

Applied artificial intelligence

Relatie AI en Wiskunde

logboek



Inleiding

Machine learning and AI is basically just calculus in disguise, all of the work “under the hood” is done by different implementations of mathematics. Partial derivatives are used in backpropagation, knn uses euclidean distance, activation functions determine the state or activation of a neuron, etc.

Determine errors.

A neural network consists of a bunch of parameters that can be tweaked, biases and weights; these parameters determine the state of the output predictions, when learning the network is tweaked to acquire a desired outcome, the begin state can be random, when faced with regression related problems geometry can be used to determine the error margin between predicted (network output) and target value.

To determine what neuron in a neural network is responsible for changes in output, we use differentiation, chain-rule, power-rule, quotient-rule. Using partial differentiation we can determine how much a given neuron contributes to the error. Using this we can tweak the parameters (weights and biases) of the network to improve the outcome.

Gradient Descent.

Neural networks often require finding the minimum of a given function, to find the point where the least errors occur we can apply gradient descent to find our way to the local minimum of a function. Gradient descent also uses differentiation.