Research on Medical Robots Based on Convolutional Neural Network: Drug Transportation System and E-commerce for Neurodigestive Diseases

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Abstract. The research team designed medical robots for patients with neurodigestive diseases, mainly using convolutional neural networks to achieve robot positioning. We designed the primary model of the drone and used a spatial Cartesian coordinate system as a reference system to conduct positioning research. Finally, by analyzing the current situation of multiple disease relapses and conducting drug related questionnaire surveys, we verified the necessity of drug delivery robots, Convolutional neural networks have been implemented to achieve spatial positioning of robots.

Keywords: Intelligence; computer science; neural network; economics; medical robot; E-commerce.

1. Introduction

The recurrence of irritable bowel syndrome and drug abuse in depression may show some clear warning signs in the early stages. Parents and guardians should closely monitor these signs, as well as sudden changes in the child's behavior and lifestyle. Hospitals at all levels have serious irrational use and abuse of antibiotics, as well as indiscriminate use of antibiotics and irrational combination therapy. Health authorities and hospital managers need to have new ideas and measures to control the abuse of antibiotics. This article designs a drug transport robot that can alleviate the above situation, which is not only applicable to IBS diseases, but also to other fields. [1-5]. Drug abuse addiction has become one of the important social problems in the world today. It not only endangers human physical and mental health, but also seriously interferes with social peace and production development. The research team believes that the non-standard sale of drugs needs to be given more attention in medical work in the future, and further improved and perfected to reduce and reduce the abuse rate and drug overselling rate.

2. Model design details

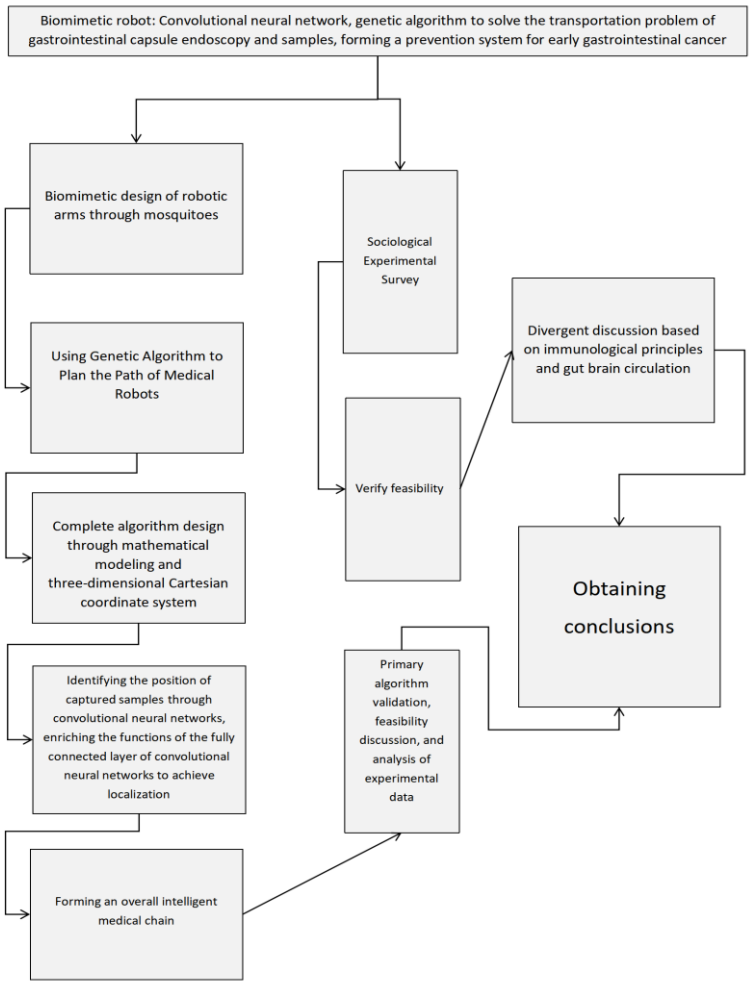


Figure 1. Operational flowchart.

As shown in Figure 1, this is the overall workflow diagram of the robot we designed. We have designed various classifications of principles and situations in the diagram, and detailed the engineering functions of each section.

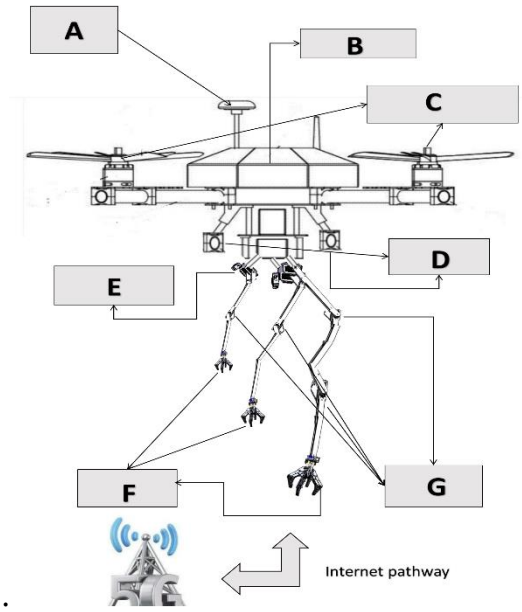


Figure 2. Drone structure diagram.

As shown in Figure 2, A is the sensor, B is the signal control system, C is the power equipment, D is the robotic arm, E is the bearing, G is the directional equipment, and F is the mechanical claw and throwing equipment. In the overall calculation process, the accumulation of data manually implemented by the primary model is the foundation for forming the overall automation processing.

From Figure 3, we demonstrate the working foundation of convolutional neural networks. In Figure 4, we demonstrate the mathematical principles of convolutional neural networks. In Figure 5, we visually analyze the feasibility of using a spatial Cartesian coordinate system as the basis for convolutional neural network position classification.

From Figure 1 to Figure 5, we have analyzed the details and mechanisms of the overall operation process. In the overall process, we have designed a primary model, and the gradual implementation and data accumulation of the primary model are the core parts of forming artificial intelligence. We propose this primary model mainly to solve the problem of media in the drug transportation process, and most of the details and mechanisms have been annotated in the figure. Due to the current situation in clinical institutions where there are too many words providing drugs, which may cause harm to patients, we propose this drug transport robot model with the aim of alleviating the current problem of drug abuse and attempting to propose new drug use monitoring methods.

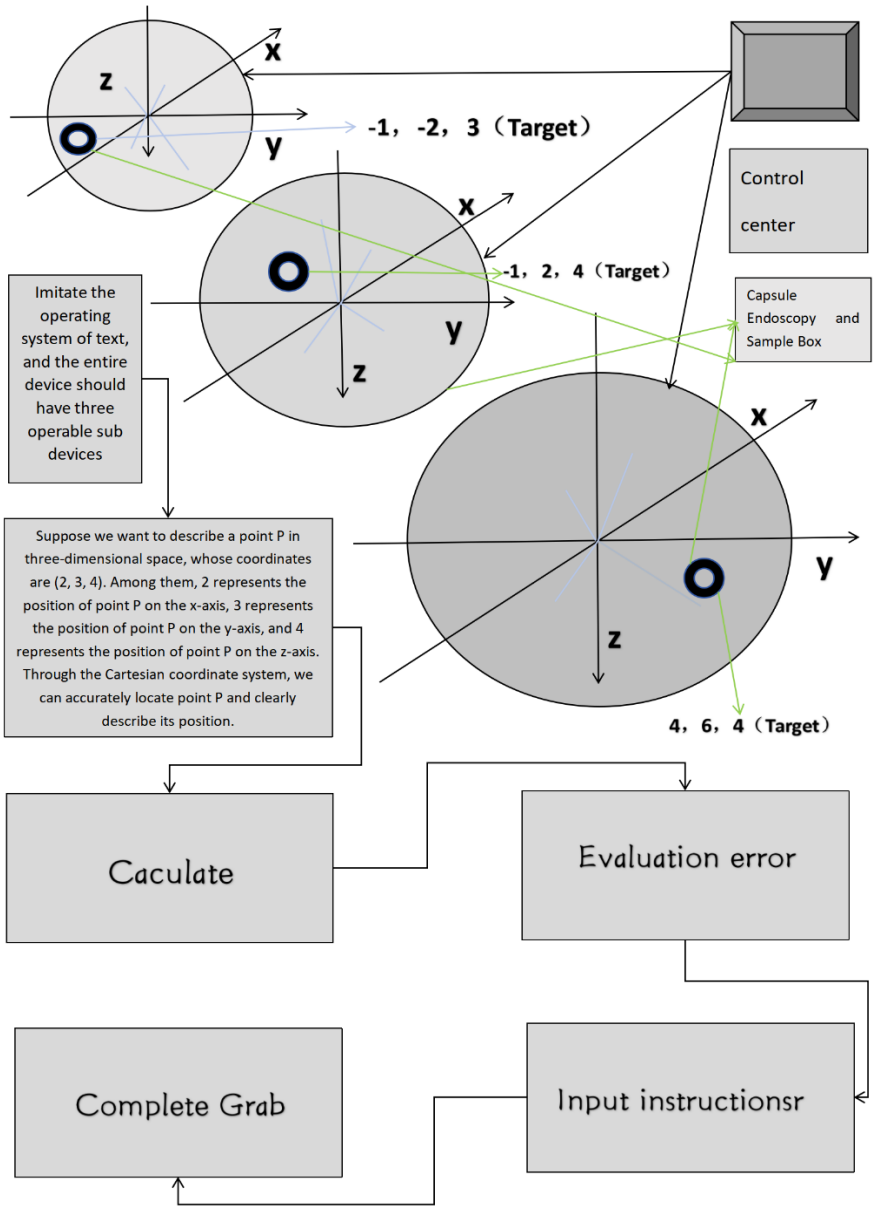


Figure 3. Convolutional neural network operation diagram inside drones.

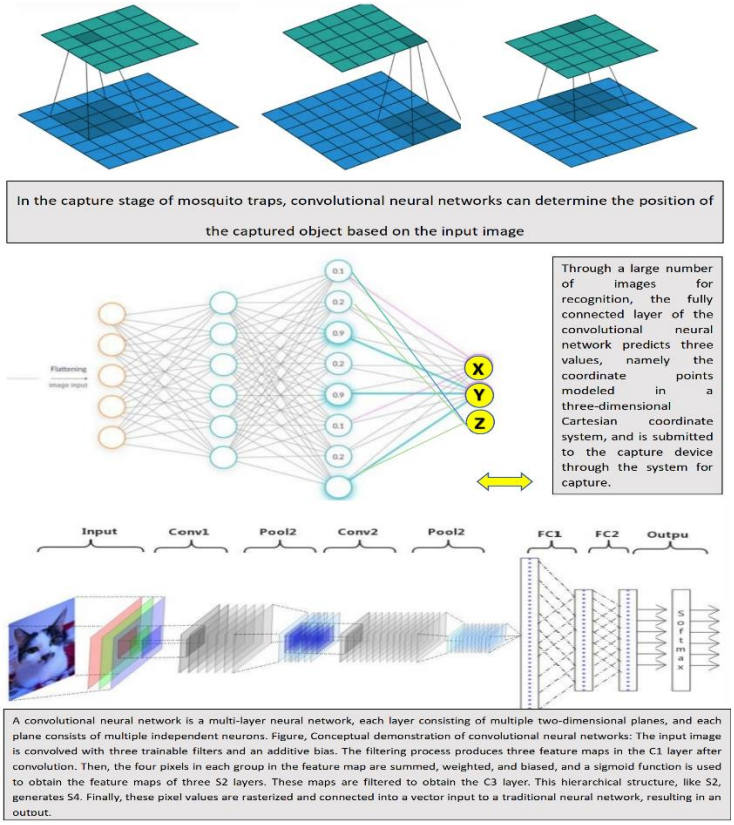


Figure 4. The working principle of convolutional neural networks.

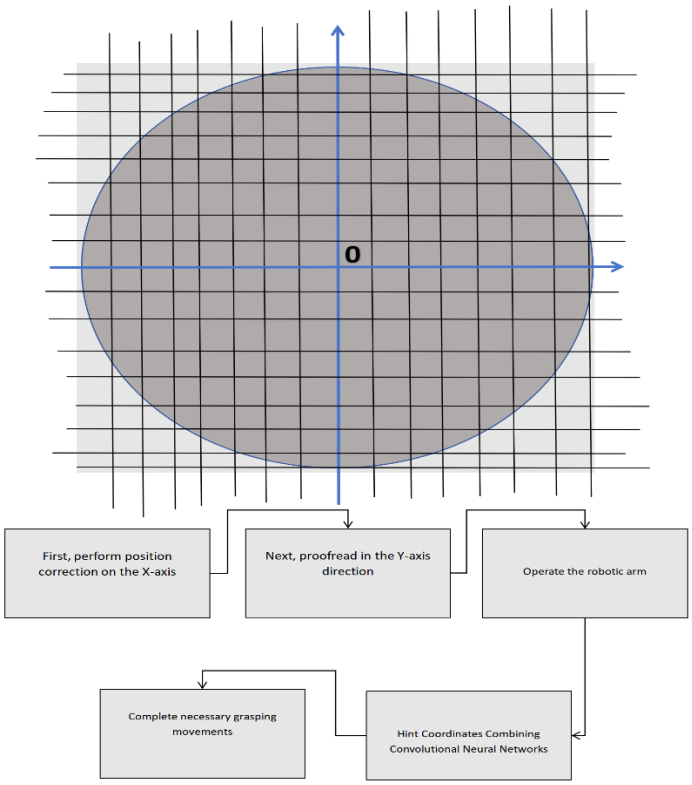


Figure 5. The operating principle of the control system.

3. Principles of E-commerce Systems

1. Internet companies should not just view the Internet as a single technology, but as a tool for making money.

2. Only in this way can it be possible to create demand through original supply, continuously adjust supply with initial demand, and form new supply and demand.

3. This is a spiral upward process, and finally, when demand dominates supply, new industries are formed.

4. Experimental Design and Data Analysis

We analyzed the current number of research achievements in medical artificial intelligence in China. Bibliometrics was used in experiments on CNKI. Search for Drug transport robots.

We analyze that there are currently a large number of medical intelligent research in China, and there are broad prospects in the future. In the future, we should explore and practice a new path of innovative development from being strong in talent and technology to being strong in industry, economy, and country. Firmly establish the concept of "science and technology first", from industrial layout to the implementation of Megaproject, always take scientific and technological innovation as the logical starting point of promoting work, and run through all work of the party and the state.

We used the following code to recognize computer images from 9 different locations.

conLayer = [20,20,4,1,2; 20,20,8,1,2; 20,20,16,1,2];

poolingLayer = {'maxPooling2dLayer',40,40,2,0;

'maxPooling2dLayer', 40, 40, 2, 0;

'maxPooling2dLayer', 40, 40, 2, 0}; fcLayer = [];

But the effect is not ideal, which may be related to our relatively low data volume.

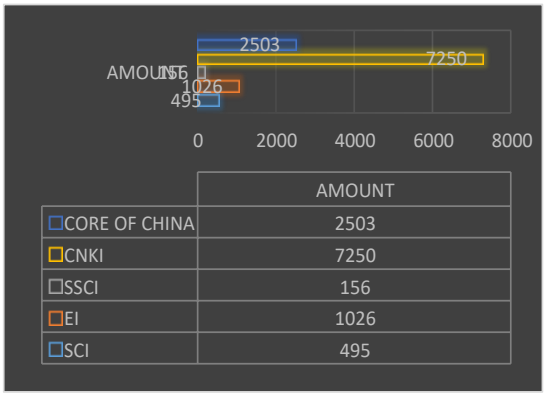


Figure 6. Data analysis of research.



Figure 7. Structure diagram of convolutional neural networks.

We believe that the structure of the convolutional neural network is not a problem, but we need more data because the current primary model has not obtained enough data. Therefore, it can be observed from the confusion matrix of the convolutional neural network in Figure 8 that there are more classification errors, but the model in Figure 7 is feasible.

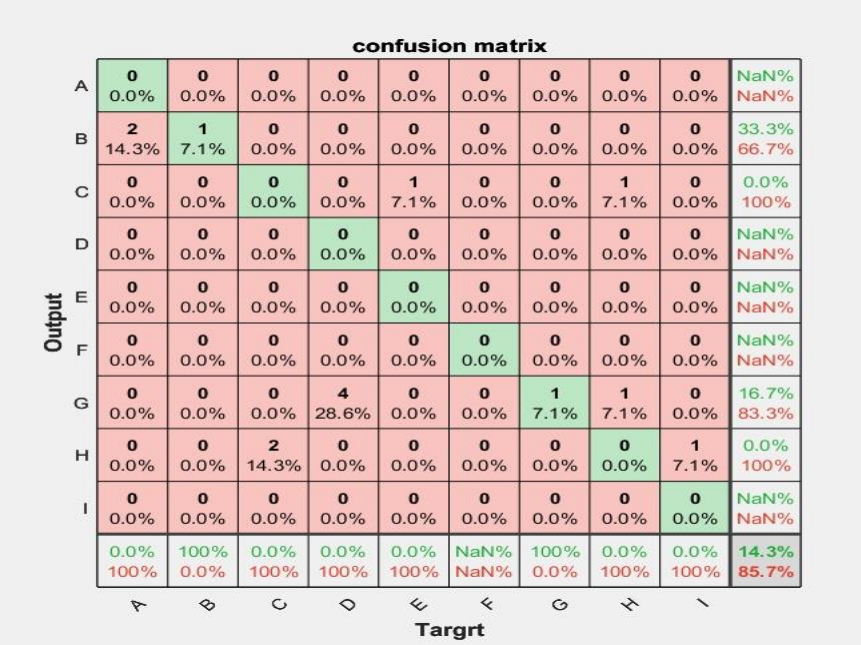


Figure 8. Confusion matrix (training results for position classification using images of coordinate systems between simulated spaces).

Detail of train: Layer 1 (nnet.cnn.layer. ImageInputLayer): OUTPUT SIZE = [768 768 3], Layer 2 (nnet.cnn.layer.Convolution2DLayer): OUTPUT SIZE = [753 753 4], Layer 3 (nnet.cnn.layer. BatchNormalizationLayer): OUTPUT SIZE = [753 753 4], Layer 4 (nnet.cnn.layer. ReLULayer): OUTPUT SIZE = [753 753 4], Layer 5 (nnet.cnn.layer.MaxPooling2DLayer): OUTPUT SIZE = [357 357 4], Layer 6 (nnet.cnn.layer.Convolution2DLayer): OUTPUT SIZE = [342 342 8], Layer 7 (nnet.cnn.layer. BatchNormalizationLayer): OUTPUT SIZE = [342 342 8], Layer 8 (nnet.cnn.layer. ReLULayer): OUTPUT SIZE = [342 342 8], Layer 9 (nnet.cnn.layer.MaxPooling2DLayer): OUTPUT SIZE = [152 152 8], Layer 10 (nnet.cnn.layer.Convolution2DLayer): OUTPUT SIZE = [137 137 16], Layer 11 (nnet.cnn.layer. BatchNormalizationLayer): OUTPUT SIZE = [137 137 16], Layer 12 (nnet.cnn.layer. ReLULayer): OUTPUT SIZE = [137 137 16], Layer 13 (nnet.cnn.layer. MaxPooling2DLayer): OUTPUT SIZE = [49 49 16], Layer 14 (nnet.cnn.layer. FullyConnectedLayer): OUTPUT SIZE = [1 1 9], Layer 15 (nnet.cnn.layer. SoftmaxLayer): OUTPUT SIZE = [1 1 9], Layer 16 (nnet.cnn.layer. ClassificationOutputLayer): OUTPUT SIZE = [1 9], Right rate: 0.14286

5. Discussion

Currently, with the development of science and technology, the research and development speed of artificial intelligence products is getting faster and faster, and human society has entered an irreversible trend of intelligence. As the prototype of intelligent robots, intelligent cars can be unaffected by temperature, humidity, space, magnetic field radiation, gravity, and other conditions. They can perceive external environmental information and their own status through internal and external sensors, and complete corresponding actions. Often used in situations where humans are unable to work, it can also replace humans in certain complex and dangerous tasks. To achieve detection tasks that humans cannot enter or survive in environments, suitable for multiple fields such as national defense and civilian use. After the outbreak of COVID-19 flu, AI technology has played an important role in public opinion prevention and control, auxiliary diagnosis and treatment, material allocation and even new drug research and development. Medical robots have efficiently replaced

medical staff to complete their work, reducing or even avoiding many unnecessary losses, and preventing more people from being infected through uninformed contact. Robots have played a great advantage in this epidemic prevention and control.

Medical robots are intelligent robots with a wide range of perception systems, artificial intelligence, and simulation systems, which can assist in treatment and management of hospital services. The intelligent medical assisted medication delivery robot designed in this project uses convolutional neural networks to determine location information and achieves timed medication delivery through a microcontroller timer. The research team believes that the design of this preliminary model can be improved in the future by combining more technologies.

6. Conclusions

We have implemented part of this model and demonstrated its feasibility through computer code, but we believe that in the future, more relevant teams should work with us to improve the accuracy of the convolutional neural network, and at the same time implement the UAV throwing equipment. This primary model can alleviate the current medical situation and provide more favorable help for doctors.

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