Multivariate probabilty and statistics

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Date of Presentation

Overview

This presentation is ..

Random variables

Random variable is...

Random vectors

Random vector is...

Probability density

(Function, Examples)

Marginal and joint probabilities

(Definition, examples)

Conditional probabilities

(continuous case, discrete case)

Independence

definition

Expectation

(continuous, discrete (maybe otherway around would be more intuitive?))

Variance and covariance

(dim $= 1$, covariance matrix)

Independence and covariance

the relation

Bayesian inference

Baye's rule

Non informative priors

definition

Bayesian inference as a incremental learning process

Explanation

Parameter estimation and likelihood

(statistical model, estimation, ilkelihood & log-lkelihood)

Maximum likelihood and maximum posteriori

(definition, definition)

Template examples

Examples from the template on the next slides:

Tables and Figures

- Use `tabular` for basic tables — see Table 1, for example.
- You can upload a figure (JPEG, PNG or PDF) using the files menu.
- To include it in your document, use the `includegraphics` command (see the comment below in the source code).

Item	Quantity
Widgets	42
Gadgets	13

Table 1: An example table.

Readable Mathematics

Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n} \sum_{i}^{n} X_i$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.