Why

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

Definition

The *joint law* of a sequence of n real-valued random variables is the image measure of the tuple-valued function whose components are the individual random variables.

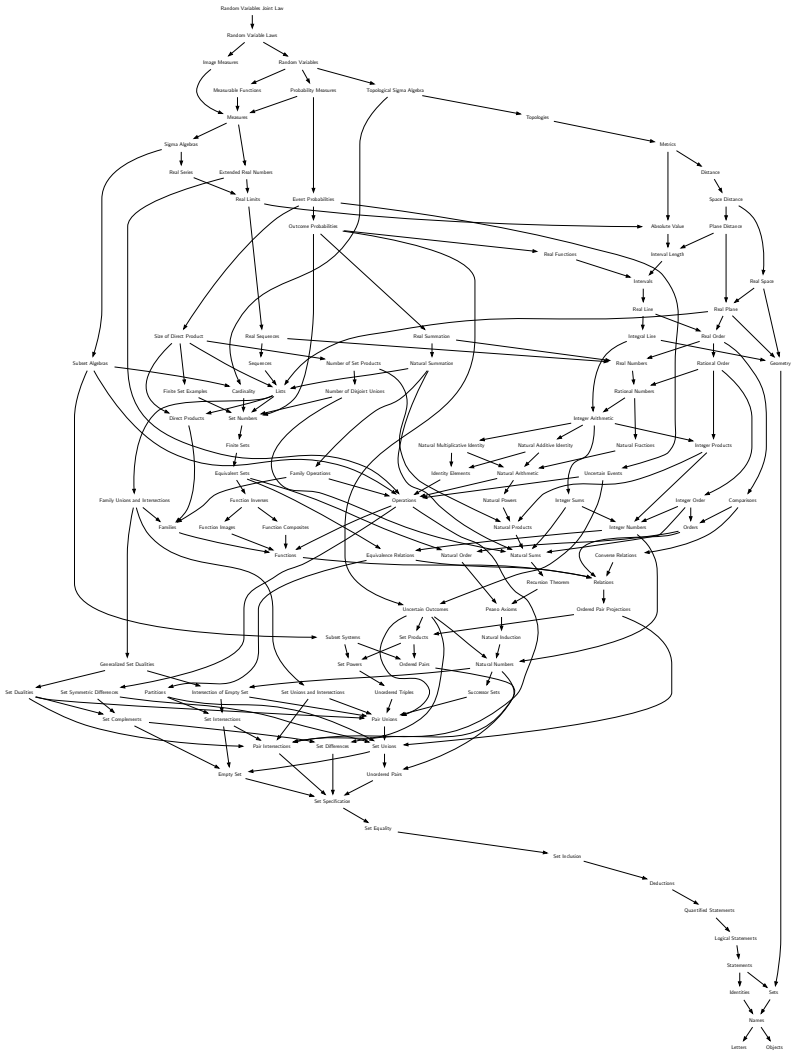
Notation

Let $(X, \mathcal{A}, \mu)$ be a probability space and $(Y, \mathcal{B})$ be a measurable space. Let $f_1, \ldots, f_n : X \to Y$ be random variables. Define $f : X \to Y^n$ 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 product sigma algebra on Y^n.


Random Variable Joint Law
Random Variable Laws
Image Measures
Random Variables
Measurable Functions
Probability Measures
Topological Sigma Algebra
Topologies
Measures
Metrics
Sigma Algebra
Distance
Real Sums
Extended Real Numbers
Space Distance
Real Limits
Event Probabilities
Absolute Value
Plane Distance
Outcome Probabilities
Real Functions
Interval Length
Intervals
Real Space
Real Line
Real Plane
Integral Line
Real Order
Size of Direct Product
Real Sequences
Real Summation
Subset Algebra
Sequences
Number of Set Products
Natural Summation
Real Numbers
Rational Order
Geometry
Finite Set Examples
Cardinality
Lists
Number of Disjoint Unions
Rational Numbers
Direct Products
Set Numbers
Integer Arithmetic
Finite Sets
Natural Multiplicative Identity
Natural Additive Identity
Natural Fractions
Integer Products
Equivalent Sets
Family Operations
Identity Elements
Natural Arithmetic
Uncertain Events
Family Unions and Intersections
Function Inverses
Operations
Natural Powers
Integer Sums
Integer Order
Comparisons
Families
Function Images
Function Composites
Natural Products
Integer Numbers
Order
Functions
Equivalence Relations
Natural Order
Natural Sums
Convexe Relations
Recursion Theorem
Relations
Uncertain Outcomes
Peano Axioms
Ordered Pair Projections
Subset Systems
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Ordered Pairs
Natural Numbers
Set Dualities
Set Symmetric Difference
Partitions
Intersection of Empty Set
Set Unions and Intersections
Unordered Triples
Successor Sets
Set Complements
Set Intersections
Pair Unions
Pair Intersections
Set Differences
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects