Why

Definition

A *neural network* is a sequence of functions from with several properties. First, the codomain and domain of two subsequence functions in the sequence match. Second, each function is a composition of a function wit We associate a neural network with a predictor which is the composition of the functions in the sequence.

Notation

Let $g^1 : \mathbf{R}^d \to \mathbf{R}^k$, $g^2 : \mathbf{R}^k \to \mathbf{R}^k$, $g^3 : \mathbf{R}^k \to \mathbf{R}^m$. Then (g^1, g^2, g^3) is a neural network. Notice that the codomain of g^1 ($\mathbf{R}^k$

Activation functions

An activation function $h : \mathbf{R} \to \mathbf{R}$ is nonlinear.

Neural Networks

Inductors

Real Numbers

Datasets

Rational Numbers

Sequences

Integer Arithmetic

Direct Products

Set Numbers

Natural Additive Identity

Natural Multiplicative Identity

Finite Sets

Identity Elements

Arithmetic

Equivalent Sets

Operations

Natural Powers

Integer Products

Family Unions and Intersections

Function Inverses

Natural Products

Integer Sums

Families

Function Images

Function Composites

Natural Sums

Integer Numbers

Functions

Equivalence Relations

Natural Order

Recursion Theorem

Relations

Peano Axioms

Cartesian Products

Natural Induction

Generalized Set Dualities

Set Powers

Natural Numbers

Set Unions and Intersections

Set Dualities

Unordered Triples

Intersection of Empty Set

Successor Sets

Partitions

Set Complements

Pair Unions

Set Intersections

Ordered Pairs

Pair Intersections

Set Differences

Set Unions

Empty Set

Unordered Pairs

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects