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KNOWLEDGE BASE INCORPORATED WITH NEURAL NETWORKS

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ABSTRACT

Subsymbolic Knowledge processing is said to be change states of networks constructed from small elements. Subsymbolic systems also make it possible to use connectionist models for knowledge processing. Connectionist realization such modules are modules linked together for solving a given problem. We study using neural networks as distinct actions. The output vectors produced by the neural networks are consider as a new facts. These new facts are then processed to activate another networks or used in the current production rule. The production rule is applying knowledge stored in the knowledge base to make inference. After neural networks knowledge base is constructed and trained. We present a running sample of incorporating neural network knowledge base. We implement using rochester connectionist simulator. We suggest that incorporating neural network knowledge base. Therefore incorporated neural network knowledge base ensures a cleaner solution which results in better performance.

1. Introduction.

The symbolic paradigm is based on the theory of physical symbolic systems (newel&s1non, 1972) in general a symbolic systems consists of two main features. The first is a set of elements, these may be thought of as objects. The second is a set of processor. The set of elements is used to construct more complicated elements and structure. The set of processors and rules are applied to the set of elements.

The other subsymbolic paradigm (Samalenski, 1990) claims that, intelligent behaviour is performed at a subsysmbolic level ,which is higher than the neuron level in the brain but, different from the symbolic one.

Subsymbolic systems also make it possible to use connectionist models for knowledge processing. Thus the processing of symbolic system may be accomplished by developing subsymbolic systems.

- connectionist expert systems
- connectionist production systems
- connectionist modular systems.

Connectionist systems are classified as either hierarchical or modular. Which makes them suitable for model the human brain. The flexibility of intelligence in the brain comes from the enormous number of different information processing rules, modules and the level of operation. Hierarchical model is biological and psychologically plausible.

Connectionist realisation of such modules are modular systems consisting of several modules linked together for solving a given problem. A modular system may be represented as a collection of similar subtasks, each being solved in one submodule of the whole system. So , each module solves a different part of the whole problem. This is known as a connectionist modular system. Different modules may provide alternative solutions. The last one is the best of them or a combination of them. This is known as the hierarchical solution to a problem, otherwise known as a connectionist hierarchical system. Different modules require different connection methods to other modules. However, all modules must have one main module which has the upper control. Fuzzy systems, symbolic systems, genetic algorithms, decision making are known to be the element of a hybrid systems.

3. Neural Network in Production Rules.

The main idea of incorporating neural networks into production rules is to activate the network as distinct actions. Here facts from the working memory are passed as input vectors to the neural networks. The output vectors, produced by the neural network are considered as new facts. These new facts are then processed to activate another network or used in the current production rule.

manner inspired by fuzzy logic other classical expert systems use different modules. Prospector made use of network models and connectionist models.

The production rule is a mechanism which applied knowledge stored in the knowledge base make an inference. After a neural network knowledge base constructed and trained ,it can be used by production rule. As usual, the production rule is a general one ,its can be used for different knowledge base. When used with a medical diagnosis knowledge base, it became a diagnosis expert system; in this case ,it is a knowledge base evaluate.

Production rule here uses the neural network to perform the following tasks

- Inference based on partial information,
- request of unknown input facts that are important for the decision.
- production rule reducing justifications for conclusion.

We consider Fig–2 as trained data in the neural networks.

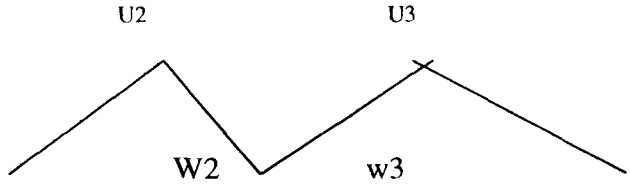

Fig.2 Backpropagation in the neural network.

Ui give positive support for u2 and

Negative support for u3

Because w2>0 and w3<0

There are two kinds of questions why, how they request for explanation. In one case, how is the conclusion about the activation of some node u1 reached? The answer obtained using by production rule.

If the user asks that how the output concluded, the answer given by the production rule. Which is in terms of hidden units would be of little meaning to the user. What the user wants might be something like this