

# The Application of Multilayer Feed forward Neural Network in Internet of Things

<sup>[1]</sup> Er. Sameer Dixit, <sup>[2]</sup> Er. Kamalesh Chandra Maurya, <sup>[3]</sup> Er. Rahul Ranjan  
<sup>[1][2][3]</sup> (Asst. Professor), Integral University, Lucknow

**Abstract:** - Multilayer Neural Network algorithm is a typical artificial neural network learning algorithm, the main structure consists of an input layer, one or more hidden layer, an output layer, the layers of the number of neurons, the output of each node the value is decided by the input values, the role, function and threshold. The Internet of Things is based on the information carrier of the traditional telecommunications network, so that all can be individually addressable ordinary physical objects to achieve the interoperability network. The paper puts forward the application of Multilayer neural network in internet of things. The experiment shows Multilayer Neural Network algorithm is superior to RFID in internet of things.

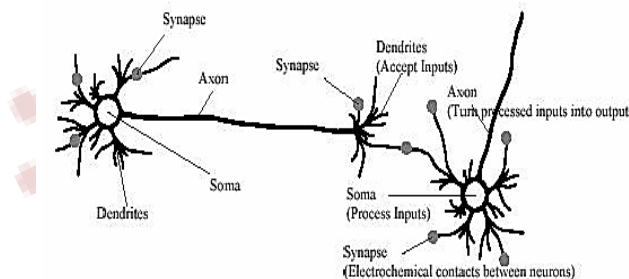
**Keywords:** ANN, internet of thing, RFID.

## I. INTRODUCTION

### Artificial Neural Network-

An ANN is efficient information processing system which resembles in characteristics with a biological neural network. The biological neuron consists of three main parts.

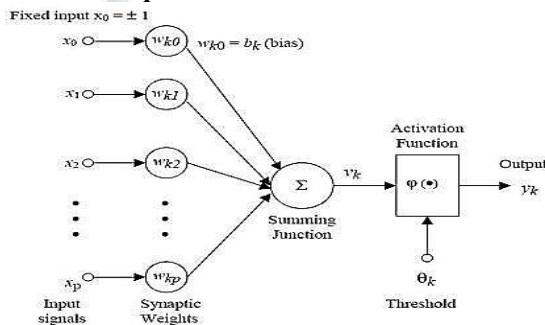
Soma or cell body – where the cell nucleus is located.



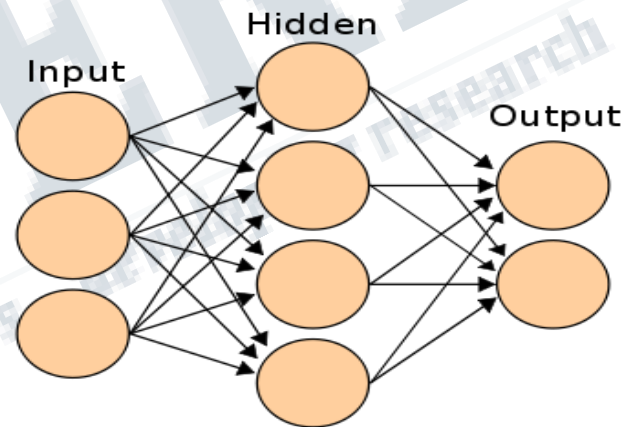
Dendrites – where the nerve is connected to the cell body

Axon – This carries the impulses of the neuron

### Mathematical Representation of ANN-



### MLP methodology



Internet of Things is the material objects connected to the Internet. This has two meanings: First, the core and foundation of the Internet of Things is still the Internet is an extension and expansion of Internet-based network; second, between the extension and expansion of its client to any goods and articles, information exchange and communication. Therefore, the definition of things through radio frequency identification (RFID), infrared sensors, global positioning systems, laser scanners, and other sensing devices, according to the agreed protocol, any items with the Internet connection, the exchange of information and communication items intelligent identify, locate, track, monitor and manage a network. The Internet of Things is based on the information carrier of the Internet, the traditional telecommunications network, so that all can be individually addressable ordinary physical objects to achieve the interoperability network. It has common object equipment, intelligent

## International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)

Vol 5, Issue 4, April 2018

autonomy terminal interconnection and universal service three important characteristics. The paper puts forward the application of BP neural network in internet of things.

### **Radio-frequency identification (RFID)**

Radio-frequency identification (RFID) is a technology to record the presence of an object using radio signals. It is used for inventory control or timing sporting events. RFID is not a replacement for the bar coding, but a complement for distant reading of codes. The technology is used for automatically identifying a person, a package or an item. To do this, it relies on RFID tags.

### **Most RFID tags contain at least two parts.**

One is an integrated circuit for storing and processing information, modulating and de-modulating a radio-frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. There are generally two types of RFID tags: active RFID tags, which contain a battery, and passive RFID tags, which have no battery.

### **The neural network of Internet of Things**

BP neural network is the product of artificial intelligence technology developed rapidly and is widely used in various engineering fields, because of its highly nonlinear common in dealing with nature and uncertainty, with a strong nonlinear mapping ability and unique the advantage of much great importance to researchers of various disciplines. So far, it has been widely used in nonlinear modeling, function approximation, pattern classification, etc., is the most widely used neural network model, works well, easy to learn. Structure and working methods of the artificial neural network according to the neurons in different connections, the neural network are divided into two categories: hierarchical network and interconnected networks layered network all the neurons in a neural network model in accordance with the functions into several layers. General input layer, hidden layer and output layer, each layer sequentially connected. It can also be subdivided into three kinds of interconnect: a simple feedback to the network, prior to before the network layer interconnected to the network. Mutual connection network is any network between the two units is up to, that is, there is a connection path. Interconnected network, it is another branch of the Ministry of interconnection and interconnection. Fully connected network the output of each neuron is connected with other neurons, and local interconnect network between some neural element is not connected relationship. The Internet of Things refers to the sensing devices through a variety of information, such as sensors, radio frequency identification (RFID) technology, global positioning systems, infrared sensors, laser scanners, gas sensors and other devices and techniques, real-time acquisition of any

need to monitor, combine to form a vast network of connections, interactive objects or processes, collecting their sound, light, heat, electricity, mechanics, chemistry, biology, location information of a variety of needs, and the Internet [2]. First, it is widely used for various sensing technology. Things intranet deployment the massive variety of types of sensors, each sensor is a source of information, different types of sensors to capture the information content and information in different formats. The sensor data obtained with real-time, periodic collection of environmental information at a certain frequency, continuous updating of data. Second, it is ubiquitous networks on the Internet. Collected from time to time in the Internet of Things sensor information transmitted over the network, because of its very large number, forming a mass of information, during transmission, must adapt to a variety of heterogeneous networks and protocols, in order to ensure data accuracy and timeliness of it. The Internet of Things is not only the connection of the sensor itself also has the ability of intelligent processing; intelligent control can be implemented on the object. The combination of sensors and intelligent processing of Things, the use of cloud computing, pattern recognition, and other smart technology, expand its application areas. Vast amounts of information from the sensor analysis, processing and handling of meaningful data to accommodate the different needs of different users discover new applications and application mode. In the hidden layer structure of the research network, compiled using Matlab neural network patch contrast single and double hidden layer structure repair results to determine the repair hidden layers BP neural network; research network training algorithm, the use of visualization the Visual Basic application development tools, the preparation of the application, the large number of experiments to determine the hidden layer nodes, and reasonable network training algorithm is designed to improve the training speed of the network. BP neural network with BP learning, the learning process is divided into four stages: an input mode by the input layer through the hidden layer to the output layer, layer by layer spread pattern along the propagation process. Network desired output the difference between the actual output, ie the error signal, is the correction implied by the output layer by layer to the input layer, layer by layer connection weights of the error back propagation "process." mode along the propagation process and the error back propagation process is repeated alternate network "memory training" process. Networks tend to converge, the global error of the network tend to the minimum, "Learning convergence process. BP network overview of the back-propagation network (Back-Propagation

**International Journal of Engineering Research in Computer Science and Engineering  
(IJERCSE)****Vol 5, Issue 4, April 2018**

---

Network, referred to as the BP network) is a nonlinear differentiable function of weights training multi-layer network. BP network is a multi-layer feed-forward neural network, the neuron transfer function is S-shaped function output for 0-1 continuous quantity, it can be any nonlinear from input to output mapping. Due to the adjustment of its weights using back-propagation learning algorithm (Back propagation), known as the BP network. Internet of Things is a dynamic global network infrastructure, it has a standards-based and interoperable communication protocols, self-organizing ability, in which physical and virtual "objects" of identity, physical attributes, virtual features, and intelligent interfaces, and seamless

**REFERENCES**

- [1] Changsheng Xiang, ZiYing Zhou, "A New Music Classification Method based on BP Neural Network", JDCTA, Vol. 5, No. 6, pp. 85 ~ 94, 2011.
- [2] Han Xiao, Yuanjiang Li, "A New Thought based on the Service Composition of Automatic Transmission Semantic Grid in Internet of Things", IJACT, Vol. 3, No. 7, pp. 10 ~ 16, 2011
- [3] Ren Fang, Ma Jian-Feng, "Attribute-Based Access Control Mechanism for Perceptive Layer of the Internet of Things", JDCTA, Vol. 5, No. 10, pp. 396 ~ 403, 2011.
- [4] Li xinwu, "A New Color Correction Model for based on BP Neural Network", AISS, Vol. 3, No. 5, pp. 72 ~ 78, 2011.