

ARTIFICIAL INTELLIGENCE IN SPORTS SCIENCE - A BIBLIOMETRIC ANALYSIS

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Abstract

Artificial intelligence start role the sports industry. This study focusto conduct the bibliometric analysis in sports science area. To achieve the purpure data were collected from the Web of Science data base. By using the Mesh term found 74740 articles found in the artificial intelligence. Based on the inclusion and exclusion criteria 23 articles finalized for analysis in the area of sports science. By using RStudio bibloshiny analysis we found very few studies were found in the areas of Artificial intelligence in sports science. It is recommended to more research need to conduct in future for improving sports performance with the help of artificial intelligence.

Keywords: Artificial intelligence, Sports Science, Bibliometric analysis.

Introduction

As a discipline created in the 1950s, artificial intelligence (AI) is defined as the ability of a system to interpret and learn from exterior data correctly and to adopt the learning results to achieve specific objectives and solve problems through flexible adaptation (Wei et al., 2021;Kaplan &Haenlein, 2019).In general, artificial intelligence (AI) is derived from imitating human actions and abilities such as thinking and learning. It involves the idea of designing so-called intelligent agents or machines that are similarly able to acquire, simulate and employ knowledge, analytical capabilities and professional skills for the overall purpose of problem solving (Poole et al1998; Novatchkov& Baca2013).

Artificial Intelligence concept is altering sports positively and hoisting it to an unheardof level of success. While the facts confirm that measurements and quantitative investigation have assumed a focal job in sports for quite a while, A.I. is essentially affecting how games are planned, played, and drawing in the crowd. We see this pattern overrunning across baseball, tennis, soccer, football and numerous others. Artificial intelligence has entered the storage space conversations with better bits of knowledge about the

opposition, the mentor's recommendation with better patterns, and your T.V. screens with quicker features (Nadikattu, 2020). That is not all. Simulated intelligence is clearing a more creative way to triumph in sports for everybody from sportspersons to telecasters, with constant game insights for players and fans, game strategies forecast to empower the player to pick the correct procedure and even alarm the player if there should arise an occurrence of a potential decrease in execution or injury. Innovation has gotten unavoidable in sports and a key supporter of its development both inside the arena and outside, empowering every player and group to be simply the best. Mentors and players are searching for more profound bits of knowledge to take their game to the following level, umpires/officials expect help to make the privilege choices in minutes that issue, and the fans are requesting more customized encounters and more prominent availability. Artificial intelligence gives a road to address every one of these requests. Computerbased intelligence advancements are developing quickly and becoming progressively essential for a donning association's capacity to dominate matches, improve mentors and players, deal with their tasks, and grow, serve, and hold their fans. The basic exists for donning groups not to simply receive a particular A.I. innovation but instead to approach a munitions stockpile of A.I. advancements that will improve their capacity to produce and follow up on essential bits of knowledge whether it's fan commitment, ability distinguishing proof, pre-game planning or constant in-game assistance. A.I. has enhanced accuracy in sports since scores, player movements, and fan habits can be easily predictable through Artificial Intelligence(Porwal, 2020). The objectives of the study was

1. To identify the year wise scientific production details.
2. To identify the source wise scientific productions.

Methodology

Database

In this bibliometric analysis study, the data were collected from the Web of Science (WoS) Core collection data base.

Searching Strategy

For collection of data from the database the following Mesh Term were used such as “Artificial Intelligence”, “Artificial Intelligence in Sports”, “Artificial Intelligences”, “AI”, and “AI in Sports”.

Inclusion and Exclusion Criteria

The following criteria were selected as inclusion criteria for gathering the data from the database such as

- English Language – the articles published in English language only consider for this analysis.
- Sports Science Citation Topic Meso - the articles published in sports science field only consider for this analysis.
- Sports Science in WoS Categories– the articles published in sports science field only consider for this analysis.

The following criteria were selected as Exclusion criteria for gathering the data from the database such as

- Other than English languages are excluded from this analysis.
- Other than Sports Science field published articles are excluded from this analysis.

Analysis of Data

Searching with the Mesh Term 74740 data were found in the WoS core collection. After refining the inclusion and exclusion criteria found 90 articles were found sports related data from the data base. Further found 23 articles exclusively in Sports Science filed of research. The selected 23 articles export into the plain text format for further analysis with R studio application.

Results

90 articles found from the different filed of research related to sports such as Sports Science – 23, Engineering Electrical Electronic 12, Instruments Instrumentation - 11, Chemistry Analytical – 10, Computer Science Artificial Intelligence - 7, Computer Science Information Systems - 7, Telecommunications - 7, Multidisciplinary Sciences – 6, Engineering Multidisciplinary – 5, Engineering Multidisciplinary – 5, Mathematical Computational Biology – 4, Biotechnology Applied Microbiology - 3, Chemistry Multidisciplinary - 3, Engineering Mechanical – 3, Environmental Sciences – 3, Food Science Technology - 3, Hospitality Leisure Sport Tourism - 3, Materials Science Multidisciplinary – 3, Neurosciences – 3, Physics Applied – 3, Psychology Applied - 3, Psychology Multidisciplinary - 3, Public Environmental Occupational Health - 3, Health Care Sciences Services – 2, Physiology - 2, Surgery - 2, Biochemistry Molecular Biology - 1, Clinical Neurology - 1, Computer Science Cybernetics – 1, Computer Science Interdisciplinary Applications – 1, Computer Science Theory Methods – 1, Critical Care Medicine – 1, Emergency Medicine – 1, Engineering Civil – 1, Engineering Environmental – 1, Ergonomics – 1, Geosciences Multidisciplinary – 1, Geriatrics Gerontology – 1, Management – 1, Materials Science Characterization Testing - 1, Materials Science Characterization Testing – 1, Mathematics Applied – 1, Mathematics Interdisciplinary Applications – 1, Medical Informatics – 1, Medicine General Internal – 1, Medicine Research Experimental -1, Microscopy – 1, Operations Research Management Science - 1, Orthopedics – 1, Pharmacology Pharmacy - 1 , Psychology – 1, Rehabilitation –1 respectively.

After met with the inclusion and exclusion criteria 23 articles used for the bibliometric analysis in R Studio Biblioshiny. The selected 23 articles are published in the timespan from 2006 to 2022 according to 18th February 2023. These 23 articles are from 13 different sources with annual Growth Rate of 7.11 %. In these 23 articles 101 authors are involved in the area of artificial intelligence in sports science. 2 of the authors have published with single authored. 95 keywords are appeared in these 23 articles. In these 23 documents 21 documents are from articles, 02 documents from review papers. Table 1 shows the 21 articles published year wise details.

Table 1 Year wise publication details (Article)

Year	No. of Article Published
2006	1
2007	0
2008	0
2009	0
2010	0
2011	0
2012	0
2013	2
2014	0
2015	0
2016	0
2017	2
2018	1
2019	3
2020	3
2021	6
2022	3

Table 2 represent the Source Scientific Production Over Time.

Year	JOURNAL OF SPORTS SCIENCES	INTERNATIONAL JOURNAL OF PERFORMANCE ANALYSIS IN SPORT	JOURNAL OF SCIENCE AND MEDICINE IN SPORT	EUROPEAN JOURNAL OF SPORT SCIENCE	JOURNAL OF SPORTS SCIENCE AND MEDICINE	INTERNATIONAL JOURNAL OF SPORTS PHYSIOLOGY AND PERFORMANCE	JOURNAL OF STRENGTH AND CONDITIONING RESEARCH	KINESIOLOGY	PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART P-JOURNAL OF SPORTS ENGINEERING AND TECHNOLOGY	RESEARCH IN SPORTS MEDICINE	SPORTS MEDICINE-OPEN
2006	0	0	0	0	1	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0
2013	0	1	0	0	1	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0
2017	0	1	0	0	0	0	0	0	1	0	0
2018	0	1	0	0	0	0	0	0	0	0	0

2019	0	0	0	1	0	0	0	1	0	0	1
2020	2	0	1	0	0	0	0	0	0	0	0
2021	2	0	1	0	0	1	1	0	0	1	0
2022	1	0	1	1	0	0	0	0	0	0	0
Total Article	5	3	3	2	2	1	1	1	1	1	1

From the table 2 the Journal of sports sciences has more publication in past decade, however International journal of performance analysis in sport has 3 publication from 2006 to 2022.

Conclusion.

From this bibliometric analysis came to know that very few studies only conducted in the field of AI in sports science. We recommend to conduct more research with AI in sports science because it helps to AI Referee, Personalized training and diet plans, human pose estimation, Player performance with motion detection, Scouting and recruitment the players especially Machine Learning algorithms use aggregated data to “evaluate players’ skills and overall potential and rank them in various categories, Match predictions etc.

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