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**Overview:**

Artificial neural networks also called neural networks; it is a series of algorithms that recognize underlying relationships that mimic the operation of the human brain to identify relationships between vast amounts of data. It can adapt to changing the input of data, so it generates the best possible result without changing the output instructions. A neural network works similarly to the human brain’s neural network. A ‘neuron’ in a neural network is a mathematical function that performs particular action based on the given instructions. It consists of a layer of interconnected nodes. Each node is called a perceptron. In a multi-layered perceptron (MLP), they are arranged in interconnected layers. Generally, the input layer collects input. The output layer maps the information. Neural networks are a computing system with interconnected nodes that work more likely human brain. So we can use it to recognize correlations and hidden patterns in raw data and also to cluster and classify raw data, which continuously learns and improve over time.

Finally, I found one academic paper that outlines the problem statement and solved it by using neural networks.

**Problem Statement**

**“Application of the artificial neural networks in estimating participation in elections.”**

They used neural networks to estimate participation in elections. I am very interested in this project because I wanted to learn how they used neural networks to solve this problem. According to their academic paper, they were trying to estimate participation in the presidential election of Iran implementing artificial intelligence techniques.

**Used Neural Networks**

According to the academic paper, they have used multilayer feed-forward artificial neural networks. It is a kind of neural network in which learning of a neural network is performed by the back-propagation algorithm. It frequently repeats the weight learning process to classify. Basically, it consists of an input layer, one or more hidden layers, and an output layer. These input layers are responsible for transferring input. Once it weights input, it transfers to the second layer of pseudo-neuron units, which is called the hidden layer. The output of this hidden layer enters another hidden layer as an input; then, the weighted input reaches ideal weight, networks learn by educational data series, and provides classification and anticipation operation for tuple and test samples.

**Why Useful?**

These neural networks are beneficial to estimate the participation of voters for the election. It might give some insights about election prediction and election-related activities that help to manage the resources and complete the election process.

**Time Duration and Complexity:**

Actually, they created an artificial neural network using Matlab tools and chose Feed-network with tan-sigmoid transmission function in the hidden and output layers. They also used ten (10) neurons in hidden layers. They had ten (10) inputs, and three (3) outputs for this process. As a data preparation, they split data into different stages, such as 70% for training purposes, 15% for validation purposes, and 15% for testing purposes. I think they had very simple data as personal data of 100 individuals, but they did not mention the time duration of the project.

**Result**

**A**ccording to their conclusion, they got 91% accuracy in the future election of the Islamic Republic of Iran in Kohkiloyc and Boyerahmad province. They tried once to estimate the participation in the presidential election of Iran. They never mentioned other attempts to solve this problem.

**My Questions to Auther**

I enjoyed reading their implementation of neural networks as well as their academic paper, but they did not mention time duration. I was kind of curious about the time duration, faced problems and issues while working in that project. So I would like to ask the following questions.

1. Why do they choose multilayer feed-forward neural networks?
2. What was the time duration and cost of the project?
3. Why they used only 100 samples?

**References:**

Seyyed R K, Mohammad M & Sohrab H **(**2013**),** Application of the artificial neural networks in estimating participation in elections,<<https://arxiv.org/ftp/arxiv/papers/1309/1309.2183.pdf>>