

Probability Review Topics

1D distributions

discrete (pmf) vs continuous (pdf)

normalized vs unnormalized

examples [1 2 1] ; uniform(0,1); $1-x^2 \mid -1 \leq x \leq 1$; $N(0,1)$

2D (bivariate) distributions

joint distribution (with examples of discrete and continuous)

examples [0 5 5; 10 0 0; 2 4 6];

[1 1 1; 1 1 1; 1 1 1];

[1 2 1; 2 4 2; 1 2 1];

bivariate Gaussian

marginal distributions

conditional distributions

independence

conditional independence

Multivariate distributions

(vector of random variables $X=[x_1 \ x_2 \ x_3 \ \dots \ x_n]$)

Cumulative Distribution Function (cdf)

[note: tie in with integral images!]

Expectation / Expected Values

moments and central moments

mean, variance, covariance

"one-pass" computation of central moments

(useful for sequences / time series)

moments of binary images = shape descriptors