Why

We name the image measure of a collection of real-valued random variables.

Definition

The *joint law* of an ordered finite family of n real-valued random variables is the image measure of the tuple-valued function whose components are the individual random variables.

Notation

Let R denote the set of real numbers and let R^n denote set of n-tuples of real numbers. Let $f_1, \ldots, f_n$ be random variables defined on a probability space $(X, \mathcal{A}, \mu)$. Define $f : X \to R^n$ by $(f(x))_i = f_i(x)$. The joint law is the image measure of f.

We denote the joint law of $\{f_i\}$ by $\mu_{f_1,\ldots,f_n} : \mathcal{A} \to [0, \infty]$. We defined it by

$$\mu_{f_1,\ldots,f_n}(A) = \mu(\{x \in X \mid f(x) \in A\}).$$

for all A in the topological sigma algebra on R^n.

Random Variables Joint Law

Random Variable Laws

Image Measures

Measures

Extended Real Numbers

Topological Sigma Algebra

Real Limits

Topological Spaces

Real Sequences

Intervals

Metrics

Subset Algebras

Sequences

Real Numbers

Distance

Set Operations

Cardinality

Direct Products

Rational Numbers

Length Common Notions

Algebras

Injective Functions

Natural Families

Natural Order

Integer Numbers

Operations

Families

Function Composites

Zero

Subset Systems

Power Set

Set Symmetric Differences

Functions

Natural Numbers

Equation Solutions

Set Unions

Relations

Set Intersections

Set Complements

Ordered Pairs

Unordered Pairs

Empty Set

Equations

Set Specification

Set Inclusion

Sentences

Set Equality

Sets

Standardized Accounts

Identity

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Objects

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