Significance of Artificial Intelligence in Sports

Shivesh Shukla
Director of Physical Education & Sports Narsee Monjee College of Commerce & Economics Mumbai, India

Abstract

The purpose of the study was to see the significance of artificial intelligence in sports. Sports excite people as a triumph of human effort. Behind the scenes there are a number of things that go into that triumph, and at the top is technology. The sports world today is getting tech savvy by combining natural, athletic talent with advanced analytics and even artificial intelligence (AI) to produce the best possible outcomes on the playing field. In the sports industry, artificial intelligence seeks to evolve technology in hopes to bring automation and increased data analysis to business decisions, sponsorship activations, ticket sales, athlete training and more. Artificial Intelligence in sport is here to help both coaches and athletes to enhance physic and psychologic performance. With the rapid advances of artificial intelligence (AI) in perception, machines are able to watch and analyze games at a fine-grained level that is virtually impossible for humans to record and process. Hence, the presented approach would allow professionals but also their coaches to analyze in detail the athletes' executions and improve their performances by looking in real time at the measured force and displacement time series or also calculated acceleration, velocity and power properties. Consequently, the possibility of immediate control and comparison of the results could lead to a considerable training enhancement for elite sportsmen.

KEYWORDS- Artificial Intelligence, Sports, Technology, Athlete Training & Performance Analysis.

Introduction

Sports excite people as a triumph of human effort. Behind the scenes there are a number of things that go into that triumph, and at the top is technology. The sports world today is getting tech savvy by combining natural, athletic talent with advanced analytics and even artificial intelligence (AI) to produce the best possible outcomes on the playing field. Everything from reviewing player performance, improving areas of weakness to even predicting optimum actions for future players is being tapped into.Artificial Intelligence (AI) refers to the computer science capability that allows technology to imitate intelligent human behavior such as speech recognition, translating languages, interacting with the physical world through visual analysis and decision making.

In the sports industry, artificial intelligence seeks to evolve technology in hopes to bring automation and increased data analysis to business decisions, sponsorship activations, ticket sales, athlete training and more.Grabyo has teamed up with Opta Sports to publish automated real-time video clips to fans at specific events using AI. GivemeSport utilizes a similar concept, however they publish their sports moments to

Facebook to appeal to their mass following. NASCAR is changing the game by adopting a new way to streamline the officiating process, which uses technology and cameras to identify racing infractions. Lumo Bodytech and Puma have formed a connection to create a cutting-edge AI product that uses real-time data to analyze human biomechanics. NBA summer league has debuted the Aspire Ventures product, Connexion kiosk, to be the "IPhone of health care." The Connexion kiosk will use its artificial intelligence software to analyze player's health data to allow teams to stay informed of any injuries or setbacks. Arccos Caddie is golf's first AI powered-platform that allows players to walk the course with their own virtual caddie which will assist players on what club to use, what direction to hit into, and more based on weather, course location, and player ability. Fitness fans will see AI incorporated with their workouts and nutrition's with an automated workout "buddy," which will support users during their workouts with expertise and encouragement through the app Talk Human to Me. And the list goes on.

The sport industry has felt the initial impact of artificial intelligence through the various aforementioned concepts focused on increased efficiency and engagement. Look for artificial intelligence to continue to play an increasingly important role in the business of sports as its capabilities continue to be refined and advanced.

The evolution of technology in sports to date has been rapid and there is no doubt that the future of sports and technology will continue to evolve. As the integration of sports analytics and technology continues, coaches and teams need to be aware and receptive to adopting new practices to stay ahead of the game or risk losing on multiple levels. Technology will have a far greater impact than ever before, the exciting part will be to see to what extent technology will drive human actions and performance.

Artificial Intelligence in Sports

Artificial intelligence in sports may have been rare just five years ago – but now AI and machine vision are making their way into a number of sports industry applications, from chatbots to computer vision and beyond.Artificial Intelligence in sport is here to help both coaches and athletes to enhance physic and psychologic performance. This is happening both at individual and team level. Availability of data made this possible. Human memory is programmed to remember the substance and meaning of events, not the details. Machines can record and analyze infinite details at speed light. Cameras, videos and sensors applied to body and equipment can collect a quantity of information much higher than a coach and any assistant can do. And can make sense of all those data, through pattern recognition. In real time. Analysis can help to improve performance and make strategy and playing tactics more effective. This leads to better results. But a scientific approach to training, playing and managing injuries can also help athletes to increase their longevity on the field. Both items have a clear link with profitability.

Practical concepts for the realization of AI-based methodologies for sport science disciplines like biomechanics or kinesiology have been already discussed and reviewed earlier (e.g. Lapham and Bartlett, 1995; Bartlett, 2006). A commonly used technique involves the development of methods on the basis of AI for the assessment of different sport-related data measurements or game analysis. The so-called TESSY (tennis simulation system) framework, for instance, is one of the first knowledge-based decision-

making implementations, aiming at the supervision, processing and interpretation of results and tactical behavior as well as the subsequent transformation of conclusions into tennis practice (Lames et al., 1990). Other, more recent, approaches also suggest the implementation of expert systems integrating fuzzy logic procedures for diverse purposes like the evaluation of the fast bowling technique in cricket (Bartlett, 2006; Curtis, 2010) or for the identification of sport talents (Papic et al., 2009). Ratiu et al., 2010 provide an overview on the overall application of AI in sports biomechanics, giving examples of diagnostic tools for the evaluation of movements in different sports.

Artificial Intelligence Applications across Major Sports

- **Chatbots for Sports/ Sports Teams-** The chatbot operates through the Facebook Messenger platform for the purpose of answering fan inquiries including info about franchise history, current team stats, and the team roster.
- **Computer Vision Applications in Sports-** It basically gained proficiency in race cars because it reportedly provide more accurate results than humans in its ability to quickly identify and access a car that is experiencing a malfunction during a race is significant.
- **Automated Sports Journalism-** AI is ushering a new era of sports journalism through automation. In North Carolina, Associated Press is working with Automated Insights for broad media coverage. It basically work on platform that translates hard data into narratives, using natural language.
- **Wearable AI Tech-** These tech devises is capable of tracking and analyzing "microscopic variations of sports movements" to help maximize the efficiency of workouts and training.

Potential Future Applications

- **AI Assistant Coaches-** Researcher is using videos of games and deep learning to train computers. Computers could possibly provide coaches and teams with improved accuracy in analyzing common mistakes and improving plays at a faster rate than human.
- **Smart Ticketing-** Smart ticketing is a technology that allows ticket buyers to change seats, from game to game, based on their backgrounds and interest.
- **Computer Vision Referee-** Bay Area has designed a pocket size device that called "Tennis In/Out", which uses computer vision to detect the speed and placement of a tennis shot.
- **Wearable and health data**: Integration of wearable in sports being limited to practice sessions. Teams like the Golden State Warriors have introduced the technology as a way to prevent fatigue and injury. However, it's likely to be a long road before we see wearable deeply integrated into real-time game play. Discussions around the privacy when it comes to a player's personal medical information comes into question as well as the ability to obtain necessary approvals from player unions, league owners and sports organizations.

- **Connected Smart Equipment**: From baseball bats to tennis racquets to golf clubs, smart sports equipment has entered the arena. For instance, smart bat company, Zepp, utilizes a sensor that is attached to the bottom of the bat and collects real-time data allowing baseball players to analyze swings and visualize the data directly from a smartphone. The immediacy of this information allows players and coaches to take an extremely detailed look at every action taken and identify any areas for improvement.

Conclusion

With the rapid advances of artificial intelligence (AI)in perception, machines are able to watch and analyzegames at a fine-grained level that is virtually impossiblefor humans to record and process. Machines can nowtrack players and calculate useful metrics without theneed for laborious human labeling. They can even estimatethe effectiveness of every pass along multiple dimensions,such as the risk-to-potential reward ratioassociated with a pass, the ‘‘pressure’’ being appliedby the opposing team before the pass, and so on. Themachine is also able to infer things, like the intent ofeach pass, automatically by analyzing the positionsand velocities of all players on the field. It can also automaticallylabel such passes as ‘‘completed,’’ ‘‘intercepted,’’‘‘scored,’’ etc.In short, we are on the verge of a great leap forwardin automated feature engineering in sports, from wherestrategic and tactical insights using supervised machinelearning methods are just a step away. AI impacting nearly every major professional sports. This is timely disruption of the industry as media involvement become increasingly important as the leading source of revenue in professional sports. It is clear from the direction of this trend that fans are demanding more access to their favorite sports team and technology is a necessary conduit to meeting this demand. AI is providing customized frameworks for fans to feel closer than ever to the players and the game. In this respect, artificial intelligence in sport won’t be much different than its applications in media and software generally. It is important to note that most of the applications of AI in sports are still in a test or pilot phase, and it may be another three or four years before stadium chatbots and wearable's become commonplace and clearly advantageous in the sporting endeavor.

Discussion

Nowadays, due to the progress of information and communication technologies including simplified and convenient implementations of wireless sensor networks for data acquisition and mobile devices for processing purposes, the integration of intelligent methods becomes increasingly important for the automatic analysis of measured parameters and the realization of prompt intervention routines.AI concepts appear to be particularly suitable for the design of effective evaluation and feedback frameworks in sport. After the initial boom in the 1970s and 1980s, the use of AI techniques is meanwhile limited to rather specific application fields including also sport, as their application gets essential for the assessment of sports data. Practically, the quality of the movement plays a significant role, as it contributes to the efficiency and value of the workout. Therefore, a particular focus of the illustrated approach was to provide automatic analysis on the technique as well as appropriate interventions and suggestions.

The development and integration of such models and routines thus might enable new facilities for the support of sportsmen and injury prevention.

Sportsmen can improve their technique on the basis of the automated evaluation routines and the return of instant notifications regarding occurred mistakes, by receiving appropriate corrective advices and improvement suggestions. Based on this feedback information also the risk of injuries can be reduced, which is another big future objective of the approach.Well-trained athletes need to optimize their training to their sport-specific requirements and to improve their functional ability more specifically. In order to achieve the desired adaptations it is therefore advisable to choose exercises that specifically meet the force-velocity needs of the sport. Hence, immediate control and comparison of the results could lead to a considerable training enhancement the presented approach would allow professionals but also their coaches to analyze in detail the athletes' executions and improve their performances by looking in real time at the measured force and displacement time series or also calculated acceleration, velocity and power properties. Consequently, the possibility of for elite sportsmen.

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