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In Sports Science, Perform a Bibliometric Analysis on Artificial Intelligence

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Abstract
The sports business is starting to use artificial intelligence. The goal of this study is to perform bibliometric analysis in the field of sports science. Data were gathered from the Web of Science data base in order to get the desired result. Using the Mesh keyword, 74740 articles about artificial intelligence were discovered. 23 papers have been chosen for study in the field of sports science based on the inclusion and exclusion criteria. We discovered extremely few studies in the fields of artificial intelligence and sports science utilising R Studio bibloshiny analysis. It is advised that further study be conducted in the future to enhance sports performance using artificial intelligence.
Keywords: Artificial Intelligence, Sports Science, Bibliometric Analysis.

Introduction

Artificial intelligence (AI), a field of study founded in the 1950s, is defined as a system's capacity to accurately interpret and learn from external data as well as to adopt the learning outcomes to achieve particular goals and solve problems through flexible adaptation (Wei et al.; Kaplan and Haenlein). Artificial intelligence (AI) is typically created by mimicking human behaviours and skills, like thinking and learning. According to (Poole et al.; Novatchkov and Baca), it entails the idea of creating "intelligent agents" or "machines" that are equally capable of learning, simulating, and using knowledge, analytical skills, and professional expertise towards the overall goal of problem solving.

Sports are changing for the better and reaching previously unheard-of heights of success thanks to the concept of artificial intelligence. The data show that measurements and quantitative research have been important in sports for a long, but A.I. is really changing how matches are organised, played, and how many spectators they attract. Baseball, tennis, soccer, football, and many other sports all exhibit this pattern. Artificial intelligence has made its way onto TV displays with quicker features, mentor recommendations with better patterns, and storage space talks with better bits of information about the opposition (Nadikattu). Not only that. With constant game insights for players and fans, game strategies forecast to enable the player to choose the correct procedure, and even alarming the player if there should arise an occurrence of a potential decrease in execution or injury, artificial intelligence is paving the way for a more inventive way for everyone in sports, from athletes to telecasters.

Sports innovation has become inescapable and a crucial component of the industry's growth both inside and beyond the arena, enabling every player and team to perform at their absolute best. Umpires/ officials expect assistance to make the Computer-based intelligence breakthroughs are advancing swiftly and are more necessary for a sporting association's capacity to win matches, develop coaches and players, manage their tasks, and expand, service, and retain their fan base. The fundamental exists for outfitting teams to approach a munitions stockpile of AI innovations that will enhance their capacity to produce and follow up on crucial pieces of knowledge, whether it's fan commitment, ability distinguishing proof, pre-game planning, or constant in-game assistance. Since scores, player actions, and audience behaviour can be easily predicted using artificial intelligence, A.I. has improved accuracy in sports (Porwal). The study's goals were to identify the year wise scientific production details.

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 - For this analysis, only articles published in the English language are taken into account.
- Sports Science Citation Topic Meso - This analysis only takes into account papers that were published in the discipline of sports science.
- Sports Science in WoS Categories: For this analysis, only articles published in the sports science sector were taken into account.

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

The WoS core collection included 74740 data after a search with the mesh term. Following the refinement of the inclusion and exclusion criteria, 90 articles containing sports-related information were discovered in the database. I also discovered 23 publications that were solely in the research field of sports science. The 23 articles that were chosen are exported into plain text format for additional R studio processing.

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.

23 articles were chosen for the bibliometric analysis in R Studio Biblioshiny once they met the inclusion and exclusion criteria. The 23 articles that were chosen were published between the years of 2006 and 2022, as of February 18, 2023. These 23 articles have an annual Growth Rate of 7.11% and come from 13 different sources. 101 authors from the field of artificial intelligence in sports science are represented in these 23 articles. Two of the authors have written books alone. In these 23 articles, 95 keywords are used. 21 of the 23 documents in this collection are from articles, while 2 are from review papers. Table 1 lists the 21 articles that were published, organised by year.

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

This bibliometric study revealed that a small number of studies were solely undertaken in the area of artificial intelligence in sports science. More research on AI in sports science is encouraged because it benefits AI Referee. In order to "evaluate players' skills and overall potential and rank them in various categories, Match predictions, Player performance with motion detection, Personalised training and diet plans, Human pose estimation, Machine Learning algorithms, Scouting and recruitment the players, etc., use aggregated data.

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