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Artificial Intelligence In Machine Learning

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ABSTRACT

One of the most fascinating developments in artificial intelligence in recent years is machine learning. Understanding algorithms for a variety of everyday applications. One of the reasons a learning algorithm one that is employed by Google or Microsoft works so effectively every time an online search engine like Google or Bing is used to search the internet is because it has learnt how to rank web sites. The SCOPUS database and Web of Science were used for the analysis. Moreover, N Vivo 12 and UCINET software were utilised to finish them. In order to show how the field has changed from 1999 to the present, a study of the literature on ML and AI empirical investigations produced in the past century was done. Eighty-two articles underwent classification and evaluation. The first noteworthy outcome is the higher volume of American-published publications and the growing interest following the introduction of Industry 4.0.

Keywords: *Artificial intelligence; machine learning; systematic literature review; applications; Industry 4.0; smart production; sustainability.*

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INTRODUCTION

In order to save costs while improving the quality and sustainability of industrial operations, smart production systems need creative solutions. In this regard, new industrial paradigms can be created by artificial intelligence (AI)-driven technologies that are backed by I4.0 Key Enabling Technologies, such as the Internet of Things, sophisticated embedded systems, cloud computing, big data, cognitive systems, virtual and augmented reality, and more [1]. The various fields of artificial intelligence can be broadly divided into 16 groups [2–3]. These include the following: knowledge representation, machine learning, neural networks, theorem proving, constraint satisfaction, artificial life, belief revision, data mining, distributed AI, expert systems, genetic algorithms, and theory of computation. [4-5].

Physiology and computer science are integrated to create artificial intelligence (AI). Put simply, intelligence is the computational aspect of the capacity to accomplish worldly goals. The capacity to reason, visualize, memorize, comprehend, see patterns, make decisions, adjust to change, and gain experience are all considered components of intelligence. Artificial intelligence, as defined by Poole and Goebel (1998) [6], is the process of teaching computers to behave in a more human-like manner and in a lot less time than a human does. AI has grown in importance as a study topic in the twenty-first century across a wide range of disciplines, including engineering, science, medicine, education, business, accounting, finance, marketing, economics, the stock market, and law [7-8]. They also have an impact on more general global sustainability trends. Critical problems for sustainable manufacturing, such as the optimization of energy resources, logistics, supply chain management, waste management, etc., can be helped by artificial intelligence. In light of these regulations, there is a movement in smart production to integrate artificial intelligence (AI) into environmentally friendly manufacturing procedures [9]. By providing more training data, the aforementioned methodologies' accuracy and precision can be further improved, strengthening their learning capacities and, thus, their automated decision-making efficiencies. [10] As a result, today's IT giants are also interested in subfields of AI, such as machine learning, natural language processing, image processing, and data mining. Because of the ongoing advancement of current technology, artificial intelligence (AI) is a topic that the scientific community is very interested in. ML is currently developing as a subfield of AI quite quickly. Its application has expanded to a number of industries, including smart manufacturing, pharmacology, games, business, archaeology, medical science, and agriculture. One example of this is the employment of learning machines. In light of the aforementioned factors, a thorough literature evaluation of studies on artificial intelligence (AI) and machine learning (ML) conducted from 1999 to 2019 was done for this work. For this reason, in order to have more variation and reflection, it is thought to be necessary to construct a classification system that refers to the articles that jointly discuss the two themes. In addition, in order to obtain a more profound comprehension, the impact of additional factors was investigated, including the sectors and thematic areas where the technologies have the greatest influence. This work's primary contribution is an overview of the research that has been done thus far. For several years,

there has been discussion over various outstanding documentations of well-established research methodologies and ideas. Regretfully, there is a dearth of cross-study integration and comparability. An shared knowledge of AI and ML research and its variants was established in this article. This study does not aim to offer a comprehensive overview of the literature on artificial intelligence and machine learning. Instead, it aims to offer a foundation for combining information from many studies conducted in this field and makes recommendations for other study directions. It investigates research in a few cutting-edge fields, including manufacturing, maintenance, environmental contamination, and medical. In order to expand the current frontier of AI knowledge, more research is required to include the tenets and ideologies of some conventional fields into the frameworks already in place for AI. [11–13]

Methodology

A combination of bibliometric, content analysis, and social network tools were employed in the methodological approach. Modern research was done for this study using the SCOPUS and Web of Science databases. To better understand how the amount of attention to the topic has evolved before and after the advent of Industry 4.0, the publishing time span from 1999 to 2019 was taken into consideration. The systematic literature review research methodology was selected for this study [14].

Cyber-Security

In order to ensure dependable and effective digital services, a smart city is designed to be made up of interconnected sensors, actuators, and relays that are safe, secure, and dependable. These components collect, process, and transmit data. The necessity to address cyber-security concerns has arisen as a result of the interconnectedness of different technologies. [15]

Machine Learning

To put it simply, learning is the process of either gaining new information or improving or modernizing one's existing skills. Acquiring new information involves a variety of activities, including grasping the meanings of important concepts and how they relate to one another and the subject matter. In terms of biology, skill enhancement is the reinforcement of a brain connection pattern that allows one to accomplish a desired function. [16]

Intelligent Transportation System

The future of Intelligent Transportation System (ITS) and the idea of smart cities have been significantly impacted by the integrated application of modern sensors, control systems, and ICT, or ITS, which produces large amounts of data [17]. An essential component of a sustainable intelligent transportation system (ITS) is the accurate monitoring and estimation of real-time traffic flow data in an urban context, which is made possible by AI, ML, and particularly DRL approaches [18, 19].

Top Highly Influential Analysis

The most frequently referenced papers in Web of Science and Scopus are listed in this section. According to the research source, the list is arranged by date, title, authors, source title, and top citation (TP) in Web of Science or Scopus. The Appendix A has the whole list. It is possible to emphasize that the document by Larrañaga, Calvo can be found in Appendix A. [20]

Computer Assisted Instruction Systems

For many years, computer-assisted instruction has been used to leverage the potential of computers in the classroom. Early CAI programmes were mainly copies of pre-existing course materials. For instance, a popular CAI approach mimics a process known as programmed instruction. Students read brief educational information in a programmed instruction text and are subsequently given quick comprehension tests. Depending on how they answered the questions, students switch to different pages in the book, thereby programming a varied path through the subject based on individual comprehension ability. Frame-based CAI is the name of the CAI method that is based on programmed instruction. The quality of the program's design is the only factor that determines the frame-based CAI's effectiveness. Frame-based CAI programmes, notwithstanding the numerous successful ones that have been created, use computers just as electronic page turners. Choosing book sellers or other vendors of library materials is a clear potential use case for ES in libraries. To that end, a system could be created to automatically choose a vendor based on their track record of supplying publications of a specific kind. This kind of capability would be especially helpful when acquiring less common materials, like conference proceedings. [21]

Conclusion

This study chose literature on what is currently a particularly popular issue in scientific research, with an emphasis on the state-of-the-art of AI and ML applications. For better user experience and its implementation in libraries and information centres, it is imperative to comprehend the benefits and drawbacks of artificial intelligence and machine learning.

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