Why

Often there are several good parameters for a predictor.[1]

Definition

A *regularizer* is a nonegative function. Regularizes are sometimes called *penalties*.

For example, least squares predictor with a l_2 regularization is called *ridge regression*.

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[1]Future editions will include a more complete form of this sheet.

Regularizers

Least Squares Linear Regression

Linear Prediction — Norms

Matrix Inverses — Matrix Transpose — Real Function Approximation — Input Designs

Matrix-Matrix Products

Matrix-Vector Products — Linear Transformations — Vector Space Bases — Approximation — Consistent Induction — Loss Functions — Regressors

Real Function Space — Matrices — Linearly Dependent Vectors — Span — Similarity Functions — Inductors

Transformations — Linear Combinations — Subspace — Functionals — Metrics

Vectors — Absolute Value — Datasets

N-Dimensional Space

Real Functions — Distance

Space Distance

Plane Distance

Interval Length

Intervals

Real Line — Real Plane — Real Space

Integral Line — Fields — Real Order — Sequences — Real Optimizers

Geometry — Set Numbers — Groups — Real Numbers — Optimizers

Finite Sets — Integer Additive Inverses — Rational Numbers — Direct Products

Inverse Elements — Integer Arithmetic — Comparisons

Element Functions — Equivalent Sets — Natural Additive Identity — Natural Multiplicative Identity — Integer Sums — Orders — Family Unions and Intersections

Algebras — Function Inverses — Identity Elements — Arithmetic — Integer Products — Natural Order — Families

Function Composites — Function Images — Operations — Natural Powers — Integer Numbers

Converse Relations — Equivalence Relations — Functions — Natural Products

Relations — Natural Sums

Recursion Theorem

Peano Axioms

Natural Induction

Set Products — Natural Numbers — Generalized Set Dualities

Set Powers — Unordered Triple — Intersection of Empty Set — Successor Sets — Set Dualities — Set Unions and Intersections

Partitions — Set Intersections — Pair Unions — Set Complements

Ordered Pairs — Set Unions — Set Differences — Pair Intersections

Unordered Pairs — Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets — Identities

Names

Letters — Objects