Why

We want to select a distribution graph to summarize some data.

Definition

Let (G, A) be a typed graph on $\{1, \ldots, n\}$. Let $S \subset \{1, \ldots, n\}$. Let $x^1, \ldots, x^n$ be a dataset in $A_S = \prod_{j \in S} A_j$ (see Function Graphs).

A *distribution graph selector* for typed graph (G, A), dataset of size n, and indices $S \subset \{1, \ldots, n\}$ is a function from datasets of size n in A_S to distribution graphs on (G, A).

In the case that $S \neq \{1, \ldots, n\}$ we call S the *observable* (or *data*) indices and $T = \{1, \ldots, n\} - S$ the *hidden* (or *latent, nonobservable*) indices. It is common for many authorities to use the notational convention Z for A_T and X for A_S.

Let $p : \prod_i A_i \to [0, 1]$ denote the full joint distribution of a distribution graph. In this case, we call $p_S : A_S \to [0, 1]$ the *observable distribution* (or *evidence distribution*).

Distribution Graph Selector

Parameterized Distribution Graphs

Parameterized Distributions

Distribution Families

Probability Densities

Real Integrals

Nonnegative Integrals

Simple Integrals

Measurable Functions

Measures

Sigma Algebras

Real Series

Extended Real Numbers

Real Limits

Conditional Event Probabilities

Simple Functions

Absolute Value

Event Probability

Maximum Likelihood Distributions

Real Sequences

Real Functions

Interval Length

Probability Distributions

Intervals

Real Line

Optimizers

Real Order

Real Summation

Rational Order

Real Numbers

Integral Line

Rational Numbers

Integer Arithmetic

Integer Products

Natural Additive Identity

Natural Multiplicative Identity

Natural Summation

Equivalent Sets

Integer Sums

Integer Order

Arithmetic

Identity Elements

Comparisons

Family Operations

Function Inverses

Family Unions and Intersections

Integer Numbers

Natural Powers

Orders

Operations

Function Image

Function Composites

Families

Natural Products

Natural Order

Equivalence Relations

Converse Relations

Functions

Natural Sums

Characteristic Functions

Recursion Theorem

Relations

Set Products

Subset Systems

Peano Axioms

Set Powers

Ordered Pairs

Natural Induction

Uncertain Outcomes

Natural Numbers

Unordered Triples

Generalized Set Dualities

Set Symmetric Differences

Successor Sets

Set Dualities

Intersection of Empty Set

Partitions

Set Unions and Intersections

Set Complements

Pair Unions

Set Intersections

Pair Intersections

Set Differences

Set Unions

Geometry

Empty Set

Unordered Pairs

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets

Identities

Names

Letters

Objects

Distribution Graphs

Directed Graph Distributions

Hidden Memory Chain

Memory Chains

Rooted Tree Distributions

Conditional Distributions

Magical Distributions

Rooted Trees

Directed Graphs

Function Graphs

Joint Distributions

Trees

Undirected Paths

Sequences

Lists

Undirected Graphs

Set Numbers

Direct Products

Subset Algebras

Cardinality

Finite Sets

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