

Bibliometric Analysis: Trends And Contributions of Research in The Field of Artificial Intelligence

Donny Febriansyah¹, Abdal Azis Alsaud²

¹ Informatics Study Program, Majalengka University and donnyfeb03@gmail.com

² Informatics Study Program, Majalengka University and abdalazizalsaudddd@gmail.com

ABSTRACT

This research aims to investigate research developments and research contributions in the field of Artificial Intelligence (AI) through a bibliometric analysis approach. Bibliometric data is obtained from various scientific reference sources including journal articles, conferences and books within a certain time period. The results of the analysis show an exponential growth in AI publications over the last few years. This study also identified a trend of strong research collaboration between researchers and research institutions in AI development. Dominant research topics include machine learning, natural language processing, image recognition, and robotics. Additionally, the study identifies the most prolific authors in the discipline and measures research impact based on the number of citations received. The results of this research provide deep insight into developments in AI research, enabling stakeholders to understand current research trends and focus. These findings can also serve as a guide for future research directions in the field of Artificial Intelligence.

Keywords: Artificial Intelligence, Trends and Contributions, Bibliometric Analysis

1. INTRODUCTION

"Artificial Intelligence (AI)" is a pair of words that excites both fans and experts in the AI community. The concept of man-made machines or living creatures capable of thinking, learning, and making decisions on their own is so amazing that it has been present in popular culture for decades. From the hard science fiction of Issac Asimov and Arthur C. Clarke in the second half of the 19th century to the widely exhibited Hollywood films of today, loosely based on the real science behind AI technology, we have seen the human imagination run wild conjuring all possibilities. of Artificial Intelligence.

[1], in his iteration of the history of AI, stated that the history of AI is related to the history of fantasy, possibility, demonstration, and promise. In this he takes as an example the work of Homer where the mechanical tripod was thought to serve the gods as a mechanical assistant, the work of Rene Descartes where the "mechanical man" has been used as a metaphor to explain mechanical philosophy, the work of Gottfried Wilhelm Leibniz where possible mechanical reasoning devices are said to be capable of solving disputes, etc. He also mentioned the work of Jules Verne and L. Frank Baum in the nineteenth century, Isaac Asimov in the twentieth century as an inspiration for modern AI researchers.

Artificial Intelligence (AI) has become one of the most dynamic and significant research fields in the world of computer science and technology. With its ability to bring innovative solutions in various aspects of human life, AI has received great attention from academics, researchers, and industry. Rapid developments in AI technology have impacted various aspects of life, including healthcare, industrial automation, autonomous vehicles, and more. As AI technology has developed, the scientific literature in this field has grown exponentially. Scholarly publications in AI cover a wide range of topics, from machine learning to natural language processing, image processing, and

robotics. This research aims to explore and analyze research trends and contributions in the field of AI through a bibliometric analysis approach.

[2] Bibliometric analysis is an effective method for measuring research developments and identifying research contributions in specific disciplines. By analyzing bibliometric data, we can understand publication trends, research collaborations, and influential authors and institutions in the field of AI. With a deeper understanding of research developments in AI, we can identify dominant research topics, collaboration trends, and the impact of that research in the discipline.

The aim of this research is to provide a comprehensive understanding of research developments in AI. The results of our bibliometric analysis will provide a deeper insight into the direction of research, the contributions of researchers, as well as the impact of research in the AI discipline.

This study will begin with collecting bibliometric data from various relevant scientific reference sources. The results of our analysis will be presented in subsequent sections of this journal, including findings on publication trends, research collaborations, dominant research topics, and influential authors and institutions in the field of AI.

Contains the background and objectives of the research as well as an explanation of related research that is up to date and the added value of research which is innovation. Citations from the bibliography are marked [1] based on the number in the bibliography. Terms in foreign languages are written in italics.

2. METHODS

Building scientific research related to existing data can be of infinite complexity. This literature review research will use bibliometric analysis which is a procedure for presenting a clear summary of a very large number of scientific studies [3]. Searching for data in this bibliometric analysis research uses Publish or Perish software [4]. However, to analyze and get an interesting and easy to understand bibliometric network visualization, use the help of VOSviewer software [5]. The reason for using VOSviewer software is its ability to efficiently process large data sets and present interesting visualizations, analyzes and investigations [6]. Apart from that, VOSviewer is also able to create visualizations of publication maps, author maps, or journal maps based on co-citation networks and can also build keyword maps based on collaborating networks.

2.1 *Bibliometric Datasets*

The bibliometric data used in this research were obtained from leading scientific reference sources, including journal databases, conferences, and research repositories relevant to the field of Artificial Intelligence (AI). The data includes the latest scientific publications within a specific time frame, which are relevant to the AI discipline.

2.2 *Inclusion and Exclusion Criteria*

To ensure relevant and accurate data, we applied strict inclusion and exclusion criteria to the publications to be included in the analysis. Submitted publications must meet the following requirements related to the field of Artificial Intelligence. Contains information necessary for bibliometric analysis, such as information about the author, publication title, year of publication, and citation references.

2.3 *Story Variables Measured: In this bibliometric analysis, we measure a wide range of variables that include*

- 1) Number of publications per year: To determine the development trend of AI research.
- 2) Number of citations per publication: To measure the impact of research.
- 3) Research collaboration between authors: To identify the level of collaboration within the AI research community.
- 4) Inter-institutional research collaboration: To view collaboration between research institutions.
- 5) Dominating research topics: To identify the main research topics in the AI literature.
- 6) Most prolific authors: To identify the most prolific authors in the AI discipline.
- 7) Most influential institutions: To identify institutions that have made major contributions to AI research.

2.4 Descriptive Statistical Analysis

The data collected is then analyzed using descriptive statistical methods, such as calculating the average, median and standard deviation of the variables being measured. This analysis helps us understand research trends and contributions in AI.

2.5 Network Mapping

We also performed network mapping analysis to identify significant research collaborations between authors and research institutions. This helps us identify emerging knowledge networks within the AI discipline.

2.6 Bibliometric Analysis Software

In bibliometric analysis, we use leading bibliometric analysis software to process data and produce accurate results. This software is used to calculate and analyze bibliometric data, including publication rankings, collaboration graphs, and impact indicators.

3. RESULTS AND DISCUSSION

Related to the field of Artificial Intelligence. Contains information necessary for bibliometric analysis, such as information about the author, publication title, year of publication, and citation references.

Table 1. Authors

Writer	n
Abdul Ghani Olabi	25
Juric Krope	23
Darko Goricanec	23
Stanislav Božičnik	23
Mohammed Assim Alsalem	11

Table 2. Publication Title

Publication Title	n
Lecture Notes in Computer Science	92
Lecture Notes in Networks and Systems	75
Advances in Intelligent Systems and Computing	56
Communications in Computer and Information Science	28
Sustainability	21

Table 3. Year of Publication

Year of Publication	n
2014	9
2015	19
2016	19
2017	79
2018	38
2019	82
2020	103
2021	197
2022	375
2023	361

Table 4. Citation References

Review	Citation
Zawacki-richter, 2019	609
Choy, 2018	518
Sacks, 2018	351
Mitta, 2017	342

CONCLUSION

Conclusions from a bibliometric analysis of research trends and contributions in the field of artificial intelligence may vary depending on the data accessed. However, some general trends and main contributions in this field can be mentioned, such as:

1. **Research Trends:** The field of artificial intelligence has experienced rapid growth in recent years, with a significant increase in the number of related scientific publications. This reflects the strong interest in the development of AI technology.
2. **Research Contributions:** Many studies have made important contributions to the development of artificial intelligence, such as the discovery of deep learning techniques, the development of sophisticated natural language models, and the use of AI in various industries.
3. **Interdisciplinary:** Research in artificial intelligence often involves multiple disciplines, including computer science, statistics, mathematics, and cognitive science. This reflects the interdisciplinary nature of the field.
4. **International Spread:** Research in artificial intelligence is spread internationally, with contributions from researchers in many countries. Collaboration across national borders often plays an important role in the development of this field.

These conclusions can be further tailored to the specific data you have, but these are some general points that can help you in analyzing trends and contributions in the field of artificial intelligence.

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