Why

We want to summarize a dataset with a distribution.

Overview

The *likelihood* (or *distribution likelihood*) of a probability distribution $p : A \to \mathbf{R}$ on a dataset $a^1, \ldots, a^n \in A$ is $\prod_{i=1}^{n} p(a^i)$. A *maximum likelihood distribution* $p^{\star} : A \to \mathbf{R}$ is one which maximizes the likelihood over all distributions on A.

We call the correspondence between datasets and distributions the *maximum likelihood algorithm*. We say that we are selecting the distribution according to the *maximum likelihood principle*. In general, we call any function from datasets to distributions a *distribution selector*.

Maximum Likelihood Distributions

Probability Distributions

Optimizers

Intervals

Real Line

Real Summation

Real Order

Real Numbers

Rational Order

Rational Numbers

Integral Line

Integer Arithmetic

Lists

Set Numbers

Direct Products

Finite Sets

Natural Multiplicative Identity

Natural Additive Identity

Integer Products

Identity Elements

Arithmetic

Equivalent Sets

Natural Summation

Natural Powers

Family Unions and Intersections

Function Inverses

Family Operations

Comparisons

Integer Order

Integer Sums

Natural Products

Families

Function Composites

Function Images

Operations

Orders

Integer Numbers

Natural Sums

Functions

Converse Relations

Equivalence Relations

Natural Order

Recursion Theorem

Relations

Peano Axioms

Set Products

Natural Induction

Uncertain Outcomes

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

Ordered Pairs

Set Intersections

Pair Unions

Set Complements

Pair Intersections

Set Unions

Set Differences

Unordered Pairs

Empty Set

Set Specification

Geometry

Set Equality

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects