

The Integration and Utilization of Artificial Intelligence in Basketball Sports Competitions

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Abstract

With the rapid development of science and technology, artificial intelligence (AI) technology has been widely applied in various fields. There has been a growing trend to apply AI to basketball competitions and promote the development of basketball competitions through AI technology. This paper combines the nature and characteristics of basketball competitions to illustrate the integration and utilization of AI, aiming to provide a reference for the combination of AI technology in the field of basketball.

Keywords

Basketball
Competitive competition
Artificial intelligence
Integrated utilization

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1. Introduction

The reason behind the popularization of artificial intelligence (AI) is that it belongs to a technology that replicates human intelligence through computer programs. AI can simulate human thought processes for reasoning, judgment, analysis, and so on, exhibiting strong real-time attributes including precision and intelligence. With the continuous advancement of AI technology, its application scope continues to expand, exhibiting positive application outcomes and value. Basketball sports are renowned worldwide. The application of AI technology in basketball competitions possesses great development potential. Under such conditions, the effective integration and utilization of AI technology in basketball competitions

should be widely supported and studied.

2. The significance of the integration and utilization of AI in basketball sports competitions

As an important sports event, basketball competitions possess strong spiritual and cultural attributes and are loved by many. At present, the integration and utilization of AI technology in basketball competitions is still in the initial stages, and the development is far from complete. Nowadays, the role of AI in basketball competitions is only in information collection, sorting, and analysis, but it has not reflected the functionality of its application in the competitions. It is well known that through the

integration and utilization of AI, intelligent algorithms and big data analysis in any field can be achieved. With the integration of AI in basketball competitions, players can provide feedback, promote their strengths, and avoid mistakes on the court to improve their basketball skills ^[1,2]. Furthermore, coaches can analyze the team's data and develop a targeted training plan to practice the skills and tactics that align with the team. This way, the right players can be chosen to participate to increase the team's chances of winning. Through the supervision of AI, referees can accurately make corrections on mistakes that have been overlooked, thus relieving their pressure and ensuring the fairness of the competition. With the help of AI technology, team doctors can monitor the physical condition of players before and after the game, prevent possible injuries, and develop an injury prevention plan. The team doctor can quickly make the right treatment decision in cases of an injury, effectively reduce the treatment cycle, and improve the treatment outcome. AI has also increased the public's understanding of competitive basketball sports games and improved their interest in basketball. In short, the significance of AI integration and utilization for basketball sports competitions is reflected in all aspects, which are time and cost-effective ^[3-6].

3. The specific role of AI integration and utilization in basketball sports competition

3.1. Quality evaluation and skill improvement of players

By using AI technology, the data and information of players in basketball competitions can be obtained in real-time. According to the personalized characteristics of different competition environments, a standardized evaluation system can be established to evaluate the performance and value of players from multiple dimensions. The content of the evaluation mainly includes the basic data of the scoring situation of players, rebounds, assists, steals, and mistakes made on the court. The basic data will then be processed by AI to automatically output the positive and negative efficiency values of players. To understand the changes in the efficiency value of the same player in different periods, a comparison of the efficiency value of different players in the same period

is carried out so that the quality evaluation of the players can be completed in a more diversified way. After that, the quality evaluation results of the players are analyzed and summarized for future improvements. Through AI technology, the movements and physical conditions of the players in the game are recorded and the playing characteristics and styles are analyzed. This way, a more targeted offensive and defensive training plan can be formulated for the players. During training, the players are encouraged to equip ShotTracker kits. Sensors and chips are then used to effectively record the strength, movement rate, and duration of the player's shot. An action and model database is then built with the recorded information to help players adjust their shooting skills, technical movements, and rhythm, to improve their basketball skills ultimately ^[7-11].

3.2. Analysis and formulation of team skills and tactics

Individual ability plays a limited role in basketball competitions as it requires high cooperation between players. As there are 5 players on the court cooperating to initiate the attack and defense, the team's skills and tactics are crucial. Each player's position, passing and receiving mode, movement rate, etc., will affect the competition's final results. With the help of AI technology, coaches can freely switch between different techniques and tactics and carry out optimization to ensure that the choice of techniques and tactics can fully utilize the player's ability. With this, the team can execute higher attack and defense techniques with enhanced efficiency. Through the movement trajectory analysis of the players under different techniques and tactics, the right players can be selected to verify the effectiveness of the techniques and tactics. Timely adjustments can be made to discover and fully utilize the skills and tactics that align with the player's ability. In addition to the analysis of the team players, the movement track of the opponent players can also be analyzed. This can help discover opportunities for breakthroughs during attack and defense as a reference for the further development of skills and tactics ^[12].

3.3. Correction of the referee's decision

In most sports competitions, referees are responsible for maintaining the order of the game and ensuring fair

play. The referee's proficiency and the interference of environmental factors on and off the field will affect the accuracy of the decision made. Even with these factors aside, certain movements that occur on the court may challenge the fairness and accuracy of the decisions made through observation with the naked eye. AI technology solves this by monitoring the game in real time and displaying the ongoing situation on the field. Automatic sensing technology can also be applied in the designated area to automatically identify any foul action. This reduces the probability of the players questioning game decisions and the conflict on the court and enhances the public recognition of the result made from the referee's decision. AI, as the auxiliary of referees, has realized the oversight of the whole competition and still has considerable room for further application and development.

3.4. Providing real-time online services

The role of AI in basketball competitions can not only be used in the data analysis of the game itself, tactical formulation, and referee decisions but also promote the development of basketball-related industries.

For example, AI technology is used to analyze the needs and preferences of the public for basketball competitions and establish an AI service system. This system can relay various information in real-time, answer questions, and predict the results of the competition according to the needs of the public. Users can raise queries about the content they want to know through the

AI service system. Real-time online service provides strong support for the development of basketball competitions. The AI service system should be matched with the automatic inspection mechanism to regularly check the system's status. Any problems should be repaired promptly to ensure the normal 24-hour working state of the AI service system. Nonetheless, it is crucial to establish specific rules and authority according to the identity and needs of the users when assessing the system to ensure that it does not violate the laws and regulations of China^[13,14].

3. Conclusion

The integration and utilization of AI in basketball competitions have a strong impetus to its development. AI technology can better realize the functions of player quality evaluation and skill improvement, analysis and formulation of team skills and tactics, correction of referee decisions, and providing real-time online services. This can effectively help players improve their basketball skills, help coaches to reasonably assign player roles, promote the fairness of the competition, and provide a platform for the public who love basketball to further meet their own needs. Therefore, the relevant departments should pay attention to the application of AI technology in competitive basketball games, realize the authenticity and quality of such games, and promote the development of the basketball industry.

Disclosure statement

The author declares no conflict of interest.

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