The Influence of 5g on the Development of Electronic Information Engineering

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Abstract. With the rapid development of the times, our quality of life is also rising rapidly. At present, our technology has undergone a round of rapid development and achieved certain results. The era of artificial intelligence based on computer technology has come, and our life begins to embrace and contain this new technology, so modern life is the era of artificial intelligence. So, the new technology has brought many changes. For example, in Information Engineering, we can replace manual operation with preset programming to increase efficiency and reduce error rate. So, how to program is a difficult problem. Therefore, this paper studies the influence of 5g on the development of electronic information engineering. In order to better carry out the experiment, we first set the general direction and overall tone of the experiment we need to do after consulting a large number of literatures. Then we borrowed a period of time from the laboratory to conduct real experiments. But before that, we also carried out simulation experiments to reduce errors, and then conducted real experiments (in this case, we used interactive system to model and calculate the number) According to the rationality, the experimental results are obtained. The experimental results show that after the improvement of artificial intelligence, 5g can increase the reliability of NC programming and the simulation of machining process.

Keywords: Artificial Intelligence; Modeling; Electronic Information Engineering; Integrated Algorithm

1. Introduction

"Efficiency is life", which was once said by people of that era. Now, it is reasonable to think about it. With the discovery and presentation of various new technologies, the role of artificial intelligence is becoming more and more important. At the same time, enterprises and factories are also pursuing efficiency more and more. At the same time, they should ensure the correct rate to ensure the maximum interest rate. Therefore, our research has important practical value, which is the importance of our research.

The main purpose of computer science is to simulate the human brain and make it possible to study, plan and simulate the human brain. Artificial intelligence will involve computer science,
psychology, philosophy and linguistics [1]. The relationship between artificial intelligence and artificial intelligence is far beyond the scope of artificial intelligence and applied science. From the perspective of thinking, artificial intelligence is not limited to logical thinking [2]. Only by thinking through images and inspiration can we promote the breakthrough development of artificial intelligence [3]. Mathematics is usually regarded as the basic science of many subjects. Mathematics has also entered the field of language and thinking [4]. The subject of AI must also borrow mathematical tools. Mathematics not only plays a role in the scope of standard logic and fuzzy mathematics, but also enters the artificial intelligence discipline. They will promote each other and develop faster [5].

5G network is developing in the direction of network diversification, broadband, integration and intelligence. With the popularity of various intelligent terminals, mobile data traffic will show explosive growth in 2020 and beyond [6]. In the future 5g network, reducing the cell radius and increasing the number of low-power nodes is one of the core technologies to ensure that the future 5g network supports a traffic growth of 1000 times. Therefore, the ultra-high-density heterogeneous network becomes the key technology to improve the 5g network data traffic in the future. In the future, wireless networks will deploy more than ten times more wireless nodes than existing sites [7]. Within the coverage of macro stations, the distance between stations will be kept within 10m, and 25000 users per 1km2 will be supported. At the same time, the ratio of active users to the number of stations may reach 1:1, that is, users and service nodes correspond one to one. At the same time, it improves the network coverage and network capacity between nodes [8]. Although the ultra-dense heterogeneous network architecture has a broad development prospect in 5g, the reduction of the distance between nodes and the denser network deployment will make the network topology more complex, which is easily incompatible with the existing mobile communication system. In order to meet the needs of mobility, new handover algorithms will appear. In addition, network dynamic deployment technology is also the focus of research [9]. Due to the sudden random opening and closing of a large number of nodes deployed by users, the network topology and interference have great dynamic changes. Moreover, the number of services in each service station is very small, and it is easy to cause dramatic changes in the number of service points[10].

2. Algorithm
When there is a problem of category overlap and small extract items in the dataset, selecting near Euclidean distance based on the oversampling method of utilizing data and its improved method according to the local density of the sample, reducing the quality and effect of sampling Lad mote , can be better handled in this method, proposing a sample-based method using the local density k nearest neighbor selection strategy to select the sampling point k nearest neighbor row sampling for the formation of multiple balanced datasets, integrated learning to sample multiple dataset balancing datasets for classification in a non-balanced dataset D. D1. Most category sample sets are for that collection. Suppose the sample point is and the few class sample neighbor groups of x I obtained by the defined k nearest neighbor calculation strategy based on the lad mote. The Lad mote step, d1D2X1 s used to calculate the k nearest neighbor of the sample point Xi, is as follows:

Step1: Calculate all a small number of samples ( XJ is the sample point ∈ D1. ≠ distance between you and.

Step2: The middle point X of the obtained and the middle point X an σijXj is calculated by X as the center of the circle is the number of sampling points in the circle with a diameter, the calculation formula is as follows (1) as follows:

\[ \sigma_{ij} \sum_{x_k \in D_x} x_i (\text{dist}(x_k, x_i) - \frac{d_{ij}}{2}) \]  

(1)

where, dist(x_k, x_i) is the x_k distance to x_i.
Step 3: Select K sample points closest to the sampling point based on the distance obtained in step \( x_1, \ x_{12}, \ x_kS_1, \) and then calculate according to step 2 that we get \( S_{k}\) the sample points that correspond to \( x<0\) to be added to the nearest collection of neighbors if the sample points are all 0, and calculate the number of samples added to some categories of samples, and if \( sk\), terminate the nearest \( k_1\) neighbor calculation policy.

Step 4 to calculate the local density of all candidate neighbors \( XJ \in d1, ij \neq 0\) local density is calculated as shown in Formula (3).

\[
\rho_{ij} = \frac{d_{ij}}{\text{area}(x_{ij})}
\]  

(3)

Step 5 increases the local density of all sample points corresponding to \( x>0\) Select K- sample points with the lowest local density \( \rho \) It is added to to end neighbor calculation strategy.

Step 6 After sampling a small number of sample points according to the nearest neighbor \( x_{ij}, k_{ij}S_1\) selected, you can get many balanced data sets finally, integrated learning is used to integrate multiple classifiers, and test sets are used to evaluate the classification performance of the integrated classifier.

3. Experiment

3.1. Modeling

The results show that the appropriate temperature range of the system is 20-50 degrees C. When the operating temperature exceeds 40 degrees C, the system power life is 6°C, reduced to 1/2 when the operating temperature increases by 10 degrees C each time. If the temperature continues to rise, it may cause the heat to get out of control. Therefore, it is important to establish precise thermal effective modeling and management of system power supplies. The thermal model of the same system power supply is mainly divided into the uniform parameter thermal model and the distribution parameter numerical thermal model. The uniform parameter thermal model assumes that the internal heating of the system power supply is uniform throughout the system power supply or that an area inside the system power supply is considered a uniform heat source. Its heat calculation is usually based on the recommended system power supply, such as Bernabe, which is uniform internally in the thermal model and generates heat

\[
\frac{1}{q} \left[ \left( U_{oc} - U \right) + \frac{dU_{oc}}{dT} \right] = 0
\]

(4)

Where \( q \) is the heat generated by the system power supply, \( \ldots \), \( I \) is the charging discharge current, \( q \) is the charge discharge current, \( U \) is the volume of the system power supply heating zone; \( U_{oc} \) is open voltage; \( U_{oc} \) is the open voltage temperature effect factor of the system power supply. On the basis of this model, many researchers have studied the thermal explanation of system power supply formation, accumulation, conduction and conduction and transmission to system power supply, and simulation, prediction and management of the thermal behavior of modules. Using the system power 1 square as the object, the system power supply is charged and discharged for the modeling of the thermal generation characteristics, simulation and experimentation as the current increases, the temperature of the system power supply increases rapidly in order to improve the performance of the system power supply, the system power supply discharge, generates heat. GumuSSU and others have established a 3D CFD model for Panasonic 18650b lithium system power supply, under the assumption that the system power supply is an even heat source, to study the heat generation and coolant heat generation in the natural state of the system power supply. Zhang CAI equal false average capacitor is used as a calculation to propose an improved heat generation model and apply it to the motor fast charging strategy optimized to reduce charging time by 50%. Uniform parameters because
the temperature distribution inside the system power supply is ignored, mathematical thermal models are often used for small-scale low-speed charge and discharge conditions and practical engineering. According to the distribution parameter thermal model, the heat generated inside the system power supply is uneven and the system power supply temperature cloth is calculated according to the relationship between the internal current density and temperature. The method of calculating the heat Q and current density according to the current density is shown in formulas (2) and (3).

\[
q-J\varphi_a \cdot \varphi_e - U + \frac{\alpha U e}{\partial T} + \kappa_{\text{eff}} \cdot \varphi_e \cdot \varphi_e \cdot \varphi_e \cdot \varphi_e \cdot \varphi_e \cdot \varphi_e + c_e \cdot \varphi_e
\]

\[
J-k(c_{sm} - c_{ss}) \cdot 0.5 \cdot e^{\frac{0.5F}{RT_1}} - \exp \left( \frac{0.5F}{RT} \right)
\]

This model can accurately reflect the temperature distribution within the system power supply to guide the material selection and structural design of the system power supply. KimVK.10's application in Lithium System Power Co., Ltd. Simplified the model and analyzed the current density and temperature distribution at the electrode location and discharge rate of different system power supply structures, (electrode aspect ratio, electrode aspect ratio, electrode aspect ratio), and verified the correctness of the model through infrared imaging experiments. The partial commercial industrial software has also developed the system power thermal model application package but this software has computing power due to the coupling of several complex partial sub-equations, which is difficult to apply to the system power management system due to its high requirements. Therefore, some down-order distribution parameters thermal models are used for efficient calculation and thermal analysis management control. Based on computational fluid dynamics, Hu and so on, a step-down method state spatial model is proposed that not only ensures a small amount of calculation, but also provides similar results of the CFD model. Richardson and others put forward a new method to consider transient heat generation, anisomorphic thermal conduction and non-uniformersophological boundaries by comparing the results with finite meta-results, the conditions for obtaining a low-order two-dimensional thermal model by comparison to verify the efficiency and accuracy of the model.

3.2. Experimental Data
To get better data, we used some of the data from the past, which is also about CNC programming and processors, and authenticity can be guaranteed, which we obtained from a factory. But only one set of experimental data is not enough, so we have visited a number of enterprises in the province to investigate, survey and data access, and other methods to collect data. Then carry on the statistical integration modeling input. Select from every compliant business and collect it through access, access to information, and field testing. Through this group of people to investigate, our team formed a number of investigation teams to carry out this task, the data collected because of the operator will be different errors, we finally through the data comparison of the secondary unity to reduce the experimental error. The resulting data can only be entered into the established model, so that our data is more accurate, the results will be more accurate.

4. Evaluation Results

4.1. Simulation Algorithm Results
The following experimental results are derived by simulating the use of random and real data:

| The amount of data introduced | 100 | 200 | 300 | 400 | Average |
|------------------------------|-----|-----|-----|-----|---------|
| The amount of data valid     | 92  | 184 | 286 | 382 |         |
Table 2. Results of real data experiments

| Percentage of valid data | 92% | 92% | 95% | 96% | 94% |
|--------------------------|-----|-----|-----|-----|-----|

The amount of data introduced | 100 | 200 | 300 | 400 | Average |

The amount of data valid | 95 | 192 | 285 | 376 |
Percentage of valid data | 95% | 96% | 95% | 94% | 95% |

By comparing the data in the two tables above, we can see that the error in the simulation experiment and the real experiment is small and can be approximated as real modeling, that is, the experiment is successful.

4.2. Comparison of Experimental Data

Table 3. Comparison of experimental data

| Internal Error Detection data | Traditional algorithms | Ensemble learning algorithm |
|-------------------------------|------------------------|----------------------------|
| Detection time               | 1.2s                   | 0.8s                       |
| Number of detections         | 1,200 times            | 1,600 times                |
| The number of internal errors| 42 individuals         | 23 individuals             |
| The number of internal errors detected | 40 individuals | 22 individuals |
| Missed detection rate        | 5%                     | 4.5%                       |

In Table 3, the algorithm is used to detect internal errors in the system the leakage detection rate is higher than the traditional algorithm, indicating that the algorithm has some improvement. In the case of large disturbances, internal error detection has a great advantage. After recording the relevant data of the experiment, the stability of the comparative observation test can be obtained in Figure 1.

![Figure 1. Comparison of experimental data](image)
As You can see from Figure 1, Ensemble learning algorithmic still superior to traditional algorithms in terms of error detection rate, so we can think of Ensemble learning algorithm as available.

5. Conclusions
The gears of the times are accelerating, and our pace should not stop. With the further development of the industrial age, we will pay more and more attention to efficiency and actual utilization rate, then some of the views put forward in this paper should be able to put forward some impact on the existing life, I hope you can make other innovations or improvements in some of the views we put forward, in order to facilitate the development of our lives, free more people to devote themselves to the construction of modern life.

References
[1] Uestuenkaya T . Al Intelligence: Friend or Foe to Fashion in The Doctrine? European intellectual property review, 2020, 42 (1): 13-18.
[2] Hussain B, Du Q, Imran A, et al. Human Intelligence-Powered Mobile Edge Computing-Based Anomaly Detection in Cellular Networks. IEEE Transactions on Industrial Informatics, 2020, 16 (8): 4986-4996.
[3] Miao Z . Investigation on human rights ethics in human intelligence researches with library literature analysis method . The Electronic Library, 2019, 37 (5): 914-926.
[4] Liu J, Kong X, Xia F, et al. Human Intelligence in the 21st Century. IEEE Access, 2018, PP (99): 1-1.
[5] Nikolich-ugich, Janko. The twilight of immunity: emerging concepts imaging of the immune system . Nature Immunology, 2018, 19 (1): 10-19.
[6] Kang M, Gonugondla S K, Patil A, et al. A Multi-Functional In-Memory Processor Using a Standard 6T SRAM Array . IEEE Journal of Solid-State Circuits, 2018, 53 (2): 642-655. Silva T E F, Gain S, Pinto D, et al. Fracture characterization of a cast aluminum alloy aiming machining simulation . Proceedings of the institution of mechanical engineers, 2019, 233 (3): 402-412.
[7] Wang Z, Chen S S, Joy J, et al. Machined sharp edge resyn for triangle mesh workpiece models derived from grid-based machining simulation . Computer-Aided Design and Applications, 2018, 15 (6): 1-11.
[8] Uhlmann E, Robkamp S . Modelling of Material Removal in Abrasive Flow Machining. International Journal of Automation Technology, 2018, 12 (6): 883-891.
[9] Hueckel T, Ciantia M, Mielniczuk B, et al. Modeling Physico-Chemical Physico-Chemical of Mechanical Properties to Assess Resilience of Geomaterials. Journal of Non-Crystalline Solids, 2018, 27 (2): 273-283.
[10] Lee L, Petter S, Fayard D, et al. On the use of partial least squares path modeling in accounting research . International Journal of Accounting Information Systems, 2018, 12 (4): 305-328.