

Some Key Technologies of Deep Learning in the Field of Computer Vision

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Keywords: Deep Learning, Field of Computer Vision, Key Technologies

Abstract: In recent years, with the continuous development of science and technology, computer vision has also been a rapid development opportunity, and it is also an important research direction of deep learning. For example, from the previous large-scale visual recognition competition to the current stage of go man-machine war, we have seen the infinite potential and vigorous vitality of computer in the field of vision. The development of computer vision field cannot be separated from the important role of deep learning in it. Therefore, deep learning is of great significance to the development of computer vision and artificial intelligence, and also changes people's way of life. However, due to the complexity of deep neural network maze design and the lack of tagged training data, the development of deep learning in the field of computational vision has also encountered some difficulties. This paper analyzes some key technologies of deep learning in the field of computer vision, hoping to play a reference role for relevant researchers.

1. Introduction

The emergence of deep learning is that people's thinking of dealing with computer vision problems has changed, and both computer vision and artificial intelligence have a direct impact on people's lives, such as face recognition, illegal monitoring and other applications. And any high-tech products are inseparable from the efforts and exploration of scientific research workers. In today's information age, not only the development of computer hardware technology, but also the depth of learning technology to promote important theories and algorithms. Deep learning is mainly based on the development and improvement of deep neural networks, thus achieving very remarkable results in the field of computer vision. For example, algorithms such as image monitoring and classification competitions use depth-learning algorithms to achieve a lower level of image discrimination than the human eye. In addition, there are many important achievements, which are related to the auxiliary role of deep neural networks. It can be seen that deep learning has initially realized its own value in the field of computer vision, therefore, the relevant researchers should strengthen the research on the key technology of deep learning in the field of computer vision, so as to further improve the application level of deep learning.

2. The Research Status of the Key Technologies in the Field of Computer Vision

In the research work in the field of computer vision, whether it is the traditional face recognition function or the new biomedical image retrieval function, there are some difficulties in the research process, so it is necessary to avoid the interference of various factors. For example, in the application of face recognition, it is necessary to analyze the relevant factors such as illumination and occlusion. In single target tracking, the factors such as appearance change and morphology need to be analyzed. Through these phenomena, we can find that there are still some shortcomings in the application of existing deep learning techniques. In the field of face recognition, in order to effectively reduce the interference of illumination, occlusion, expression change and other factors, researchers mainly seek solutions from dimensionality reduction ideas and feature selection, and its main research direction is to be able to find hidden key information from the original face image. And from the development process of single target tracking, it is mainly divided into two types, the first is the type of production, and the second is the type of discrimination. The most similar targets are selected in each frame based on the appearance of the target. However, the discriminant single-

object tracking mainly takes the target problem as a box classification problem, and the target needs to be accurately identified in the complex environment through the training of the robust classifier. In designing the multi-objective tracking model, some algorithms have been proposed in order to effectively solve the related problems encountered in the multi-objective tracking process. The earlier algorithms mainly included two categories, which were based on multiple tracking algorithms and tracking framework based on particle filtering. However, these algorithms still have some shortcomings in the concrete practice, such as the target is lost in the tracking process, it will be difficult to capture the target again. Therefore, experts and scholars later explored a combination of future frame target location information to achieve multi-target tracking, and this tracking algorithm is a very popular way. It can be seen that there are some difficulties in any field of computer vision research, so both the traditional ideas and the theory of deep learning should be further promoted, especially to realize the potential of deep learning in the field of computer vision, so that it can play a greater role.

3. Analysis of the Key Technologies of Deep Learning in the Field of Computer Vision

3.1. Face Recognition Technology

The present technology of face recognition algorithm still has some limitations in its feature representation ability design. For this, experts and scholars have proposed a deep learning face recognition algorithm. This technique firstly constructs a deep neural network to simulate the human brain target recognition process better, thus completing the feature learning and specific recognition of the human face target. When the human brain recognizes the image, it needs to start with the features of the pixel level, and then extract the basic shape of the image by discovering the features of points, lines and edges, and finally express and recognize the advanced semantic features of the image. The deep neural network can realize and simulate the multi-level and multi-level learning and extraction of features. After constructing the deep stack denoising self-encoder neural network framework, it can complete the off-line model training of the deep learning framework through the large-scale unlabeled image set, and then build the informant in the face recognition neural network framework. It can be proved that the deep learning recognition algorithm can obtain the recognition results more accurately, and it has strong anti-interference ability for the factors such as illumination, expression change and occlusion in face recognition.

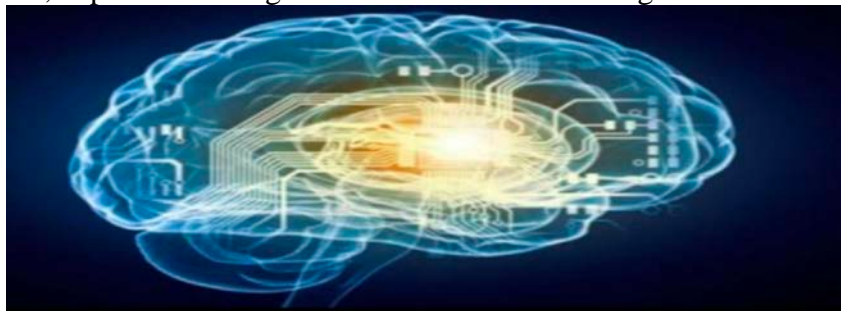


Figure 1 Related algorithms

3.2. Single Target Tracking Algorithm

At present, the more popular single target tracking algorithm may occur the phenomenon of target loss in the process of dealing with various interference factors. therefore, relevant experts and scholars have proposed a single target tracking calculation that sets deep learning and preference learning, which can better show the advantages of deep learning and preference learning in the single target tracking process. In the specific tracking process, the depth features of the target can be excavated and extracted by applying the depth learning technology, so that the multiple factors of the target in the tracking process can be obtained. For this, we can regard the target tracking problem as a preference learning problem, but in the traditional preference learning technology lack of application in the image field and specific testing, after a lot of experiments and attempts, we can

find that this new single target tracking algorithm has a very significant tracking effect, and can accurately locate the tracking target in each frame. Compared with the traditional single target tracking algorithm, it can be found that this new single target tracking algorithm and tracking concept can play a good role in promoting the research of tracking targets.



Figure 2 Corresponding research

3.3. Multi-Target Tracking Technology

In the traditional multi-objective tracking technology, there are some problems such as slow research and obsolete technology. Therefore, experts and scholars have proposed a multi-objective tracking algorithm based on depth framework after applying the theory of deep learning. Neural network plays a very important role in the field of computer vision and has achieved excellent performance. Therefore, we can use deep learning to construct a concrete multi-objective tracking system. In the multi-target tracking task, the related factors that need to be dealt with mainly include shape change and occlusion, background factors and so on. Therefore, in the process of studying the multi-objective tracking algorithm, two key technical problems are considered and studied. First of all, it is how to extract the features of the interference factors existing between multiple targets in the tracking process. Secondly, how to update the multi-target tracking system when the interference factors affect the tracking process, so as to better prevent the occurrence of target loss. using the deep learning multi-objective tracking algorithm can effectively learn and extract the features of the target image through the sdac neural network. the online learning and model updating operation of the target features can be realized by recording the time information features of the target and the particle filtering technique. Through the concrete practice, we can find that this algorithm has strong ability to use and high accuracy, and it provides important technical support for the research of multi-objective tracking.



Figure 3 Internet + artificial intelligence

3.4. Biomedical Image Retrieval Technology

According to the research progress of biomedical image retrieval technology in China, experts and scholars have proposed a deep preference learning retrieval system. By analyzing the popular biomedical image retrieval algorithm, we find that image feature representation and matching strategy are the main research objects of image retrieval technology at present. therefore, aiming at the deficiency of the two technologies in the research, a method of using the deep learning feature extraction technique and establishing the biomedical image preference model is proposed to construct a new biomedical image retrieval system. It can design relevant preference retrieval models according to different biomedical images, which reduces the use of training data and has strong real-time performance.

4. Conclusion

To sum up, deep learning has very important application value in the field of computer vision, and it also has great contribution to all fields of computer vision research. However, the key technologies of deep learning can play a very important role in promoting the progress of scientific research. Therefore, relevant experts and scholars should strengthen the research on the key technologies of deep learning in the field of computer vision, so that it can be fully applied in the field of vision, play a greater value, and promote the rapid development of scientific research in China.

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