, and $f_{X,Y}(2, 0.5) = 0$, from which it follows that $f_{X|Y}(2 \mid 0.5) = 0$.

b) Since $y = 2$ is outside the range of values of Y, we have $f_Y(2) = 0$, and the conditional PDF $f_{X|Y}(0.5 \mid 2)$ is undefined.

You have used 1 of 1 submissions

Lec. 10: Conditioning on a random variable; Independence; Bayes' rule
Exercises 10 due Mar 16, 2016 at 23:59 UT

Standard normal table

Solved problems

Problem Set 5
Problem Set 5 due Mar 16, 2016 at 23:59 UT

Unit summary