

THE ADAPTATION OF NEURAL NETWORK TO A HEALTH INFORMATICAL SYSTEM

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Abstract: The mathematical structures of neural network is about a new hierarchical system. The neural network gives the main parts of the developing of mathematics searching nowadays. The objective of this research is to find a suitable contact between this systems and the health informatical systems [1, 2].

Keywords: Health, informatics, tools, neuron, network

INTRODUCTION

We can realize the health informatical systems understandable than neural networks' series. Because of a neural net and the Health Informatical system can be a hierarchical model and that is why we connect them to each other. The comparison is imaginable, because of the fundamental unit the neuron inside of the neural network and the fundamental unit a information system is a health data unit. The subordinate units of the health data unit are full with the independent intelligence. All of members of the neural nets are intelligent, self-adjusting, self-organizing and capable to co-operate and this is the proveness of that we bring them connect with each other [1, 2].

In result of the the biological researches that natural biological neural networks' sample can be created calculating systems. These neural systems building similar with the biological neural systems much elemental one being in a connection with each other operations making they consist of a unit, which ones complicated tasks may be capable of a most fast solution through their parallel function.

About the neural networks: [1, 2]

- Those kind of hardware or software which is capable to work in paralel, divided mode;
- It is a connected system of the similar operating elements (neuron);
- Learning algorithm;
- Recall algorithm.

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THE CONSTRUCTION OF THE NEURONS

The neural operation element or the processing element is a device with one or more output with non-linear mapping. We call it the activation function, because they are activating the non-linear functions. Accesses carrying changing values are at disposal of the neurons accesses carrying a constant value are at their disposal concerned so for example in the 1. equation it. We may grant the function of the neuron in the undermentioned form: [1, 2]

$$y(k) = f(x(k), x(k-1), \dots, x(k-M), y(k-1), \dots, y(k-L)) \quad (1)$$

1. where $x(k) = [x_0(k), x_1(k), \dots, x_N(k)]^T$. The N variable – one single constant access single $N + 1$ elements x into a vector that we rounded it up. In this case the neuron single $f: \mathbb{R} \rightarrow \mathbb{R}$ accomplishes mapping.
2. A neuron can have inputs with variable values and also have inputs with constant values.

Neuron without memory

$$S = \sum_{i=0}^N w_i x_i = w^T x$$

$$y = s = W^T x$$

In the summary point we get the linear combination of inputs.

The markings of the equations:

- ✓ X : Skalar input
- ✓ W : $I = 0, 1, \dots, N$: weights
- ✓ $F(\cdot)$: Non-Linear element

THE NEURAL NETWORK'S TOPOLOGY:

1. Access neurons: Other neurons are used for his drive.
2. Output neurons: Sends on the information towards the environment.
3. Hidden neurons: The access and the output are attached to other neurons exclusively [1, 2].

ADAPTATION OF NEURAL NETWORK TO HEALTH INFORMATION SYSTEM

The main objective of this article is to create a new model to mix the mathematics, informatics and the Health systems. The point of this chapter is visionable on the *Figure 1*. There is a big mathematical equation background of the neural networks.

We presents only the main features. All of the parts are intelligent part, supplied with PC, and other tools. The aim of this care model. There is a patient in the social security system. He has something kind of illness. He has security. He has got smart tools from the security firm. This tool is communicate with the General Practitioner, in 24 hour. When it has a sign to the doctor, the doctor has to make the decision, what to do with his patient. He can take him to the suitable institutes, where he can got any kind of help. In the University between the hospital and the Rehabilitation Centre there are so many feedbacks, because of the directions way of communication . Finally it could be realizable that the patient can be rehabilitated at home, controlled and supervised by a specialist team.

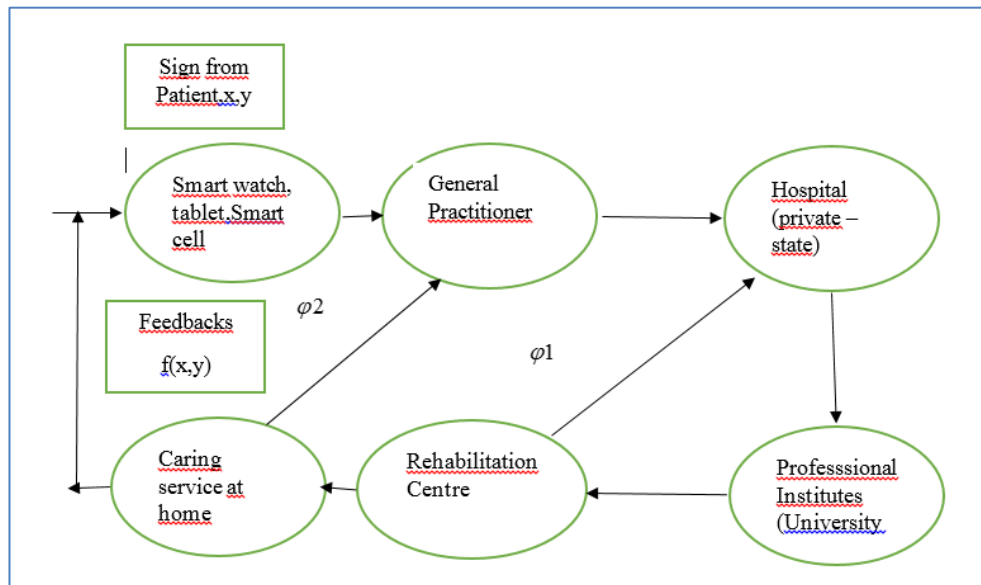


Figure 1: The Neural Network model at Health Informatics

CONCLUSIONS

The main objective of this article was to find connection of neural networks between the Health Informatical systems. Our opinion is there are so many connection between 2 system. That is a possibility how meet the mathematics and the informatics at the case of healthcares.

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