

# From the Perspective of Economic Research under the Disaster State Caused by Nuclear Radiation: Mathematical Computer Mathematical Modeling Based on Cognitive Neuroscience and Neural Network Model

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**Abstract:** The research team simulated the nuclear radiation disaster in Inner Mongolia, China, and modeled it through computational neuroscience and emotional cognition. The core of this model is psychological assessment and data planning based on cognitive neuroscience, and then proposed the overall neural network construction through mathematical modeling. The research team discussed and demonstrated the model design in detail, and proposed this concept for the first time in the world.

**Keywords:** Natural Disaster; Economics Management; Science Neuroscience; Mathematical Modeling

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## 1. Research background:

Nuclear radiation, or radioactivity as it is often called, exists in all substances. This is an objective fact and a normal phenomenon that has existed for hundreds of millions of years. Nuclear radiation is the microscopic particle flow released by the atomic nucleus in the process of changing from one structure or energy state to another. Mathematical modeling is to establish a mathematical model according to the actual problem, solve the mathematical model, and then solve the actual problem according to the results. We try to put forward an economic psychology model under the mechanism of huge natural disasters. The purpose is to solve the behavioral neuropsychological mechanism under huge natural disasters after the leakage of nuclear radiation, and to model the artificial neural network and try to propose an optimal disaster treatment process and mechanism.<sup>[1][2][3][4]</sup>

## 2. Model design

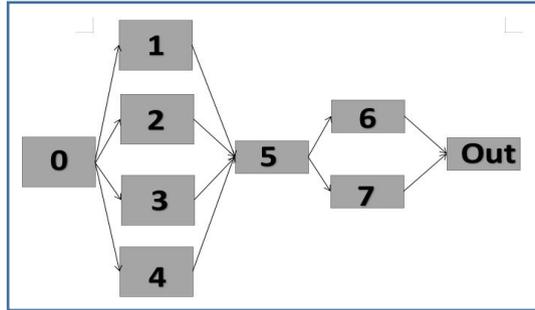


Figure 1 A model based on artificial neural network

The research team has put forward the first mathematical modeling strategy. The basic method is that we need to obtain the behavior mechanism of people with different personalities and economic status in a region through calculation. This method is derived from the bionic engineering in neuroscience. In the process of bionics, we conduct in-depth learning based on the existing data of nuclear radiation leakage in Ukraine, and obtain the algorithm through the existing data, The purpose of this algorithm is to find the optimal solution with life satisfaction feedback as the highest score. Before explaining the model in Figure 1, we describe the overall workflow in Figure 2.

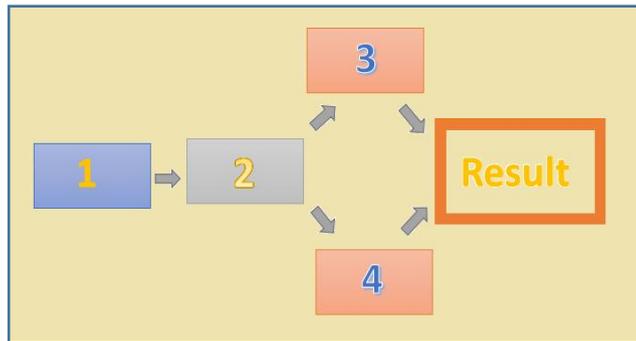


Figure 2 A model of working mechanism of count and math science

As shown in Figure 2, 1: start the prediction, 2: enter the neural network with data, 3: predict the result A 4: Forecast result B, obtain guidance report. In the overall workflow, 2 is an established artificial neural network, so necessary reports can be obtained after calculation.

In Figure 2, we have designed an artificial neural network. The specific structure of the neural network is shown in Figure 1. 0 is the data input terminal. The data is transferred to the human neural network after data cleaning and data integration. The first hidden computing functional layer is 1-4 bits. In the hidden computing functional layer, four codes, 00, 01, 10, 11, can be marked to distinguish the 1-4 types of personality in medical psychology. The four types of personality include extroverted, introverted, manic and stable. After the calculation of the four personalities, we calculate the total amount of the person's property. We try to design the data gradient of the program in 5 in Figure 1. The current research team believes that there can be 5 independent neurons in 5. The calculation function of neurons is that the calculation is divided into 0-1000010001-2000020001-30000, and the calculation method is designed based

on the function of the five calculation neurons. 6: Immigration, 7: No immigration, and then you can return the data from the input port, which is the score of life satisfaction. Of course, when we put forward this concept, there are differences in terms of the psychological characteristics of cognitive neuroscience of different nationalities. The research team will conduct data statistics, summarize laws and make use of the overall cognitive characteristics of different nationalities in the future.

Disasters have the law of regional combination, which not only affects the development of regional economy, but also belongs to the organic component of regional economic and social development. Our computational model is based on cognitive neuroscience. It shows that the psychological model can better reflect the effectiveness of economic psychology in terms of satisfaction calculation simulation and big data. In addition, the research team also considered using the matrix model to estimate the comprehensive impact of economic psychological changes after disasters on production, families, governments, enterprises and other aspects of the economy of each region. In fact, the matrix model has also been integrated into this study.

The artificial neural network can be used to predict the migration of local people and changes in the model of cognitive science after the disaster in this area. The research team believes that people's economic reserves can also influence people's cognitive emotional neuroscience in huge natural disasters, but its mechanism is still uncertain. Therefore, more research is needed in the future. At the same time, the artificial neural network and mathematical modeling currently designed by us can get the relevant big data prediction, which is also of some value and can carry out early intervention in policy regulation.

### **3. Outlook**

Disasters will stimulate consumption and GDP creation, such as World War II and post earthquake reconstruction. In fact, from the perspective of consumption alone, disasters only accelerate the inefficient consumption, that is, they accelerate the consumption of materials that should not have been consumed. This is a waste of natural resources and labor, and cannot be called effective creation of incremental GDP. Therefore, the GDP generated by disaster response and post disaster reconstruction is not happy, because it is of low value from the perspective of human development. However, in the process of dealing with disasters and solving problems, people often burst out with much greater creativity and innovation than usual, which will bring about a significant increase in growth rate and management system perfection, which can really inject new engines into future economic development (such examples are endless). The epidemic period will severely hit the retail consumer industry, but it will help the infection prevention system, medical emergency system (not to mention that a large number of provinces have already built local "Xiaotangshan"), vaccine industry, medical research and development and related industries to develop rapidly, and the relevant experience and talents will also be retained. At the same time, it will also stimulate further exploration of business models such as online education, online office work, and unmanned delivery.

### **4. Conclusion**

The research team has put forward a total of artificial neural network models and mathematical modeling. This mathematical model can solve the problem of predicting the changes in the cognitive

emotional neuroscience of the population after the catastrophe, and can provide some theoretical support in macroeconomic regulation and provide relevant data support. As an interdisciplinary, this research has certain value, At the same time, the research team will put forward more concepts and research in the direction of mathematical matrix, which can be integrated with this achievement and complete more detailed model design.

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