Why

We provide a principle for density selection based on maximizing the probability of the dataset.

Definition

Let $(x^1, \ldots, x^n)$ be a dataset in $\mathbf{R}^d$.

The *principle of maximum likelihood* says to solve:

$$\textbf{find} \quad f \text{ a density}$$
$$\textbf{to maximize} \quad \prod_{k=1}^{n} f(x^k)$$

We call a solution of the above problem a *maximum likelihood density*. We call the objective of the above problem *density likelihood*.

Density Maximum Likelihood

Density Selection

Multivariate Real Densities

Probability Densities

N-Dimensional Space

Real Integrals

Distance

Nonnegative Integrals

Simple Integrals

Measurable Functions

Measures

Extended Real Numbers

Maximum Likelihood

Real Limits

Space Distance

Optimizers

Distribution Selection

Simple Functions

Absolute Value

Plane Distance

Total Orders

Datasets

Probability Distributions

Real Functions

Interval Length

Intervals

Real Line

Real Space

Real Plane

Real Summation

Real Sequences

Real Order

Integral Line

Sigma Algebras

Real Numbers

Sequences

Geometry

Set Numbers

Rational Numbers

Finite Sets

Partial Orders

Integer Arithmetic

Direct Products

Natural Additive Identity

Natural Multiplicative Identity

Equivalent Sets

Natural Summation

Identity Elements

Arithmetic

Integer Products

Family Unions and Intersections

Subset Algebras

Family Operations

Natural Powers

Integer Sums

Function Inverses

Set Operations

Algebras

Natural Products

Integer Numbers

Function Composites

Function Images

Natural Order

Operations

Natural Sums

Families

Cardinality

Recursion Theorem

Functions

Equivalence Relations

Peano Axioms

Subset Systems

Cartesian Products

Characteristic Functions

Uncertain Outcomes

Relations

Natural Induction

Ordered Pairs

Set Powers

Natural Numbers

Generalized Set Dualities

Set Symmetric Differences

Successor Sets

Set Dualities

Set Unions and Intersections

Intersection of Empty Set

Partitions

Set Complements

Unordered Triples

Pair Unions

Set Intersections

Set Differences

Set Unions

Pair Intersections

Empty Set

Unordered Pairs

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects