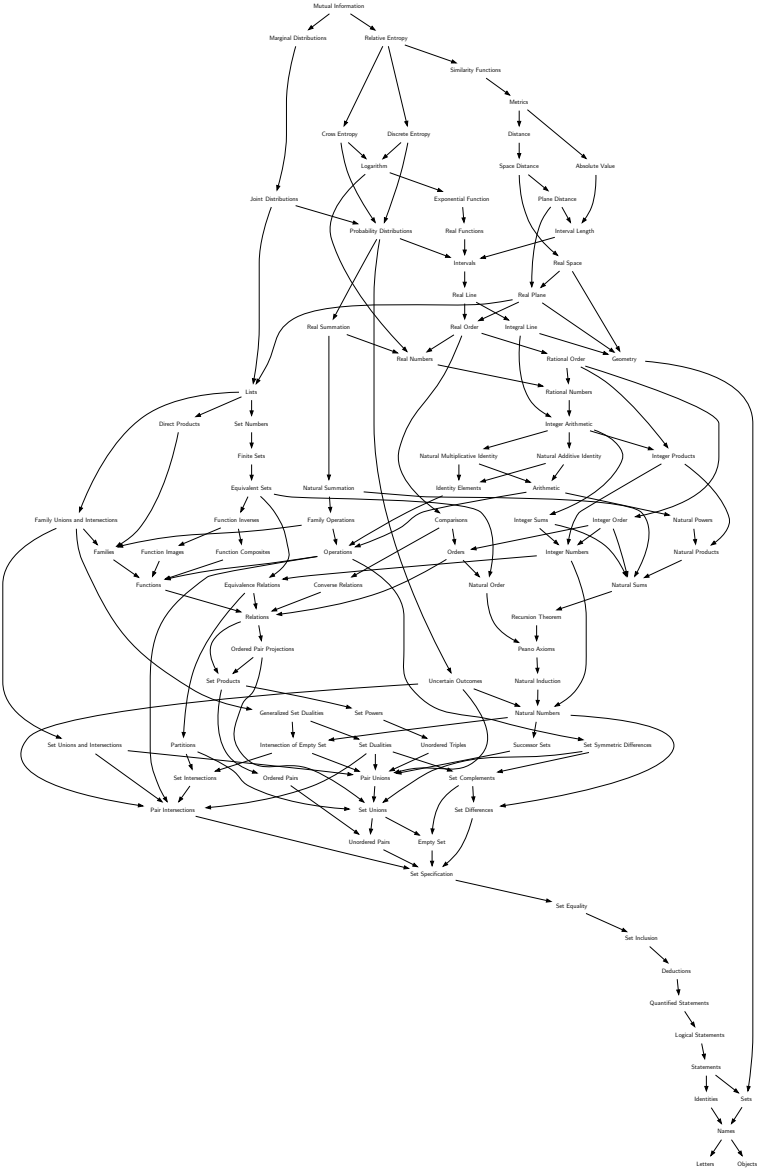
Definition

The mutual information of a joint distribution over two random variables is the entropy of the product of the marginal distributions relative to the joint distribution.

Notation

Let A and B be two non-empty sets. Let $p_{12} : A \times B \to \mathbf{R}$ be a distribution with marginal distributions $p_1 : A \to \mathbf{R}$ and $p_2 : B \to \mathbf{R}$. The mutual information of p is $d(p, p_1 p_2)$ where d denotes the relative entropy.


Mutual Information
Marginal Distributions
Relative Entropy
Similarity Functions
Metrics
Cross Entropy
Discrete Entropy
Distance
Logarithm
Space Distance
Absolute Value
Joint Distributions
Exponential Function
Plane Distance
Probability Distributions
Real Functions
Interval Length
Intervals
Real Space
Real Line
Real Plane
Real Summation
Real Order
Integral Line
Real Numbers
Rational Order
Geometry
Lists
Rational Numbers
Direct Products
Set Numbers
Integer Arithmetic
Finite Sets
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Equivalent Sets
Natural Summation
Identity Elements
Arithmetic
Family Unions and Intersections
Function Inverses
Family Operations
Comparisons
Integer Sums
Integer Order
Natural Powers
Families
Function Images
Function Composites
Operations
Orders
Integer Numbers
Natural Products
Functions
Equivalence Relations
Converse Relations
Natural Order
Natural Sums
Relations
Recursion Theorem
Ordered Pair Projections
Peano Axioms
Set Products
Uncertain Outcomes
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Dualities
Unordered Triples
Successor Sets
Set Symmetric Differences
Set Intersections
Ordered Pairs
Pair Unions
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects