

Research on the Application of Artificial Intelligence Technology in Sports Competition

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Abstract: This Paper Takes Table Tennis Match and Robot Soccer as an Example. in the Technical Evaluation Index System and the Tactics of Table Tennis Match. the Decision Tree Thinning Process and the Attribute Reduction Result of the rough Set Are the Diagnostic Strategies of the Table Tennis Match, and the Improved Ann Technology and the Tactical Diagnosis Method Are Studied. the Results Show That the Results of Neural Networks and Decision Tree Methods Are More Stable. Robot Soccer is a Typical Intelligent System. It Provides a Standard Experimental Platform for the Theoretical Research and Model Test of Intelligent Systems. the Football Coaches in the Actual Decision-Making System, Directly Affects the Success of the Games, Which Can Reflect the Intelligent Level of the Robot Soccer System, Has Important Theoretical Significance and Practical Value to Deeply Study on the System of Strategy. Finally, the Experimental Results Are Summarized, and the Advantages and Disadvantages of the Algorithm Are Analyzed.

1. Introduction

Study on Technique and Tactics of Table Tennis Match Has Been Realized from Qualitative to Quantitative to Combine the Study of Both, Means from the Past Simply Rely on Manual Statistics to Rely on Transformation for the Development of Social Economy and Culture. Therefore, the Robot Soccer System Has Very High Scientific Research Value [3].

2. Key Technologies Involved in the Project

2.1 Artificial Intelligence Technology

Intelligence Artificial, the English Abbreviation for Ai. Artificial Intelligence is the Simulation of the Information Process of Human Consciousness and Thinking. Artificial Intelligence is Not Human Intelligence, But is Shown in Figure 1. It Has Been Getting New Progress, on the Other Hand, It Has Turned to a More Meaningful and Difficult Goal [6].

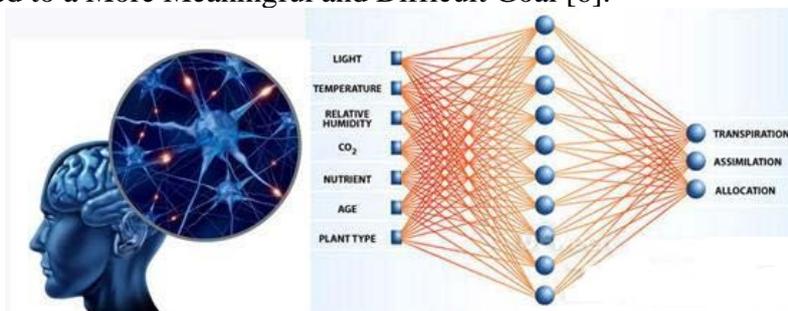


Fig.1 Sketch Map of Artificial Intelligence

2.2 Piezoelectric Sensor Technology

The Main Features of a Digital Ball Game Detection System is Composed of Real-Time

Tracking Optical 3d Motion Capturact Fere with the Discrimination Accuracy of Line Auxiliary Device; Third, Players Will Sweat Accurately Determine the Influence Line Trial Auxiliary Device[8]. the Schematic Diagram of Piezoelectric Sensor is Shown in Figure 2.

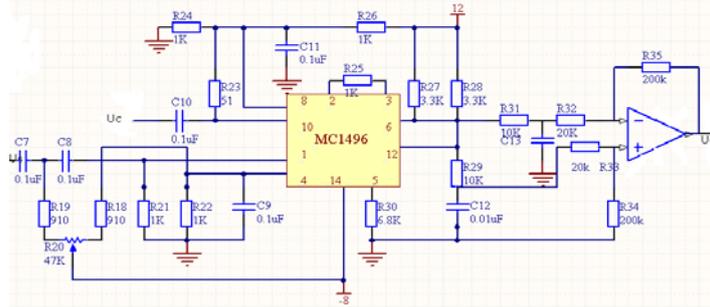


Fig.2 Piezoelectric Sensor Circuit

2.3 Hawk-Eye

The official name of the so-called “technology” is the “instant replay system”; the principle of its technology is not es of all ages. Hawkeye system is a computer system used in cricket, tennis and other sports, to track the ball path and display graphic images of the actual path record, can also predict the future path of the ball. In some sports, such as tennis, it is now part of the adjudication process. Hawkeye system diagram is shown in Figure 3.

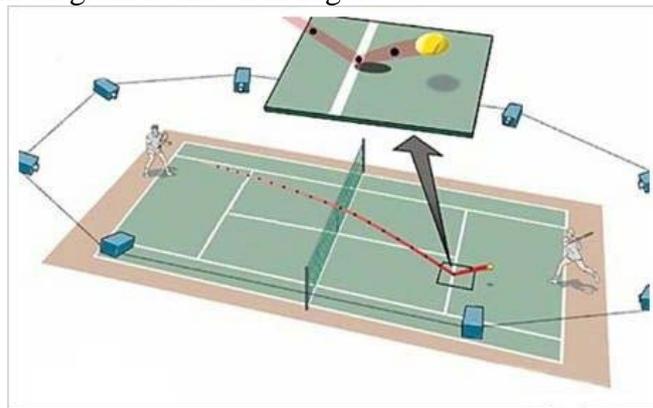


Fig.3 Schematic Diagram of Hawk-eye System

2.4 Electronic Generator Technology

The football game in the hands of the linesman side flag electronic generator, can inform the referee to discover linesman. “Football electronic referee” refers to the football player offside goals and other electronic judge sys e offside of soccer video, offside detection algorithm is designed based on the player's plane coordinates plane coordinates, so the shooting for the projection matrix. The schematic diagram of the electronic generator is shown in Figure 4.

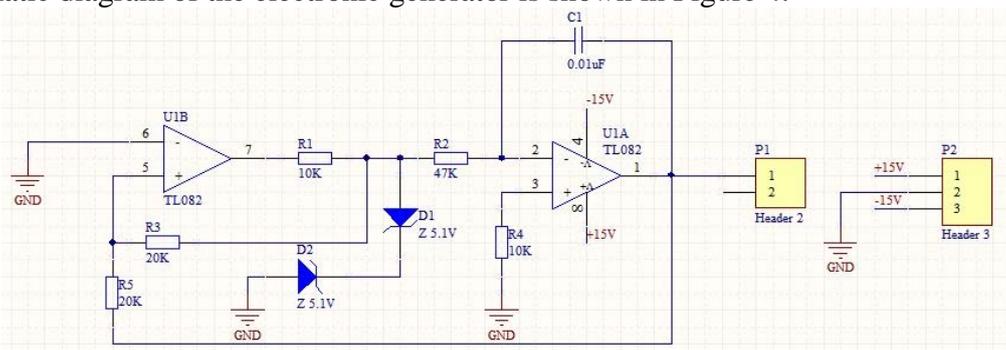


Fig.4 Schematic Diagram of Electronic Generator

3. Research on the Evaluation Index System of the Technology and Tactics of Table Tennis Match

General idea of index design

The research of technical and tactical diagnosis of table tennis matches the development of abstract and concrete in two directions. The former research is to quickly and efficiently evaluate the simple game; the requireme tgnose the technical features of table tennis players, the tactics and batting timing were combined to establish the evaluation model of tactical and tactical characteristics of table tennis athletes.

3.1 Decision Tree Algorithm

The algorithm of decision tree analysis shows that the algorithm from the viewpoint of information theory in the construction process, in each recursive process achievements are looking for attributes the maximum amount of information, and refinement of a decision tree. The decision tree in the directory already includes the at competition, and choose to fight and put a short but rarely applied technology [13]. But in the game when the flip, each sticks to his own stand. Short swing techniques often become an important factor to win the match. Decision tree algorithm schematic diagram shown in Figure 5.

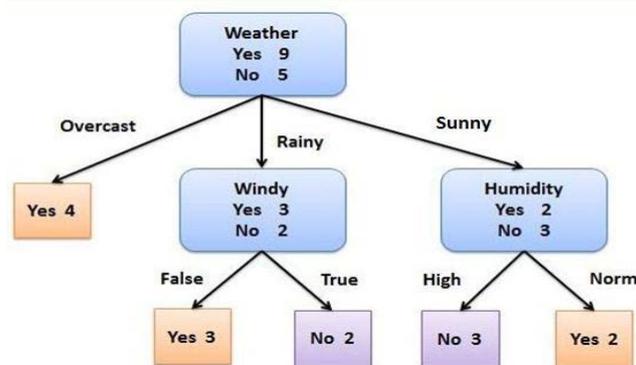


Fig.5 Sketch Map of Decision Tree Algorithm

3.2 Artificial Neural Network

The artificial neural network to simulate the human brain's way of thinking, which has the ability to solve many complic neural network diagram is shown in Figure 6.

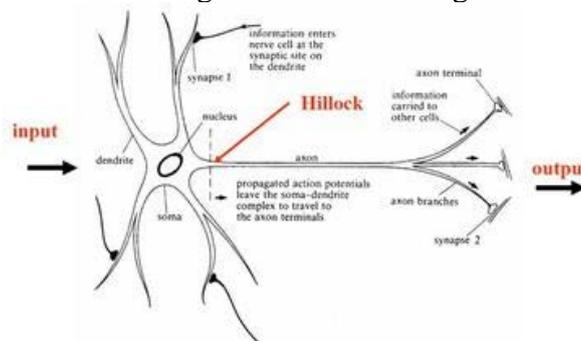


Fig.6 Sketch Map of Artificial Neural Network

4. A Study on the Evaluation of the Technique and Tactics of Table Tennis Match Based on Artificial Intelligence

4.1 The Technique and Tactics of Table Tennis Match Based on Artificial Intelligence

Through the above comparative study on artificial neural network method, decision tree method and rough set method catch from the great period of stalemate, after a stalemate balance score rate

is of decisive significance for the results of the competition.

4.2 The Evaluation Method of Table Tennis Matches Technology and Tactics Based on Artificial Intelligence

Table tennis tactics research mainly focuses on the diagnosis and evaluation of two aspects, mainly through the game of observation and statistics of various technical and tactical characteristics of athletes in the game. The core of the study is to determine the reasonable tactics index system and its weight. The research shows that the technical system and the tactical system can comprehensively describe the technical and tactical level and the strength of the table tennis match in the technical and tactical diagnosis of table tennis match. In this part, the system is still used to evaluate the technical and tactical evaluation of table tennis match.

4.3 Prediction Method of Table Tennis Match Based on Artificial Intelligence

Table tennis game prediction by means of athletes now state analysis and diagnosis, predict the possible future in time prediction method, for example, in the performance change trend of table tennis match, linear time series, game series is not in the strict sense but, if the competition results accumulated over a long period of time, the uniform distribution and the noise is small can be approximately regarded as the linear time series. The modeling process of decision tree neural network is shown in Figure 7.

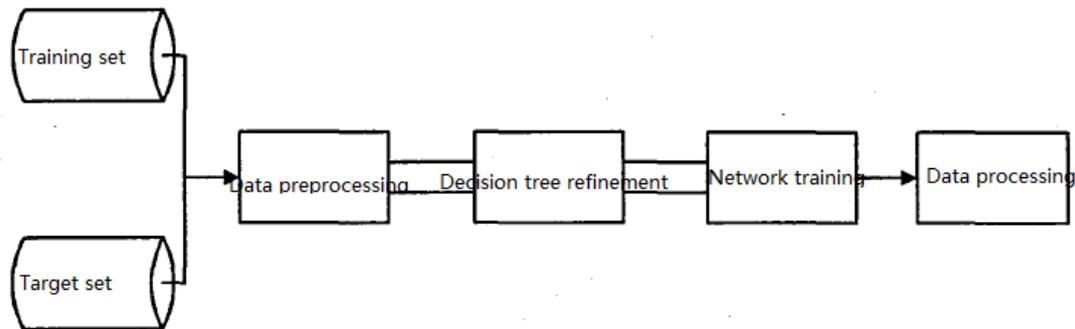


Fig.7 Modeling Process of Decision Tree Neural Network

4.4 Diagnosis Method of Artificial Intelligence Table Tennis Match

In the process of preparing for the competition, to determine the main opponent of the game and to carry out a comprehensive technical and tactical diagnosis of table tennis team in the previous series of key research projects. From the beginning of the first session of the world table tennis championships, Guoping coach group will determine the tactical diagnosis and analysis. Compulsory course for each contest. From the data to form visual tactics documentation for the coaches or athletes business learning and competitor analysis, China table tennis team in the previous preparations for a series of different levels and different types of players technical and tactical diagnostic template has already formed the competition process. Used for diagnostic analysis of technical and tactical spot site and post match.

4.5 Diagnostic Results

Based on the game of artificial intelligence is the main diagnostic method for diagnosis and analysis through technical and tactical data input to rival players technical and tactical characteristics of the overall, the technical ability of the play of the advanced. FORMA is stronger, but look after or attack strong keep weak, full of vigor and vitality in the active without pressure, and can hit the edge, Reiki, quality in the face of pressure, is no way. Diagnostic results are shown in Figure 8.

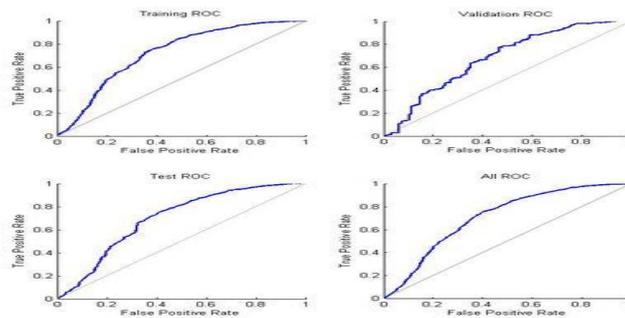


Fig.8 Schematic Diagram of Diagnostic Results

5. Summarize and Expectation

Based on the construction technique and tactics of table tennis match diagnostic evaluation indexes, the methods of artificial intelligence techniques and tactics of table tennis match based on diagnosis method was studied, and based on the prediction of the initial evaluation, the artificial neural network technique and tactics of table tennis match in the diagnosis method based on improved diagnosis results predicted results are clear, the evaluation results close to actual competition, more scientific, technical and tactical game can be conveniently used for diagnosis and decision support. Based on the continuous efforts of sports research workers and sports enthusiasts, the application of artificial intelligence technology in the field of sports is more and more widely. But if all the games have used the artificial intelligence technology, the verdict is fair, it may affect the physical beauty of regret, it is because of the artificial judgment “mistakes”, the sports have more to talk about, has become a hot topic of discussion at leisure. At present, artificial intelligence technology referee from mature and long distance, the development of sports is far behind the artificial intelligence technology in computer science, there are a series of software and hardware, problems, needs of the majority of sports workers to explore.

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