Why

Since the function space $\mathbf{R} \to \mathbf{R}$ is a vector space, can we approximate a "complex" element of this set by some basis of "simpler" functions in $\mathbf{R} \to \mathbf{R}$.

Of course, there may be no set that can represent f. So instead we may be interested in an element $g \in \operatorname{span}\{g_1, \ldots, g_d\}$ which approximates f.[1]

Definition

A *real function approximator* for a function $f : \mathbf{R} \to \mathbf{R}$ is a function $g : \mathbf{R} \to \mathbf{R}$.

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[1] Future editions will modify.

Real Function Approximation

Vector Space Bases

Linearly Dependent Vectors · Span

Subspaces

Real Subspaces

Real Function Space · Linear Combinations · Real Vector Span

Vectors · Real Linear Combinations · Approximation

Real Vector · Similarity Functions

N-Dimensional Space · Space Vector · Plane Vector Sums and Differences · Metrics

Distance · Plane Vectors

Real Functions

Space Distance

Plane Distance · Absolute Value

Interval Length

Intervals · Real Space

Real Line · Real Plane · Real Optimism

Integral Line · Real Order

Fields · Geometry · Real Number · Rational Order

Rings · Rational Numbers · Optimism

Integer Arithmetic · Lists

Natural Additive Identity · Natural Multiplicative Identity · Integer Products · Set Numbers

Arithmetic · Identity Elements · Finite Sets

Equivalent Sets · Direct Products

Natural Powers · Function Inverses · Family Unions and Intersections

Integer Sums · Natural Products · Integer Order · Comparisons

Operations · Natural Sums · Integer Number · Orders · Function Composites · Function Images · Families

Recursion Theorem · Converse Relations · Natural Order · Functions · Equivalence Relations

Peano Axioms · Relations

Natural Induction · Set Products

Natural Number · Set Powers · Generalized Set Dualities

Set Symmetric Differences · Successor Sets · Unordered Triples · Set Dualities · Intersection of Empty Set · Partitions · Set Unions and Intersections

Set Complements · Ordered Pairs · Pair Unions · Set Intersection

Set Differences · Set Union · Pair Intersection

Empty Set · Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets · Identities

Names

Letters · Objects