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Discussion about the advantages of artificial intelligence technology and its case study in computer networking technology

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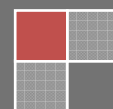
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ABSTRACT

As an extension of people's intelligence, the artificial intelligence technology has entered into a new field of technology and the prospect of its application in many fields is very wide. These fields cover work, life and entertainments and so on. As the method of scientific research is changing, the functions of computer are also changing. In the former researches, the computer mainly solves the numerical calculation. At present, the computer has applied in the field of knowledge processing. During the transformation of functions of computer, the core is the artificial intelligence technology. From the point of computer networking technology, in the computer networking, the artificial intelligence technology has spread to each link of the development and promoted the development of the computer networking into a new stage of intelligent network. Through the analysis above, artificial intelligence technology makes the computer networking technology more efficient, more intelligent, safer and quicker. This research briefly introduces the artificial intelligence technology. And through the analysis about the practical problems in computer networking technology nowadays, the research discusses the importance of the artificial intelligence technology in each field. Besides it elaborates on the application of artificial intelligence technology in computer networking technology and gives examples to verify the neuron algorithm in the field of game. From the point of computer networking technology, in the computer networking, the artificial intelligence technology has spread to each link of the development and promoted the development of the computer networking into a new stage of intelligent network.

KEYWORDS

Artificial intelligence technology; Computer networking technology (CNT); Network security; Neuron algorithm.



INTRODUCTION

As the science and technology is progressing continuously, the requirements of network of computer are also changing. In this big environment, as for CNT, people has put forward new requirements which are not only simple numerical calculation or problem solving but also intelligent requirements and even humanized service. Though the computer networking technology has made rapid progress, there are many problems need to be solved especially in the field of security. All of these remind people the importance of application of artificial intelligence technology in computer networking technology^[2].

Artificial intelligence technology is an integrated subject that integrates computer, linguistics and physiology and many other subjects. It is not only a subject but also an integrated technology filled with challenges. The purpose of artificial intelligence technology is with the help of network of computer and algorithm and other machines to make the machine have people's intelligence and replace people completing the complex and difficult work in a dangerous environment and ensure people's security and improve the efficiency. Compared to the natural intelligence and mankind intelligence, the artificial intelligence is a brand new field in which the operator orders the equipment or system and simulates people's activity. As a kind of practical technology, artificial intelligence integrates knowledge of many subjects^[3], its development closely related to the these subjects especially the computer technology. The functions between computer science and technology and artificial intelligence are bidirectional. The development of computer technology plays a key role in artificial intelligence and depends on the development of artificial intelligence. The artificial intelligence can deal with uncertain information and immediately understand the situation of system resources; trace the changes; and deal with the received information and provide them to user^[4]. The artificial intelligence has the obvious advantages in the writing ability and can scientifically and efficiently integrate resources and provide them to different users and realize the sharing of resources among users which considerably improves the efficiency and benefits. Facing the intelligentized network, artificial intelligence also shows its advantages especially in the terms of learning ability and inferential capability. In the administration of networks, the artificial intelligence technology can not only save the information but also establish the information base on which integrate and summarize the information. And it finally explains the information and output the advanced information that generally scientific and accurate and considerably contribute to the promotion of the level of network.

PROBLEMS IN THE COMPUTER NETWORKING TECHNOLOGY

As the computer technology develops quickly, its application is wider and wider and people gradually focus on the network security issues. In the network management system, people mostly pay attention to two functions which are network control and network monitor. In order to fully play their roles, the first work is to ensure the accuracy of information and promptness of information processing. But the data have unchangeable features during the network transmission and most of them are irregular and are not successional. As for the computer, the former computer analysis and processing are logicalization of data and their true and false cannot be judged and let alone choosing the information. In the computer networking technology, screening the effective information from much information need the help of intelligentized realization. The development of computer not only has length but also breadth. The intelligentized realization safeguards the process of network security management. In the network of computer, the reasonable establishment of network defensive system and management system depend on the safeguard of artificial intelligence which can ensure the security of the information in each network.

THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE COMPUTER NETWORKING TECHNOLOGY

To some extent, the application of artificial intelligence meets the requirements of people showing in three fields which are intelligentizing human-computer interface; intelligentizing information service; and intelligentizing system development. There is need there is progress. These needs drive the development of artificial intelligence.

Application of artificial intelligence in network security management

In the computer networking technology, the public functions are used widely. The application of artificial intelligence in network security management is shown in three terms.

The first one is the intelligent firewall technology whose difference from other defensive system is that its recognition technology is intelligent. For example, during recognizing and processing data, the methods of statistic and decision can cut down the huge calculated amount of computer and realize the intercept and limitation of harmful information. Compared to the traditional defense software, intelligent firewall has high efficiency of security check and efficiently contains the viral transmission and invasion.

The second is intrusion detection which is a key link in the computer networking technology safety management and is a core part of firewall technology and has a key function in the safeguard of network security. The function of intrusion detection in the network of computer system directivity influences the security of system resources. The final report of intrusion detection technology is formed before three steps: screen the data; classify the data; and then dispose the report. And through the report user can get the secure state of network information immediately. The intrusion detection is mostly used in the fuzzy recognition system and other detections.

The last one is the intelligent anti-spam system safeguarding the user's mailbox. This system applies the protective technique which especially defends the junk software. And its basis is to safeguard the security of user's information on which the junk mail is scanning. And meanwhile, it remind user to deal with these information and safeguard the mailbox.

The application in the administration of networks and system assessment

The development cannot leave the development of the artificial intelligence technology. In the management of security of computer network, the artificial intelligence can be used directly or be used to manage the network of computer comprehensively. Because of the dynamics and transient of the network, it is difficult to manage the network. As the computer technology developed quickly, the administration of networks becomes intelligent. On the base of the technology of artificial intelligence, the expert-level decision and support are made. Now this method has been used widely in the information system management. For example, through the application of expert-level system, the user can apply the administration of networks as well as system assessment.

CASE STUDY

The application of artificial intelligence is very wide in the computer game. Its denotation is also large. As for some business game, excluding the design and realization of basic engine, the creative part of game is classified into the category of artificial intelligence. And in the design of game, the player always focuses on the reasonability and authenticity of the game. Though some algorithm cannot be classified into the artificial intelligence, these algorithms have intelligent activity which is belonging to the artificial intelligence. For example, as for the assault study of virtual character in the game, the application of technology can diversify the experience of player and its common process shown in Figure 1.

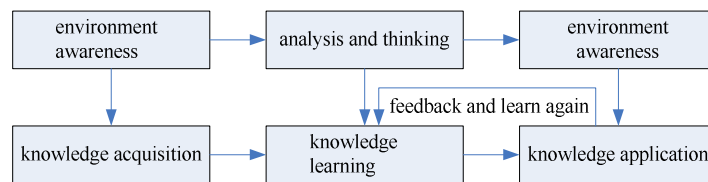


Figure 1 : The theory of intelligent machine study

Movement of the role

Role in the game is classified into the two types: one can free move, the other can change the motor direction by the steering effort. Through the design, algorithm of the role's movement has basic trace algorithm, sight trace algorithm and intercept algorithm. In the basic trace algorithm, there are results shown in Figure 2. This picture shows the track of the tracer going to the certain destination in the two-dimension plane. To some extent, realizing the trace algorithm is called basic trace algorithms which can simulate the behavior of people. The Figure 3 shows the sight trace algorithm during directivity changing the velocity vector of the tracer. And the Figure 4 shows the final result of this algorithm.

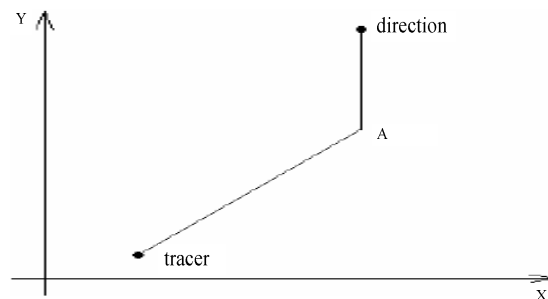


Figure 2 : The results of the trace algorithm

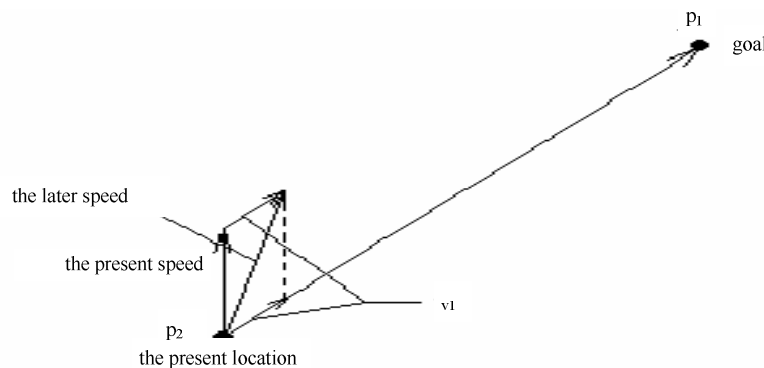


Figure 3 : Realizing the trace algorithm during changing the speed of the tracer

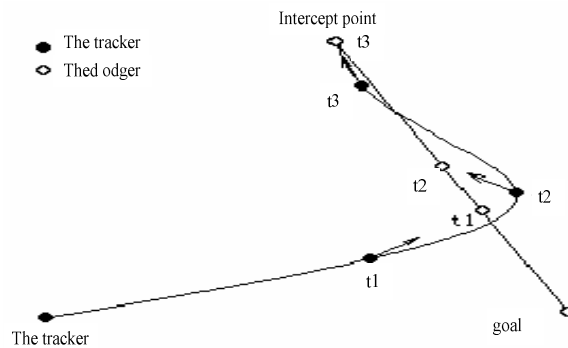


Figure 4 : The results of the sight trace algorithm

The case of shooting

This study explains the artificial intelligence technology with the case of shooting in which the background is war game and controlling the role by the nerve cell control technology. Setting this game is in a three-dimensional scene. Firstly, the thesis talks about the shooting and pointing problem facing the enemy. As for the common bullet, the role will simply aim at the enemy through the hypothesis below which the bullet had the infinite speed. This means that the process from shoot to hit is instantaneous. In this way, in the game, the role only needs to shoot the bullet towards the location of the enemy who will be hit. That is to say, when the role shoots the enemy, the target is the precise location of the enemy. In order to increase the authenticity of game, it can be added several deviations which are added randomly and depending on the simulation of the firearms scattering level. And the location can also be set according to the level of shooting. Actually, the bullet has speed and is not infinite. And there are time differences from the shoot to hit. As for the static enemy, the method above cannot be successful undoubtedly. Before the shooting, the role should consider the lead. Of course, through the speed and the initial position of the enemy, the location of the enemy can be worked out and in which the enemy would be hit.

From the description above, the conclusion is that the common bullet can easily hit the enemy. But if the bullet is the rocket projectile the shoot will be difficult. As for the angle of shoot, the hurt of the bullet is comparatively directive; the rocket projectile will hurt the enemy through the explosion. In the game, if the player use rocket projectile, he/she would not consider the initiative location of the enemy. Compared to the common bullet, the speed of the rocket projectile is slower and the time would be longer. So the estimating the position is very difficult. During the shoot of the rocket projectile, though the estimated position cannot be aimed at, only aiming near the estimated position of the object and ensuring that the explosion is near the estimated position and the enemy is in the explosion range, it can hurt the enemy. But as for the controlling of role, the simulation of the process is so serious and can be finished by the neuron network. The method is: firstly, according to the discussion, and through the speed and initiative location calculate the estimated position of the enemy; then, add a vector in the estimated position randomly which is little; finally, shoot the random vector is looked as a target and if there is no obstacle in the straight line of shoot, then repeat the second step; if there are many obstacles in the straight line of shoot, the first obstacle will the target. And if the distance between the target and the role is not in the rocket projectile's explosion range, then repeat the second step. By the method above, evaluate that whether the enemy is hurt or not. If it can hurt them, shoot the rocket projectile; if not, then repeat the second step until it hurt them. The Figure 5 shows the design algorithm of the neuron network. And the neuron network can feed forward and has three levels and three input variables which are not related with the object and example. These three input variables are current position of the enemy, estimated position of the enemy and the current position of the role. Before the calculation, these distances are normalized which division method is made with the biggest distances between cases and the scene. And the output variable is only one which is Boolean type representing hurt or not. And the training algorithm is counter propagation.

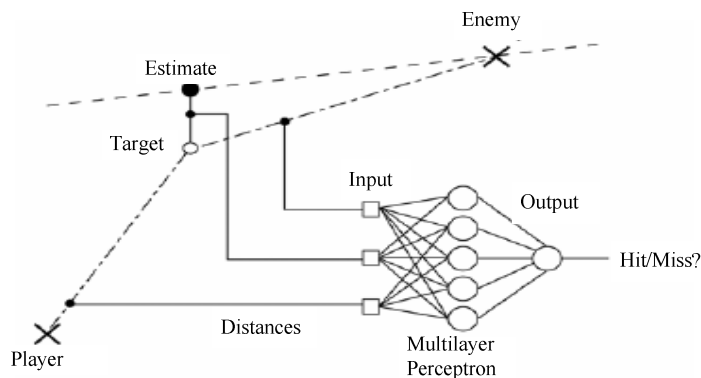


Figure 5 : The neuron network

Before the design, there is only one input variable that is dot product between the speed of enemy and ballistic rocket projectile. But during the design, when the enemy does not move, the dot product is 0 and the vertical value is 0 too. And the huge statistics shows that the included angle between the trajectory of the rocket projectile and the speed of the enemy has no relation with the practical hit rate. So in the practical design, the input value would be neglected.

When collect the experimental data, the form is the confrontation of the human player. But the practical scene is too complex and the data has many disturbances which cannot be used. In order to collect the useful data, the data should be collected automatically. So when setting the scene, the AI is supposed to control the fight of roles: when a role is died, his/her weapon is drop out directivity and the role will disappear. And the procedure will automatically create a new role without weapon. And if he meets a role holding the weapon, he must run away. And during escape, he will be treated as the punching bag. If he has good luck, he can pick up a weapon and then star fight. In this way, the fight can circulate without the intervention by hand and the data can be collected. And finally verify the aiming related with the neuron network in the shoot of rocket projectile. And the large results show that the role incline to three directions that are near the initial position of the enemy, near the estimated position and near the role of death. The design objective is one nearing the enemy.

CONCLUSION

As the extension of the human intelligence, artificial intelligence has wide applications covering work, life and entertainment. From the point of the computer networking technology, in the network of computer, the artificial intelligence has spread into each links of the development and has pushed the network of computer entering into a new stage. Through the analysis above, the artificial intelligence can make the computer networking technology more efficient, more intelligent, safer and quicker.

REFERENCES

- [1] Wang Wen-Jie, Ye Shi-Wei; The theory and application of artificial intelligence [M], Beijing: Posts and Telecom Press, (2004).
- [2] Shi Zhong-Zhi, Wang Wen-Jie; Artificial intelligence [M], Beijing: National Defence Industry Press, (2007).
- [3] Cai Zi-Xing, Xu Guang-You; The theory and application of artificial intelligence [M], Beijing: Tsinghua University Press, (2003).
- [4] Xiong Ying; Artificial intelligence and its application in the computer networking technology [J], Technology and Market, **13(02)**, 64-68 (2011).
- [5] Chen Bin; Artificial intelligence and its application in the computer networking technology [J], Technology and Market, **25(12)**, 19-26 (2010).
- [6] Zhang Kai-Fei; Application area and the future of artificial intelligence [J], Journal of Luliang HigherCollege, **12(4)**, 148-152 (2010).
- [7] Song Shao-Yun; Artificial intelligence and its application in the computer networking technology [J], Journal of Yuxi Teachers' College, **18(2)**, 142-146 (2009).