

ABSTRACT

Neural Networks (NN) are important data mining tool used for classification and clustering. It is an attempt to build machine that will mimic brain activities and be able to learn. NN usually learns by examples. If NN is supplied with enough examples, it should be able to perform classification and even discover new trends or patterns in data. Basic NN is composed of three layers, input, output and hidden layer. Each layer can have number of nodes and nodes from input layer are connected to the nodes from hidden layer. Nodes from hidden layer are connected to the nodes from output layer. Those connections represent weights between nodes. This paper describes one of most popular NN algorithms, Back Propagation (BP) Algorithm. The aim is to enhance this algorithm to make it more efficient in terms of speed and accuracy of training by applying new methods in weight adjustment and adding new variables and functions to regularize weight update and to improve error rate detection to produce more reliable outputs. The idea behind BP algorithm is quite simple, output of NN is evaluated against desired output. If results are not satisfactory, connection (weights) between layers are modified and process is repeated again and again until error is small enough. Simple BP example is demonstrated in this paper with NN architecture also covered. The algorithm will also be applied to an Intelligent Personal Assistant Development Platform that can be used by developers and enthusiasts alike to develop their own smart agents. the platform will provide users the core components of an IPA: Speech to Text, Intent Recognition and Text to Speech, and at the same time serve as a platform for integration of web services and as a conduit for devices in the ever-growing Internet of Things.