Artificial intelligence recruitment analysis

Xin Zhang[1], Shaohong Zhang[1], Jianyu Liu[1], Liqing Cai[1], Jing Wang[2]

[1] Guangzhou University, School of Computer Science and Cyber Engineering, Guangzhou Guangdong 51064，China

[2] Guangzhou Library, Guangzhou Guangdong 51064，China

Abstract. With the rapid development of the computer industry, the computer processing performance has been continuously improved, and artificial intelligence has been continuously developed and innovated from the beginning of the concept. Artificial intelligence has become an indispensable part of the computer industry. China's domestic emphasis on the artificial intelligence industry continues to increase, supporting science and technology enterprises to develop artificial intelligence in depth, and the number of artificial intelligence recruitment in China has been exploding. Nowadays, with the rapid development of artificial intelligence, it is reasonable to analyze the demand for talents in the market, and combine the domestic research status of artificial intelligence to make reasonable suggestions for those who are about to enter the artificial intelligence market.

Keywords: Artificial intelligence, Recruitment, Research, Advice.

1 Introduction

With the continuous development of technologies such as the Internet, big data, cloud computing and the Internet of Things, machine learning and deep learning have matured, computer computing capabilities have increased dramatically, and massive data sets have gradually formed [1]. A new wave of artificial intelligence is emerging around the world. The Stanford University's "Artificial Intelligence and Life in 2030" report states: "Artificial intelligence has rapidly developed applications in many areas, such as transportation, home service robots, medical health, education, low-resource communities, public safety, work and Employment, entertainment." [2] Artificial intelligence has received policy support from many governments around the world, especially China's policy support for the artificial intelligence industry has continued to increase.

China's artificial intelligence industry is developing rapidly, and the demand for computer talents is increasing day by day. The investment in artificial intelligence industry is gradually increasing. It is estimated that by 2022, the domestic artificial intelligence industry market will reach 68 billion yuan. BOSS's direct TDI index shows that with 2016 Q1 as the benchmark, and then each quarter's talent demand is calculated based on the benchmark value. In 2017, ABC talent demand surged 4.7 times compared with 2016; in the first three quarters of 2018, talent demand continued in 2017. Strong growth, the growth rate dropped slightly to 3.6 times. It is foreseeable that in the next

3 to 5 years, ABC talent demand will continue to grow rapidly, but as the talent base continues to rise, the growth rate will gradually slow down and enter a steady growth trend, as shown in Figure 1. For an emerging industry such as artificial intelligence, it is necessary to analyze the existing industry in order to develop healthy and long-term development in this industry. So as to be able to understand the development trend of China's artificial intelligence industry and industry demand, and be prepared for the development which is ready early.

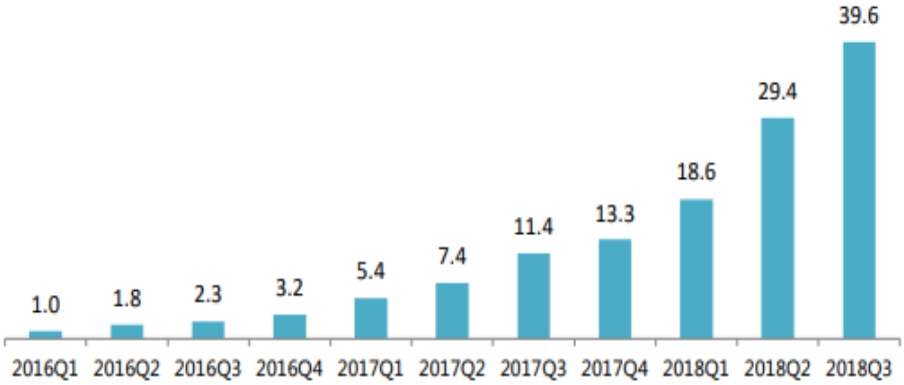

Fig. 1. 2016 Q1-2018 Q3 artificial intelligence ABC talent demand trend.

2 Data collection

In this experiment, in order to study the demand for artificial intelligence talents in China, the data of 51job talent recruitment information was collected. The talent demand in China was analyzed according to the recruitment information, and the demand for artificial intelligence talents in the market was obtained. In order to study the development of artificial intelligence research in China, the paper analyzes the papers in China Knowledge Network. We analyze the development of domestic knowledge research in artificial intelligence according to the publication of these papers.

2.1 51job talent recruitment information

In this paper, in order to study the demand for artificial intelligence talents in China's domestic market, on the domestic recruitment website 51job website, which is https://www.51job.com/, “artificial intelligence” is used as a keyword to search for jobs. Based on all the recruitment data before April 10, 2019 in the whole country, all the data searched on the website will be crawled and stored in Python as the original data for analysis. Divide the information in the recruitment page by category, such as company name, job title, salary, work location, job requirements, etc. The information in the recruitment page is sorted and sorted, and the classified results are stored in an Excel file one by one according to the category, so that the data can be analyzed later. In the Excel file, each row represents a recruitment information. This time, a total of 13,378 recruitment data were collected, and the paper analyzed information according to the data, thus obtaining the domestic demand for artificial intelligence talents.

2.2 China Knowledge Network Paper Collection

In this paper, in order to study the research on artificial intelligence in China, we collect data on https://www.cnki.net/ on China Knowledge Network and use "artificial intelligence" as a key to search all the papers in the database. For subsequent processing, only the Chinese literature will be selected for the searched articles. After searching, a total of 100893 papers were obtained, and the papers were sorted and plotted according to the year, as shown in Figure 2. As can be seen from the figure, before 2014, the domestic artificial intelligence field, the article has been in a relatively stable growth state, but from 2015, artificial intelligence articles began to show explosive growth, and according to the previous growth trend, It is estimated that in 2019, there will be 17,887 articles on artificial intelligence published.

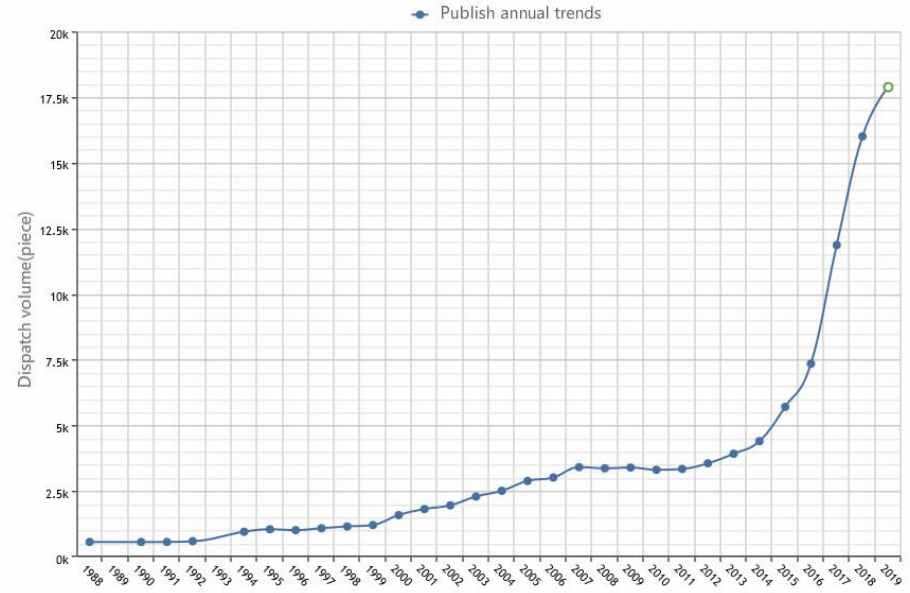

Fig. 2. Artificial intelligence paper publishing curve (Image from China Knowledge Network)

3 Data processing and analysis

After the collected recruitment data and the thesis data, the content is first sorted and classified, and the non-standard data is selected to ensure the consistency of the data. Secondly, the recruitment information and the thesis data are collated and calculated according to their respective methods [4-6], thereby obtaining data results that can be analyzed.

3.1 Recruitment information processing

All the recruitment information that will be collected will be first divided according to the work place, and the data with the same work place will be analyzed together.

According to statistics, the number of recruitment information of artificial intelligence posts in different cities in China is shown in Figure 3, and the number of recruits ranked in the top 15 cities for display. As can be seen from the figure, for the artificial intelligence posts, Shanghai, Shenzhen, Guangzhou, Beijing and other first-tier cities still have a large demand gap. Hangzhou, Wuhan, Chengdu, Nanjing and other technology industrial cities, the demand for artificial intelligence is also very large. After analysis, it can be seen that the demand for artificial intelligence is mainly concentrated in cities with developed economy and technology industry.

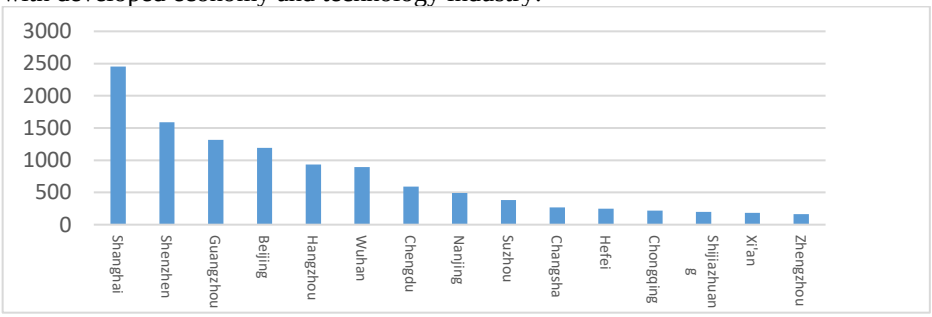

Fig. 3. Artificial intelligence recruitment city distribution

After analyzing the industry in which the recruitment company is located, the industry in which the company is located is statistically analyzed. The results are shown in Figure 4. As can be seen from the figure, most of the companies that recruit artificial intelligence posts belong to the computer software, Internet, and e-commerce fields. In addition, many companies belong to the education, electronics, finance, and academic research industries. From this point, we can see the importance of artificial intelligence posts for technology-based companies. It is worth mentioning that the financial and education industries have also generated a lot of demand for artificial intelligence technology, and it is also a good employment direction.

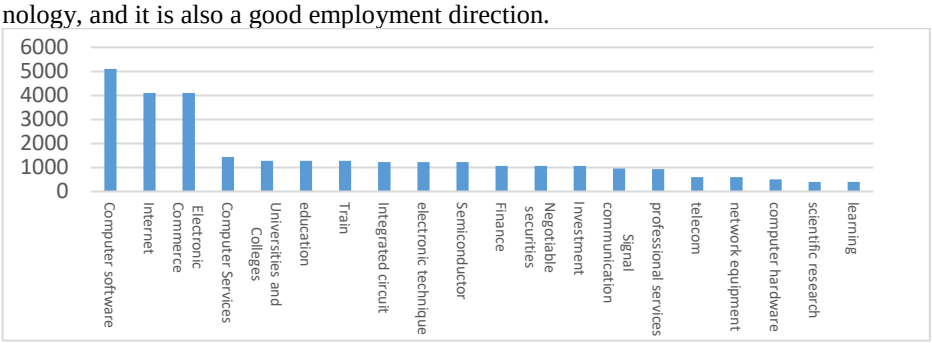

Fig. 4. Recruiting the industry in which the company is located

The academic requirements, work experience requirements, and salary in the recruitment information are analyzed, as shown in Figure 5. As can be seen from the figure, the qualifications of recruiting companies for the candidates are mainly undergraduate

students, and the gaps in the talents with high academic qualifications are also large. In terms of work experience, there is no work experience, followed by 3-4 years of work experience, and the remaining work experience is more evenly distributed. It can be seen that in the work experience, most of the recruitment companies take care of the newly graduates, with no work experience. However, more than half of the jobs require work experience, which shows the importance of work experience. In terms of wages, the annual salary is mostly below 300,000, of which 100,000-200,000 is the overwhelming majority. However, it can be seen that there are also high-tech jobs.

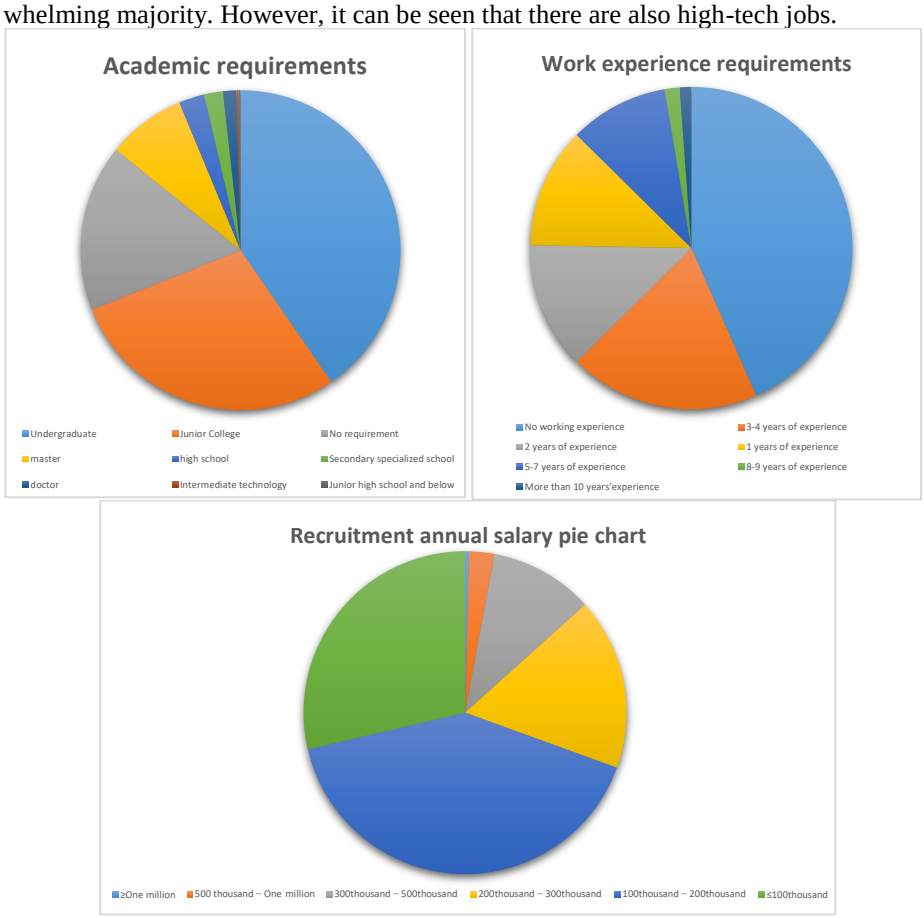

Fig. 5. Educational requirements, work experience requirements, salary pie chart

The processed recruitment information is extracted, and the description of the work content and job requirements in the recruitment information is extracted, and the data of the two parts are processed and analyzed. Collect all the collected data, use python to process the text, and use the jieba tokenizer to segment the data in the description section. After segmenting the description part of the collected 13378 job postings, deleting the stop words and irrelevant words, the number of occurrences of each word is counted and displayed using a histogram. The results are shown in Fig. 6. In the words

with the highest number of rankings, it can be seen that when recruiting, the company valued whether the applicant has relevant work experience and project experience, whether it has good relations with the customer and the team, and it is very important for the research and development ability. Applicants need to combine machine learning knowledge with theory and have the appropriate learning ability.

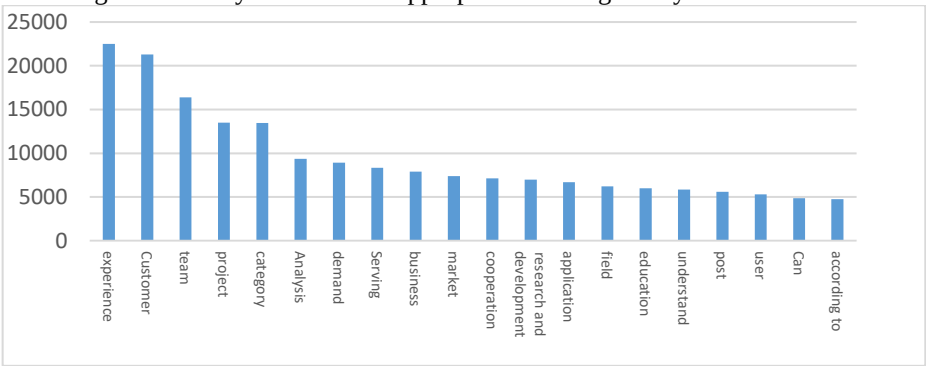

Fig. 6. Recruitment description participle result

3.2 China Knowledge Network Paper Processing

In order to analyze the domestic research status of artificial intelligence, use the keyword search method in China Knowledge Network, and use "artificial intelligence" as a key to view all Chinese articles in the database. All the literature data that will be obtained are first sorted according to the year. As shown in Figure 2, it can be seen that the domestic research on artificial intelligence is increasing year by year, indicating that the research of artificial intelligence in China is still developing and improving.

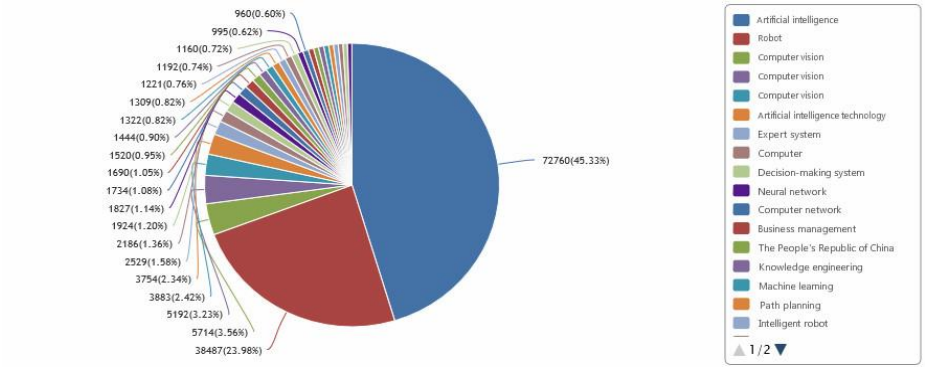

Fig. 7. Artificial intelligence literature topic pie chart (Image from China Knowledge Network)

Secondly, all the documents are classified according to the subject of their research, and the results are drawn into a pie chart, as shown in Fig. 7. It can be seen from the literature distribution map of the literature that the scope of the literature in the field of artificial intelligence involves a very broad range of topics, mainly focusing on artificial intelligence. Other popular research topics involve robots and computer vision.

The keywords in all the documents are extracted, and the extracted keywords are sorted according to the number of occurrences thereof, and the results are plotted as a histogram, and the results are shown in FIG. 8. It can be seen from the figure that in the process of artificial intelligence research in China, the top ranking of keyword occurrences is still artificial intelligence, robots, and computer vision. It can be seen that in the domestic research on artificial intelligence, robots and computer vision systems are the main research directions. In addition, the research direction of the expert system is also closely followed, and other aspects of research are slightly inferior.

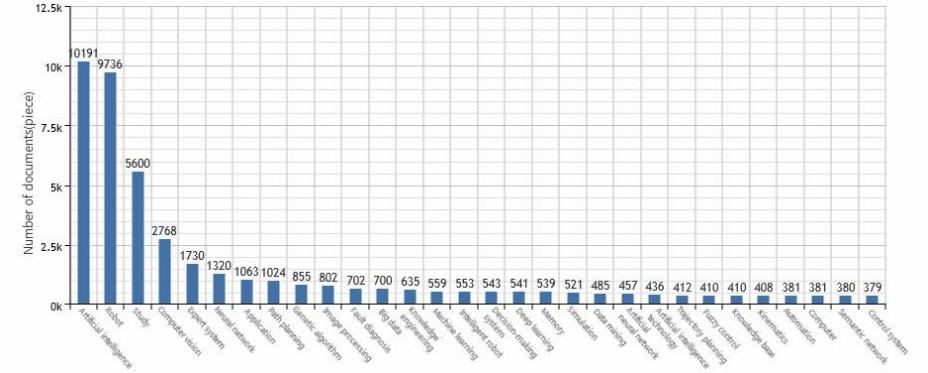

Fig. 8. Histogram of key occurrence words in the paper (Image from China Knowledge Network)

In addition, in order to study the development status of artificial intelligence research in different regions, according to the author's school, the articles in the same school are integrated, and the data histogram according to the school is shown in Figure 10. As can be seen from Figure 9, Harbin Institute of Technology ranks first in the number of published artificial intelligence articles, followed by Shanghai Jiaotong University and Zhejiang University. The total number of articles published by these three universities is more than one thousand. Tsinghua University, South China University of Technology and other universities, the total number of articles published by them is also relatively high. Based on the rankings of published articles in all schools, it can be seen that in the domestic research on artificial intelligence, the main force is still concentrated in the science and engineering schools before the strength test.

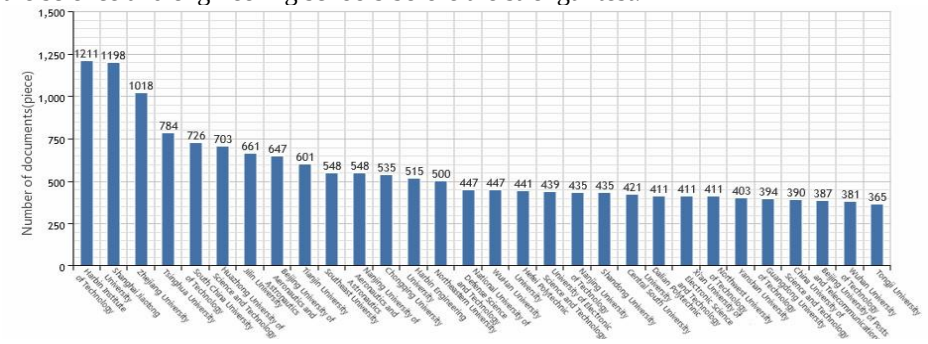

Fig. 9. School published a number of histograms (Image from China Knowledge Network)

4 Conclusion

According to the analysis of China's domestic recruitment market and research literature, it can be seen that for those who want to enter the artificial intelligence industry, there are the following suggestions. 1, in the choice of workplace, mainly in the first-tier cities and cities with developed technology, these cities have a large gap, suitable for the development of artificial intelligence. 2. Before work, it is recommended that you actively participate in relevant projects in the school, accumulate sufficient experience, learn more relevant algorithms and improve your academic qualifications as much as possible. These are all in the market. 3, in the choice of the school, it is recommended to give priority to the strength of the physical engineering school, these schools in the field of artificial intelligence research is more in-depth, easy to learn this knowledge. 4. In the study of knowledge points, it is recommended to use robots, computer vision, and expert systems as research directions. These studies have a deep research history and are also needed in society.

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