Research On Supply Chain Based on Medical Informatics and E-Commerce System: Computer Engineering and Algorithm to Prevent Disease

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Abstract. Based on the impact of Chernobyl nuclear accident and the situation of transmissible viral pneumonia in eastern Europe, the research team proposed an algorithm model for nuclear radiation data collection and disease occurrence prediction with artificial neural network as the core, and proposed a computer model for drug trade in traditional Chinese medicine against transmissible viral pneumonia, which solved the problem of virus monitoring and nuclear radiation detection. Through the construction of network supply chain, An international rescue network model was proposed for nuclear radiation and transmissible viral pneumonia, which solved the problem of shortage of doctors in the Republic of Belarus and realized medical mutual assistance between China and Belarus. The research team trained a neural network using the recovered questionnaire. This neural network has the ability to predict the willingness of people in a certain region to buy anti-tumor drugs. We take this algorithm as part of supply chain optimization.The research team discussed the above model and reported it based on the experimental results.

Keywords: artificial intelligence, technology, computer model, education information system, genetics, archives management, computer system. English teaching.

1. Introduction

Nuclear radiation has led to an increase in the incidence of diseases in Eastern Europe. Traditional Chinese medicine can intervene in the prevention of these diseases. The working mechanism of nuclear radiation sensors is an important content at present. When integrated into unit data collection, artificial neural networks can be used to predict diseases. The demand for medical products can be predicted through diseases, using bioinformatics as medical evidence to prove the working principle of export products after curative effect, and according to this idea, build the economic system and mathematical modeling under computer engineering, with the purpose of constructing a computer integrated model of physics medicine mathematics product management, and serving the people of Eastern Europe [1-6].

2. Model design

In Figure 1 and figure 5, the research team shows several innovative points of our e-commerce system after interdisciplinary integration.
After the introduction of the model, the results of the neural network will be displayed,

As shown in Figure 1, As shown in Figure 1, the research team used the Internet of Things to model the nuclear radiation sensor in computer engineering. The current working mechanism of the sensor is different from the pulse working mechanism, which is shown in the figure. At the same time, the network information path is analyzed. Multiple physical sensors can directly analyze the data sensing. This network model is submitted to the multivariate data acquisition center shown in Figure 2 through the information processing center, The neural network is used to recognize the sensor data and features. I have heard of this method to predict the disease incidence in this area.The information path can be a 6G network path. The information processing center is the data collection center of the sensor after the target area is divided. In Figure 2, these sub information centers will submit the data to the central processing center.

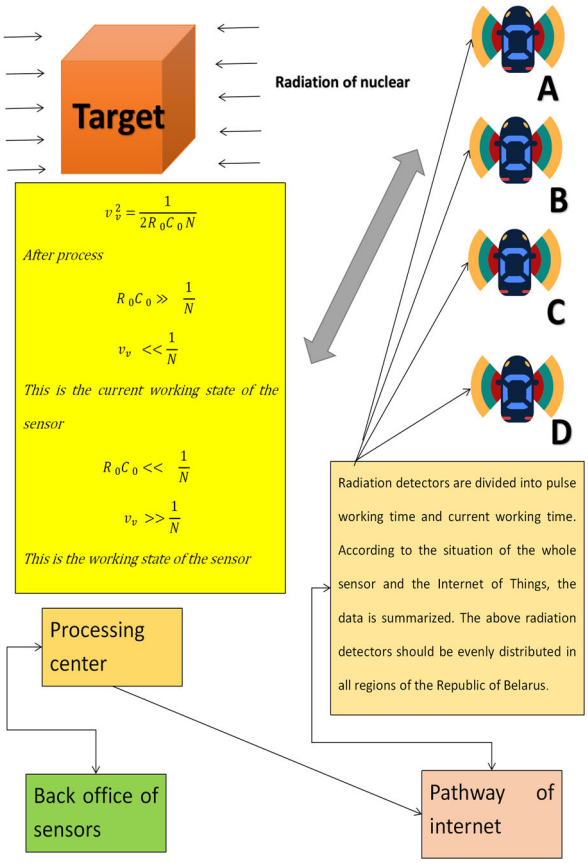

Fig. 1 Physics based working principle of nuclear radiation detector and control model of Internet of Things

As shown in Figure 2, As shown in Figure 2, on the overall multivariate data summary, we have shown our computer engineering strategy for prediction through nuclear radiation. During the research in Belarus, the research team found that the Zapolo Thermal Nuclear Power Station and Chernobyl Nuclear Power Station are geographically very close to the Republic of Belarus, so it is necessary to carry out nuclear radiation protection and prediction models in this region. These multiple data acquisition system can predict the distribution of sensors in various regions, such as Minsk, St. Petersburg, etc. The central processor collects these data, directly displays and formulates policies on the one hand, and conducts the final neural network calculation according to the prediction rate of the neural network of these distributed calculations, and carries out feature recognition for multiple distribution regions, Get the overall incidence rate of the whole country in a certain period of

time.According to the overall incidence rate and the total population of the country, we can calculate the number of disease cases in a certain period of time, and analyze the number of disease cases. Because the role of nuclear radiation in the post Chernobyl period is mainly chronic, this figure can be provided to China, which is very advantageous in traditional medicine intervention in chronic diseases.

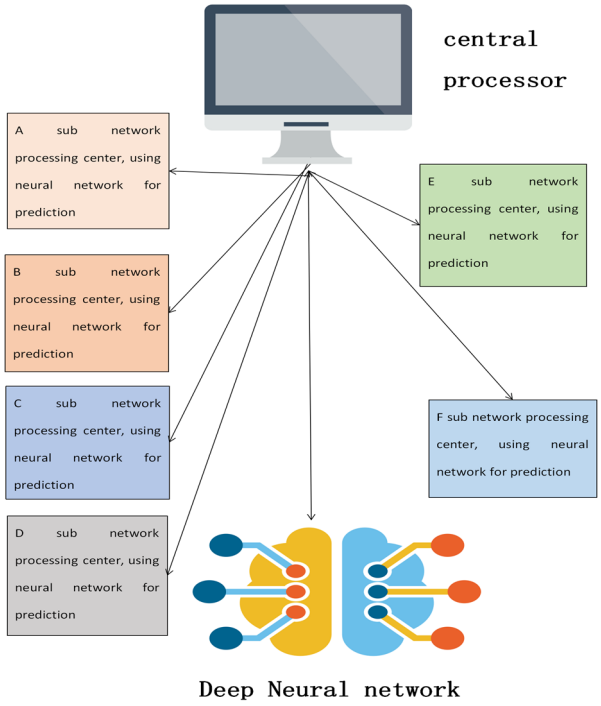

Fig. 2 Multi data acquisition and analysis system model based on artificial neural network.

As shown in Figure 3, As shown in Figure 3, the research team showed the flow chart of this method. After the fusion and processing of multiple data, different strategies were presented according to different diseases. This core mechanism is to classify diseases. At present, according to the epidemiological report, there will be a viral respiratory disease in 10-12 years. At the same time, the onset of respiratory disease is seasonal. We have integrated respiratory virus diseases into the supply chain.In short, in Figure 4, the research team believes that in bioinformatics, network pharmacology can be used to construct a network of intervention target action mechanisms. The core of this network is to use Markov neural network to prove the biological information pathway of traditional Chinese medicine.

As shown in Figure 4 and Figure 5, Using mathematics to predict the relationship between supply and demand is also an important part of computer engineering.As shown in Figure 5, in the process of computer economic analysis, the application of economic mathematics is a very common phenomenon, mainly including functions, derivatives, fractional equations and other related economic mathematical theories. In the process of practical research and analysis, making full use of these related theories can better solve the complicated economic relations with the method of mathematical formulas, so as to better solve the problems in economic analysis. The problem of demand degree of supply and demand relationship can be solved by using computer for intuitive analysis and display, and these problems can be directly solved by putting the above functions into the computer system.

As shown in Figure 1 to Figure 5, using the core of our overall model of engineering science to solve problem 4, we constructed the physical sensor data collection - neural network incidence rate prediction - incidence prediction of grouped diseases - evidence-based medicine model of traditional Chinese medicine supported by neural network - mathematical support strategy model based on computer trade system, which solved the application problems of virology, bioinformatics and physical sensors in preventive medicine.

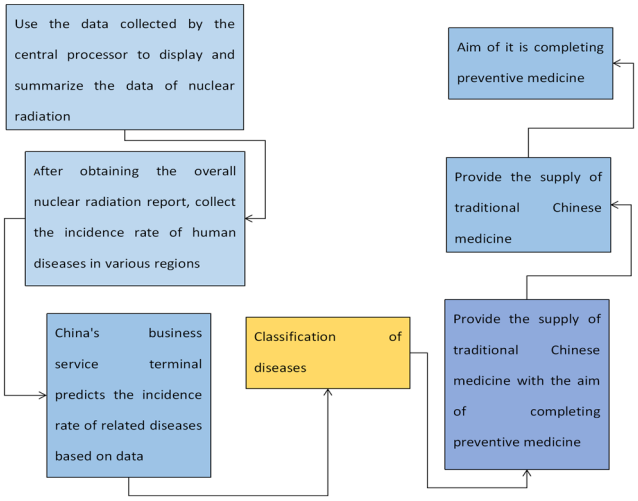

Fig. 3 Information Supply Model of Computer Commerce and Trade System Based on Bioinformation Technology

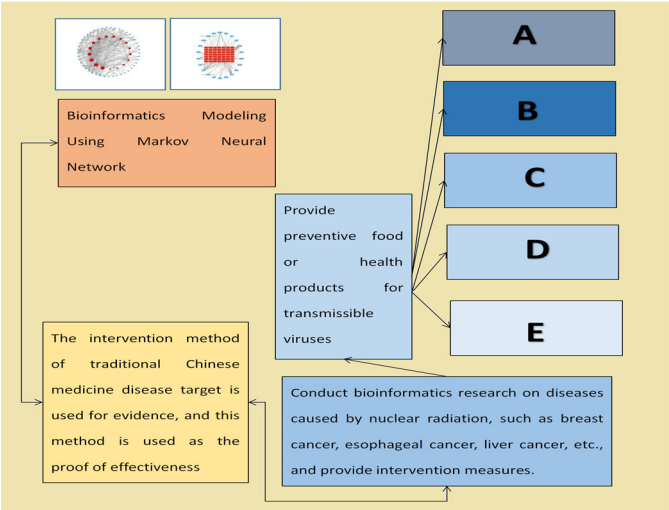

Fig. 4 A model for predicting disease occurrence using susceptible gene.

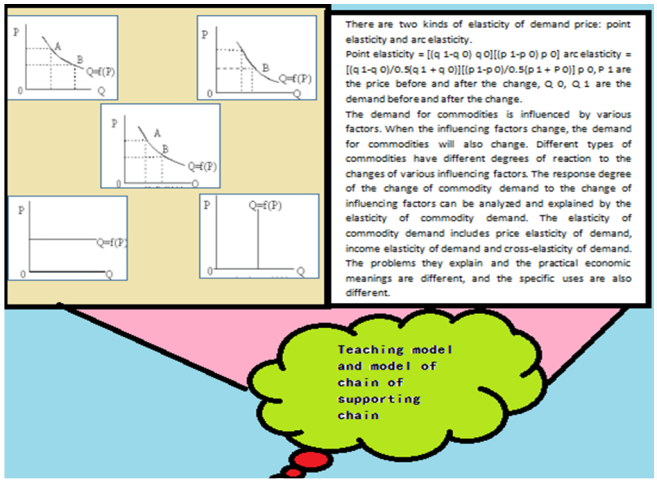

Fig. 5 A necessary model of math to build up supporting chain by computer technology.

To sum up, Figures 1 to 5 are an overall model. From the data of nuclear radiation obtained by physical sensors to the prediction of disease occurrence to the data of bioinformatics, these data become the theoretical support for intervention measures and the economic mathematical calculation in the process of trade. This model can be used not only for the Zazaboro nuclear power plant in Ukraine, but also for nuclear power plants in other regions. The damage to human body caused by

nuclear radiation is huge, It is feasible to minimize human losses by using this overall computer engineering, with tactile sensor technology, traditional Chinese medicine technology, network pharmacology, and in-depth learning as the core.

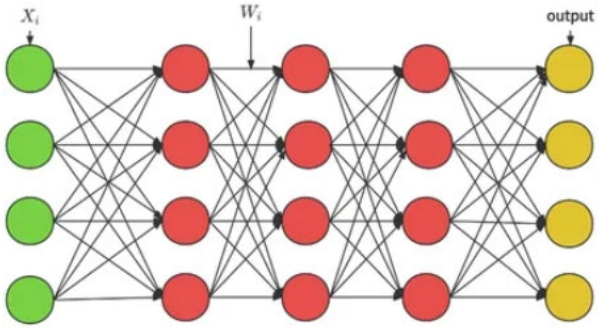

Fig. 6 A Deep neural network model in ideal state

We show the full connection layer of our neural network, and we consider using the relu activation function for activation. The five hidden layers predict by identifying four questions in the questionnaire. The main features of the four hidden layers are the patient's age, gender, location (used here to mark the amount of radiation, which needs to be obtained from the model in Figure 1-3), and the status of the disease, including the early pathological symptoms of infectious diseases (new coronavirus) and four kinds of cancer (breast cancer, esophageal cancer, gastric cancer, colorectal cancer and liver cancer). The data should be trained after cleaning.These four characteristics are used to predict the health care consciousness of any population. We all adopt the method of questionnaire survey. Among them, the survey on health care consciousness is divided into five types: a-e.

But at present, because the sensor model is only a primary concept, we can only simulate the radiation value of the Eastern European people's living area from the published database.

We consider using tanh, relu and sigmoid functions. We believe that during the training process, changing the optimizer and optimizing the activation function can form a control group, which is also one of the methods to improve accuracy.

As shown in the figure, the expression of sigmoid activation function.

$$\mathrm{F(x)} = \frac{1}{1+\mathrm{e}^{-\mathrm{x}}} \tag{1}$$

As shown in the figure, the expression of Tanh activation function.

$$\mathrm{F(x)} = \mathrm{Tanh(x)} = 2/1 + \mathrm{e}^{-\mathrm{x}} - 1 \tag{2}$$

As shown in the figure, the expression of Relu activation function.

$$\sigma(x) = \begin{cases} max(0,x) & ,x >= 0 \\ 0 & ,x < 0 \end{cases} \tag{3}$$

Relu function is a popular activation function in deep learning. Compared with sigmoid function and tanh function, it has the following advantages. When the input is positive, there is no gradient saturation problem. The calculation is much faster. There is only a linear relationship in the relu function, so its calculation speed is faster than sigmoid and tanh. However, we believe that the optimization of neural network should also be carried out in detail in order to improve the efficiency of neural network.

3. Experiment

Objective: To understand the current situation of neuroscience teaching in China and Belarus, and to understand whether there are relevant teaching models and students' level. Participants: Master and undergraduate students of the Sakharov International National Ecological Research Institute of the Republic of Belarus, clinical medical expert students of the Belarusian National Medical University, Chinese students of Moscow University, students of the Ninth Clinical Medical School of Peking

University, China, nuclear radiation, gene mutation, preventive medicine, sensors, neural networks, the Internet of Things, medical engineering, mathematical modeling, supply chain, and bioinformatics. A is very clear B is very clear C is not very clear D knows something. Number of participants: 100 Test method: questionnaire survey; The results are as follows. (Note: Due to the different ecological conditions in different regions, as well as the investigation and resistance in the border area between Ukraine and Belarus, the research team could not directly contact the population in Kiev, so social experiments were conducted in Belarus.)

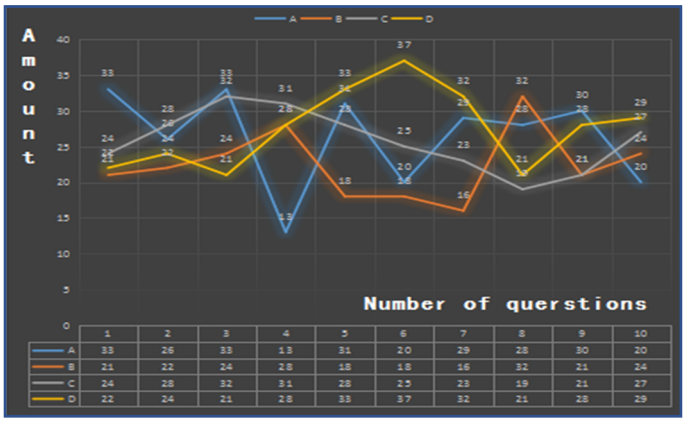

Fig. 7 Data-analysis

Data analysis: As shown in the figure, during the whole experiment, we think that Russian students are very interested in mathematics at present. This modeling has certain feasibility and demand degree in promotion.

We make a neural network to predict.

Iteration times (epoch): 200, batch size (0 means no batch): 4, learning rate: 0.01.

Percentage of test set (%):80, percentage of validation set (%):20, loss function: meansquareerror, optimizer: Adam.

Number of training sets: 1, number of verification sets: 8, number of test sets: 32

We selected 42 questionnaires and trained the neural network in Figure 6. In this process, we tried to analyze certain rules, because the current research team can collect more data to improve the accuracy in the future. Of course, the low accuracy of the current model may be due to the insufficient amount of data.The data of these 42 questionnaires can be obtained from the corresponding author of this article, and the data are filled out offline in a face-to-face manner

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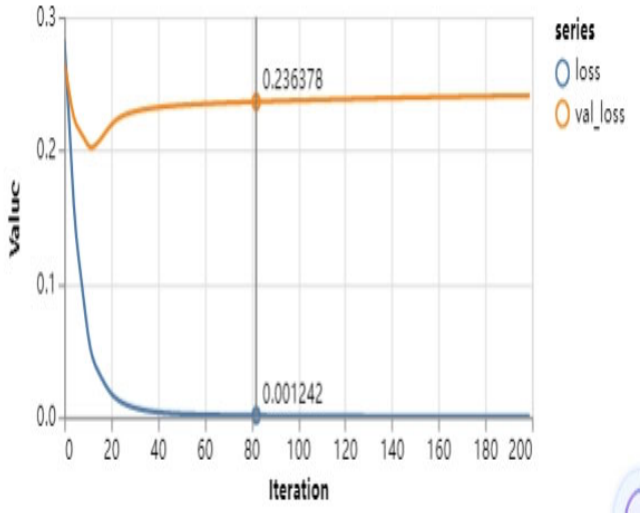

Fig. 8 Data-analysis (Loss Model)

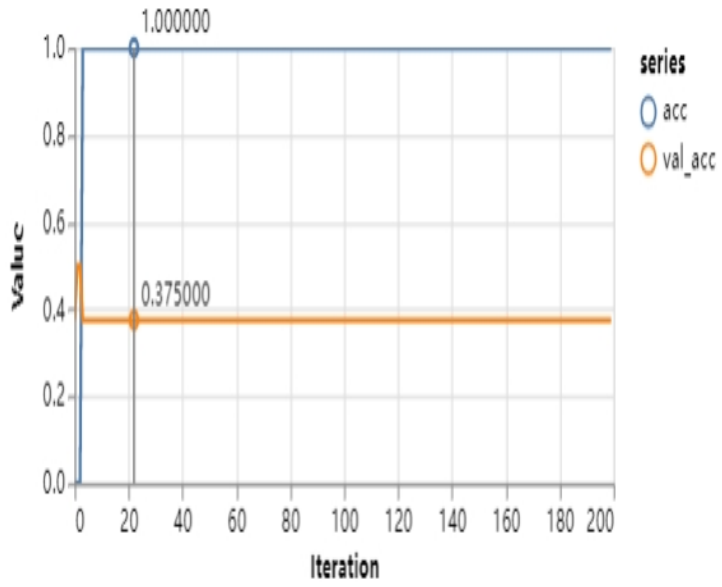

Fig. 9 Data-analysis (Model accuracy)

ACC is the accuracy of the training set, Val_ ACC is the accuracy of the validation set.

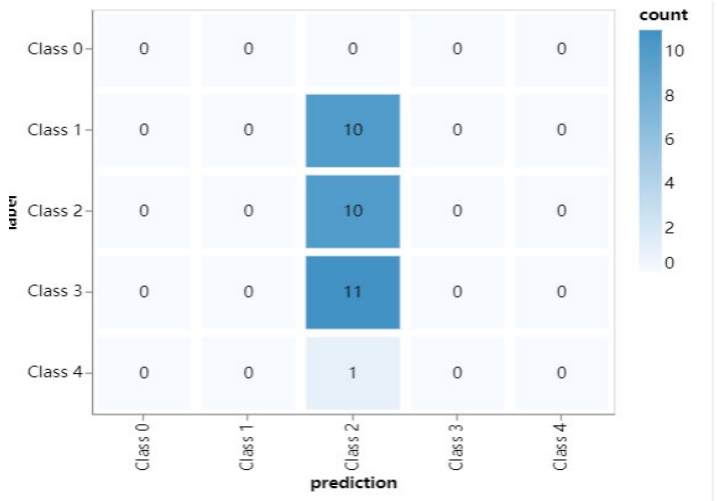

Fig. 10 Data-analysis (confusion matrix)

4. Discussion

We believe that there is a possibility of increasing nuclear radiation in Eastern Europe. The research team has put forward an idea of emergency discussion, which can complete the design of this platform in Eastern Europe, and support Belos in China. The supported hospitals are shown in the figure. These hospitals have the highest number of medical talents in China.

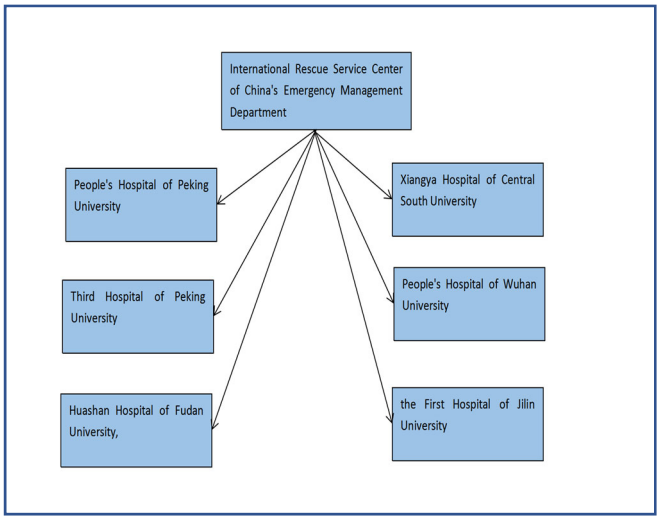

Fig 11. Mechanism selection chart based on international services.

Buying medical services in international trade is also a new measure proposed by us. It is reported that the international emergency medical team led by West China Hospital of Sichuan University has officially passed the World Health Organization expert certification, becoming the world's first highest level nonmilitary international emergency medical team and China's first medical team.

The research team believes that the above hospitals have the ability to establish this international medical team and can quickly travel to the affected areas through network communication. According to this situation, the research team made a strategic statement. The current international rescue teams need to carry out emergency care, trauma surgery, orthopedic diagnosis and treatment, general anesthesia, emergency surgery, acute and severe treatment of infectious diseases, obstetric emergency treatment, pediatric trauma and conventional pediatric disease treatment. At the same time, it can also carry out medical projects such as laboratory testing, basic X-ray and ultrasound. For current medical institutions, the research team believes that it is necessary to rapidly promote international rescue business in China. Especially to prevent huge natural disasters. Reserve necessary medical resources, whether in their own countries or other countries, can save human lives as quickly as possible.

5. Conclusion

The model designed by the research team can deal with many difficulties in medical mathematics. Therefore, the research team believes that it is necessary and feasible for institutions in Eastern Europe to achieve this goal. At the same time, the integration of applied mathematics and computer is more conducive to international communication in physical medicine.

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