

# Current Research Status of Genetic Algorithm Research in China's Library Sector

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**Abstract.** As an advanced technology of Data Mining, Genetic Algorithm provides an important method for deeply excavating library's collection resources and personalized interactive learning services. The paper adopts the method of bibliometrics to statistics, combing and analysis of the current research status of Genetic Algorithm research in China's Library Sector, finds the characteristics of Genetic Algorithm research in China's Library Sector, and proposes the research trends of Genetic Algorithm research in China's Library Sector in the future for promoting in-depth research and practice in the field of Genetic Algorithm research in China's Library Sector, and improves the utilization rate of library's collection resources and service effectiveness.

## 1. Introduction

As an advanced technology of Data Mining, Genetic Algorithm[1-2] provides an important method for deeply excavating potentially valuable information contained in massive library's collection resources, improves the utilization rate of library's collection resources and service effectiveness for meeting the readers' needs of personalized interactive learning services[3-4]. Experts and scholars in related fields of Genetic Algorithm research in China's Library Sector have deeply discussed in theoretical research and practical application, and have achieved a lot of academic research results and practical experience related to the research on genetic algorithm in library field. However, with the deeply discussed and applied in theoretical research and practical application related to the research on Genetic Algorithm research in China's Library Sector, more and more academic achievements are constantly being produced.

So, it is necessary to statistics, combing and analysis of the current research status of Genetic Algorithm research in China's Library Sector for avoiding repeated investment in the follow-up research related to the research on Genetic Algorithm research in China's Library Sector, and providing very valuable analysis of current status and resources support for the follow-up research related to the research on Genetic Algorithm research in China's Library Sector, accelerating the output of more high-quality academic achievements related to the research on Genetic Algorithm research in China's Library Sector, promoting the in-depth application of Genetic Algorithm in the field of China's

Library Sector, and further improving the utilization rate of library's collection resources and service effectiveness.

## 2. Research Methods and Data Sources

The paper mainly uses bibliometrics, statistics and other related methods and theories to statistics, combing and analysis of the current research status of Genetic Algorithm research in China's Library Sector through the analysis of the year analysis, research institution, published journal, research hotspots, and academic dissemination degree for exposing the research overview, and providing very valuable analysis of current status and resources support for the follow-up research related to the research on Genetic Algorithm research in China's Library Sector.

In order to retrieve almost all the academic papers related to the research and application of Genetic Algorithm research in China's Library Sector, this paper takes CNKI as the sample database. Then, this paper used the search formula ( TI = ' library ' \* ' genetic algorithm ' ) OR ( KY = ' library ' \* ' genetic algorithm ' ) OR ( TI = ' library ' and KY = ' genetic algorithm ' ) OR ( TI = ' genetic algorithm ' and KY = ' library ' ) to retrieve the related academic papers. The search time is May 23, 2023. The deadline for the publication of academic papers is 2022. And last, a total of 24 related academic papers of Genetic Algorithm research in China's Library Sector were obtained after processing.

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### 3. Current Research Status

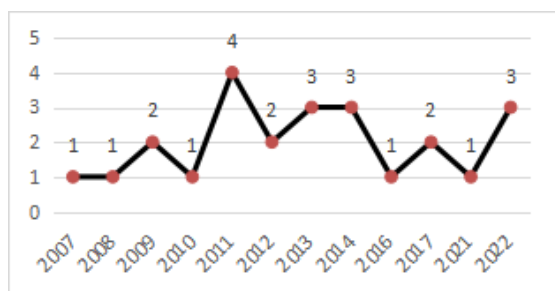
#### 3.1 Year Analysis

Year analysis is based on the annual number of papers published in the field of Genetic Algorithm research in China's Library Sector for revealing the research scale and development context of Genetic Algorithm research in China's Library Sector in present[5], Fig. 1 and Table 1 are the annual distribution table of and the annual trend chart of Genetic Algorithm Research in China's Library Sector.

Fig. 1 and Table 1 show:(1) The first academic research paper of Genetic Algorithm research in China's Library Sector is published in 2007. This paper first introduced the connotation of Genetic Algorithm, and then introduced the benefits of Genetic Algorithm in the filed of library reader data mining and decision-making[6];(2) The average annual number of papers published in the field of Genetic Algorithm research in China's Library Sector was 1.5, and the average annual number of papers published greater than 1.5 includes 2009,2011,2012,2013,2014,2017 and 2022. In addition, the largest average annual number of paper was in 2011;(3)The number of academic papers in the field of Genetic Algorithm research in China's Library Sector is not large. Therefore, the research practice of Genetic Algorithm research in China's Library Sector should be further strengthened in the future.

**Table 1.** The annual distribution table of Genetic Algorithm research in China's Library Sector

No.	Year	Number of Papers published
1	2007	1
2	2008	1
3	2009	2
4	2010	1
5	2011	4
6	2012	2
7	2013	3
8	2014	3
9	2016	1
10	2017	2
11	2021	1
12	2022	3



**Fig. 1.** The Annual Trend Chart of Genetic Algorithm Research in China's Library Sector

#### 3.2 Research Institution

Research institution analysis is based on the number of papers published by research institutions in the field of Genetic Algorithm research in China's Library Sector for revealing the number of research institutions and research power of Genetic Algorithm research in China's Library Sector in present. The field of Genetic Algorithm Research in China's Library Sector has 25 research institutions, and the number of papers published by research institutions greater than 1 includes Kunming University of Science and Technology, Mudanjiang Normal University,Chongqing University of Technology,Ludong University.Table 2 is the distribution table of research institution of Genetic Algorithm Research in China's Library Sector.

Table 2 shows:(1) The research institution of the largest number of papers published includes Kunming University of Science and Technology and Mudanjiang Normal University. It shows that Kunming University of Science and Technology and Mudanjiang Normal University are the largest research power of Genetic Algorithm Research in China's Library Sector in present, and makes a great force for the development of this research field of Genetic Algorithm Research in China's Library Sector. And the follows research institution includes Chongqing University of Technology Ludong University, and so on;(2)Although the research field of Genetic Algorithm Research in China's Library Sector has researched and practiced more than ten years, it has not formed core institutions.

**Table 2.** The distribution table of Research Institution(Number of Papers published  $\geq 2$ )

No.	Research institution	Number of Papers published
1	Kunming University of Science and Technology	3
2	Mudanjiang Normal University	3
3	Chongqing University of Technology	2
4	Ludong University	2

#### 3.3 Published Journal

Published Journal analysis is based on the number of papers published by Journal in the field of Genetic Algorithm research in China's Library Sector for revealing the publication power of Genetic Algorithm research in China's Library Sector in present[7].The field of Genetic Algorithm Research in China's Library Sector has 21 published journals, and the number of papers published by published journals greater than 1 includes Information Research,Information studies: Theory & Applications and Microcomputer Information.Table 3 is the distribution table of published journal of Genetic Algorithm Research in China's Library Sector.

Table 3 shows:(1) The published journal of the largest number of papers published includes Information Research,Information studies: Theory & Applications

and Microcomputer Information. It shows that Information Research, Information studies: Theory & Applications and Microcomputer Information are the largest publication power of Genetic Algorithm Research in China's Library Sector in present, and makes a great force for the development and propagation of this research field of Genetic Algorithm Research in China's Library Sector. And the follows published journal includes Library Work and Study ,Foreign Electronic Measurement Technology, Sci-Tech Information Development & Economy, Bulletin of Science and Technology, Journal of Chongqing University of Science and Technology (Natural Sciences Edition) , and so on;(2) Although the research field of Genetic Algorithm Research in China's Library Sector has researched and practiced more than ten years, it has not formed core published journals.

**Table 3.** The distribution table of Published Journal

No.	Published Journal	Number of Papers published
1	Information Research	2
2	Information studies: Theory & Application	2
3	Microcomputer Information	2
4	Library Work and Study	1
5	Foreign Electronic Measurement Technology	1
6	Sci-Tech Information Development & Economy	1
7	Bulletin of Science and Technology	1
8	Journal of Chongqing University of Science and Technology (Natural Sciences Edition)	1
9	Information Science	1
10	Modern Computer	1
11	modern electronics technique	1
12	New Century Library	1
13	Computer Applications and Software	1
14	Computer CD Software and Applications	1
15	Computer and Modernization	1
16	Fujian Computer	1
17	Data Analysis and Knowledge Discovery	1
18	Logistics Engineering and Management	1
19	Journal of Central South University for Nationalities ( Natural Science Edition )	1
20	Chinese Journal of Medical Library and Information	1
21	Journal of Jilin Institute of Architectural Engineering	1

### 3.4 Research Hotpots

Research hotpots analysis is based on the number of keywords of papers published in the field of Genetic Algorithm research in China's Library Sector in order to

reveal the distribution of keyword and hot topics of Genetic Algorithm research in China's Library Sector in present[8].The field of Genetic Algorithm Research in China 's Library Sector has 60 keywords, and the frequency of appearance of keyword greater than 1 includes " Genetic Algorithm " (24), " library " (6), " BP neural network"(3), "neural network"(3), "Data mining" (3), " digital resources " (3), " college library " (2), "association rules"(2),"clustering" (2),"digital library"(2), "library management"(2),"literature resources"(2).Table 4 is the frequency of appearance of keyword of Genetic Algorithm Research in China's Library Sector.

Table 4 shows:(1) Except for search keywords, the most frequency of appearance of keyword includes "BP neural network", "neural network", "Data mining" and "digital resources";(2) At present, hot topics of Genetic Algorithm research in China's Library Sector include " the deeply application of genetic algorithm in the construction of library digital resources and the association rules mining", "the service quality assessment of library digital resources and the model construction of library digital resources aggregation quality predicting based on Genetic Algorithm", "the deeply application of BP neural network in the assessment of information service and the service quality assessment of digital resources in library", "the deeply application of genetic neural network in the evaluation of circulation service quality, the effectiveness evaluation of library and the measurement of the informationization level in library", "the deeply application of genetic algorithm in library management, document resource service, digital library and directional signs", and so on.

**Table 4.** Frequency of appearance of keyword

No.	keyword	Frequency of appearance of keyword
1	Genetic Algorithm	24
2	library	6
3	BP neural network	3
4	neural network	3
5	Data mining	3
6	digital resources	3
7	college library	2
8	association rules	2
9	clustering	2
10	digital library	2
11	library management	2
12	literature resources	2

### 3.5 Academic dissemination degree

Academic dissemination degree analysis is based on the number of citation of papers published in the field of Genetic Algorithm research in China's Library Sector in

order to reveal the academic influence and the distribution of papers with high academic attention degree in the filed of Genetic Algorithm research in China's Library Sector in present[9]. The most cited paper is "Research on library performance evaluation Based on genetic neural network" in the field of Genetic Algorithm Research in China's Library Sector .Table 5 is the frequency of appearance of keyword of Genetic Algorithm Research in China's Library Sector.

Table 5 shows:(1) The highest number of citations is 15, and this paper mainly discusses the application of genetic neural network for library performance evaluation. It shows that the application of genetic neural network for library performance evaluation is the most academic influence research topic in the field of Genetic Algorithm Research in China 's Library Sector at present;(2)These academic papers that are high academic influence are mainly published on the Information Studies:Theory & Application.The next journals are Data Analysis and Knowledge Discovery,Computer Applications and Software,Library Work and Study.They are the important core journals in the filed of computer and library.

**Table 5.** The distribution table of high cited papers

No	Title	Author	Journal	Number of Citation
1	Research on library performance evaluation Based on genetic neural network	Wei Zhao; Xiuhu a Zhang	Information Studies:Theory & Application	15
2	Construction of Aggregation Quality Predicting Model for Digital Resource in Library ——Based on Improved Genetic Algorithm and BP Neural Network	Yan Jing ; Bi Qiang; Li Jie; Wang Fu	Data Analysis and Knowledge Discovery	13
3	Research on the application of the improved K-Means algorithm for library topic mining	Chuping Song; Shaoqin Li	Information Studies:Theory & Application	10
4	PREDICTING LIBRARY LITERATURE RESOURCES REQUIREMENT BASED ON GA-LSSVR	Lihua Wang	Computer Applications and Software	9
5	Research on the application of Data Mining for public library	Fengning Ma	Library Work and Study	9

#### 4. Conclusion

Through researchers have deeply researched and practised on Genetic Algorithm Research in China's Library Sector more than ten years, Genetic Algorithm Research in China's Library Sector has some problems, such as too few academic research papers, research not deep,research power not enough,and so on. So, Genetic Algorithm Research in China's Library Sector should enhance investment and publicity for attracting more

researcher to join the research filed in order to produce more high-quality research papers.

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