Research status and hotspot analysis of literature metrology in artificial intelligence field

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Abstract: It is of great significance to describe the innovation track of emergency management digital research through metrology for better grasping the theoretical system and subject frontier, and promoting the practice of emergency management digital. In this paper, artificial intelligence (AI) papers published in the world from 2010 to 2019 in the SCI database of Web of Science are taken as the research object to explore the influence of countries in the field of AI research and the current hot areas, so as to provide data support and decision-making reference for AI policy making. It is found that in the process of the development of the digitalization of emergency management from scratch, a novel and complete research system has been formed, which takes the digitalization of emergency management technology as the core and takes the digitalization of emergency management organization, the digitalization of emergency management environment and the digitalization of emergency management objects as the foundation. Further studies have found that digital frontier including emergency management in large data, mobile Internet, Internet of things, technology innovation, and AI as the representative of volunteers to digital citizens in emergency management, digital and digital community, represented by the main body of innovation, and to no one digital dynamic emergency management and the digitization of emergency management as a representative of management innovation. Finally, the study concludes that the digital integration of emergency management consists of two parts: risk information and emergency response.

1. Introduction
With the rapid rise of AI technology in the world, governments of various countries have formulated and introduced various AI policies, which makes the international competition of AI increasingly fierce [1]. Take developed countries as an example. In 2016, former US President Barack Obama held five conferences on AI work, and three official reports were released on the basis of this. Subsequently, the United Kingdom, Germany, Japan and other countries also put forward the AI policy as the core of their future work [2].

Scientific and technological literature and patents are the main forms and carriers of scientific research results. In the field of global AI research, scholars mainly explore its development status and research frontiers from patents or literature data. For example, Zhang Zhengang et al. used patent measurement to analyze the distribution of research strength in the field of AI. Using CiteSpace to draw the knowledge map of AI and mining the key technologies and hot spots in the field of AI; Zou Bentao et al. [3] identified the frontier of AI research by using mutation term detection method and analyzed its evolution according to literature data. Ren Liqiang et al. [4], based on journal papers, made a visual
analysis of the research progress in the field of AI from five aspects: cooperating countries, research institutions, citations, keywords and emergence words.

In order to comprehensively analyze the current status and hot topics of AI research, this study is based on the Scopus database and the SciVal research and analysis tool, focusing on the scientific and technological articles in the field of AI from 2014 to 2019. Literature metrology indicators were used to quantitatively analyze the information of academic output, citations, cooperation, academic institutions, research hotspots and frontiers in the field of AI, so as to provide reference for the development of AI.

2. Data source and measurement evaluation index

2.1 Data sources and analysis tools
Scopus database of Elsevier contains over 23,450 peer-reviewed journals, 75,000 books and more than 9.8 million conference papers from more than 5,000 publishers worldwide, as well as literature resources from some non-English speaking countries and regions [5]. SciVal is a research and analysis tool that shares the Scopus database and quantified the results of more than 14,000 research institutions in 230 countries and regions. Visualized display of relevant evaluation indicators provides services for scientific research management and decision-making of universities and academic research institutions [6]. Based on the data source of Scopus, this study selected the field of AI (science code: 1702) from the ASJC classification (that is, according to the discipline of the journal in which the paper was published) for retrieval. The retrieval date was May 16, 2020, and the earliest retrieval date was 1954. 744,569 academic outputs (including conference papers, journal papers, etc.) were obtained, involving 21 disciplines.

2.2 Bibliometric indicators
Academic output mainly includes the quantity and type of academic output.

Citation of academic output, including total citation, average citation, top 1% high citation ratio and top 10% high citation ratio. Among them, the top 1% and top 10% highly cited ratio is the ratio of the number of the top 1% and 10% of the listed literatures in the world according to the publication year and the number of cited literatures in the selected field to the total literatures in the selected field and publication year.

Field-weighted citation impact (FWCI) is the normalized influence of a paper, which calculates the ratio of the citation times of literature in the AI field to the average citation times of literature in the same discipline, in the same year, and of the same type. The body calculation formula is as follows:

\[
FWCI = \frac{1}{N} \sum_{i=1}^{N} \frac{c_i}{e_i}
\]

Where: \(N\) is the total number of messages sent; \(c_i\) represents the citation frequency of \(f\); \(e_i\) represents the expected citation frequency of all similar literatures within 3 years after publication.

FWCI eliminates the difference between different disciplines and publication years through normalization, and is mainly used to evaluate the quality of academic output. It is currently the internationally recognized optimal method for quantitative evaluation of the quality of scientific research papers [7]. Therefore, in the analysis of the influence of academic output of countries/regions, institutions and collaborative research in the field of AI, FWCI is used as the indicator for ranking analysis.

(1) Participating scholars refer to the number of scholars participating in the research in the academic results produced.

The term "funding fund" refers to the name, amount and number of relevant research projects supported by the fund.

Cooperation analysis, used to evaluate the types of cooperation at the country/region, institution and other levels. Among them, the cooperation types of academic output include international cooperation,
domestic cooperation, institutional cooperation and independent creation. According to the cooperation with enterprises, there are school-enterprise cooperation and no school-enterprise cooperation. According to the practice of Zhang Zhengang et al. [2], the influence of cooperation can be calculated by dividing the total citation number of the cooperative literature by the total number of the cooperative literature.

Study topic and topic significance index. In SciVal, the direct reference clustering method is adopted to identify the topics in the entire AI field at one time [8], and a total of 96,000 scientific topics are obtained. The significance index for each topic was calculated separately. The theme significance index is an indicator to measure the visibility and development momentum of the theme. The larger the value, the more attention the theme will receive and the faster the growth momentum will be. In this study, the most recent cited amount, the most recent page views and journal citations were comprehensively considered, and the common formula for calculating the significance of each topic j in the n year was as follows [9]:

\[
P_j = \frac{0.4950 \times (C_j - \text{mean}(C_j))}{\text{stdev}(C_j)} + \frac{0.3920 \times (V_j - \text{mean}(V_j))}{\text{stdev}(V_j)} + \frac{0.1149 \times (CS_j - \text{mean}(CS_j))}{\text{stdev}(CS_j)}
\]

Where, \(C_j\) is the number of citations of papers published in the n year and n+1 year of topic j; \(V_j\) is the number of Scopus page views of papers published in year n and year n+1 in topic J; \(CS_j\) is the average number of citations published in the n year. In order to reduce the partial data, the original data underwent logarithmic transformation.

3. Statistical results and analysis

3.1 Academic output and distribution

3.1.1 Overall situation

According to the number of more than 700,000 articles retrieved and the number of 21 disciplines involved, it can be seen that the research of AI has the characteristics of interdisciplinary integration and a wide range of application space. As shown in Figure 1, AI research can be divided into three stages: the annual average number of articles from 1954 to 1984 was less than 1000, which was in the exploratory stage. From 1988 to 2004. The annual average number of articles was less than 100,000 but showed a gradual upward trend, indicating that the attention to the field of AI was increasing. From 2005 to now, the field of AI has developed steadily. In 2009, the research reached a peak. Then, the number of relevant literature declined briefly and continued to increase until now.

![Figure 1. Annual distribution of sample literature in AI](image)

3.1.2 Analysis from 2014 to 2019

In order to analyze the development status of relevant academic outputs and institutions in the field of AI, the research period is selected from 2014 to 2019. An overall analysis of academic output in the field of AI was made based on Scopus database and SciVal analysis tool (Table 1).
Table 1. Statistics of academic output in the field of AI from 2014 to 2019

| Indicator                  | Year       | Mean     |
|----------------------------|------------|----------|
|                            | 2014       | 2015     | 2016     | 2017     | 2018     | 2019     | 2019     |
| Amount of literature       | 36772      | 37349    | 49438    | 59573    | 74241    | 87225    | 57433    |
| Participation              | 79829      | 83846    | 111672   | 138090   | 176251   | 211794   | 133580   |
| Financial support          | 5.55       | 17.20    | 14.68    | 15.29    | 14.65    | 17.14    | 14.08    |
| Total cited                | 380378     | 359226   | 331409   | 302904   | 204547   | 66617    | 274180   |
| Single cited               | 10.4       | 9.6      | 6.7      | 5.1      | 2.8      | 0.8      | 4.8      |
| Top 1% high citation ratio | 1.0%       | 1.0%     | 0.9%     | 1.0%     | 0.9%     | 0.7%     | 0.9%     |
| Top 10% high citation ratio| 8.4%       | 8.8%     | 7.5%     | 7.4%     | 7.2%     | 5.3%     | 7.1%     |
| International cooperation ratio | 19.1% | 20.2%    | 18.5%    | 17.9%    | 17.6%    | 17.5%    | 18.2%    |
| Institutional partnership ratio | 44.6% | 44.6%    | 47.0%    | 48.2%    | 50.2%    | 49.3%    | 48.0%    |
| Individual composition proportion | 10.1% | 9.1%     | 8.3%     | 7.8%     | 6.5%     | 6.4%     | 7.7%     |
| Cooperation Ratio in China | 26.2%      | 26.0%    | 26.1%    | 26.1%    | 25.6%    | 26.8%    | 26.2%    |

As can be seen from Table 1 and Figure 2, the amount of literature increased year by year during the study period, and the amount of published articles in 2019 was even more than twice that in 2014. This is mainly because with the increasing interest in AI research, more and more scholars have invested in related fields. This can also be confirmed by the increasing trend of the number of participating scholars in Figure 3.

As shown in Figure 4, in terms of fund support, the overall financial support for AI research also showed an increasing trend during the research period. Although global financial support showed a slight decline after a huge increase in 2015, it returned to parity in 2019.
As shown in Figure 5-6, both the total citation and total citation of literatures decreased year by year during the study. Mainly because compared with the recently published literatures, literatures with an earlier age were read more, and more work in the later research was completed on the basis of the earlier literatures.

As shown in Figure 7-9, the normalized impact factor and the high citation ratio of top 1% and top 10% in the literature also decreased year by year during the study. Combined with the amount of literature in Table 1, it shows that although the number of literature in the field is on the rise, its overall influence is on the decline.
3.1.3 Classification by country/region

As shown in Table 2, the academic output of the top 10 countries/regions in the field of AI by FWCI from 2014 to 2019. In addition, the top three countries and regions are Switzerland, Singapore, and Hong Kong, China. Although the number of articles published by them is small, the average citation, top 1% and top 10% are in the leading position, and the overall influence and quality are high. Although the number of cited articles in Australia ranked fourth decreased slightly, the number of published articles in Australia was about twice that of the top three. The top 1% and top 10% citation rates of Saudi Arabia, ranked fifth, are much higher than other countries and regions, mainly due to its outstanding contribution in the basic algorithms of AI. According to FWCI value, Mainland China ranks 42nd, with FWCI value of 1.05 and each article cited for 6 times. The proportion of the top 1% highly cited is 1.8%, and the proportion of international cooperation is 22.5%. The above indicators are all lower than the leading countries/regions in the world.

Table 2. Statistics of the top 10 countries and regions in the field of AI by FWCI from 2014 to 2019

| Country/region | FWCI | Amount of literature | Total cited | Single cited | Top 1% high citation ratio | Top 10% high citation ratio | Institutional partnership ratio |
|----------------|------|----------------------|-------------|--------------|---------------------------|----------------------------|-------------------------------|
| Swiss          | 2.11 | 3046                 | 34530       | 11.3         | 2.3%                      | 14.5%                      | 47.7%                         |
| Singapore      | 2.08 | 4636                 | 50618       | 10.9         | 3.2%                      | 16.9%                      | 61.8%                         |
| Hong Kong      | 1.90 | 3854                 | 43020       | 11.2         | 2.7%                      | 19.6%                      | 74.5%                         |
| Australia      | 1.76 | 8984                 | 82780       | 9.2          | 2.7%                      | 14.9%                      | 58.4%                         |
| Saudi Arabia   | 1.70 | 2995                 | 31060       | 10.4         | 4.1%                      | 18.3%                      | 69.1%                         |
| USA            | 1.64 | 46743                | 361730      | 7.7          | 1.5%                      | 10.9%                      | 37.0%                         |
| UK             | 1.61 | 17,519               | 138894      | 7.9          | 1.6%                      | 11.9%                      | 56.5%                         |
| Italy          | 1.48 | 10443                | 66630       | 6.4          | 0.9%                      | 10.7%                      | 42.9                          |
| Canada         | 1.42 | 8781                 | 71505       | 8.1          | 1.6%                      | 10.01%                     | 51.5%                         |
| Germany        | 1.36 | 14910                | 77537       | 5.5          | 0.8%                      | 7.1%                       | 38.5%                         |
| Spain          | 1.36 | 9006                 | 69432       | 7.7          | 1.75                      | 11.8%                      | 48.4%                         |
| Mean           | 1.67 | 118361               | 93430       | 8.8          | 2.1%                      | 13.3%                      | 54.2%                         |
3.1.4 Classification by owning organization

Universities, research institutes and enterprises are different types of innovation subjects, and they all play a vital role in technological innovation. In the field of AI, universities are the core institutions of academic output. With FWCI as the indicator, the ranking analysis of universities with a certain scale of publication is made. The academic output of the top ten university in the field of AI ranked by FWCI from 2014 to 2019 is shown in Table 3. The United States has five institutions in the top 10, at no. 1, 2, 4, 8 and 9. From Saudi Arabia's King Abdul Aziz University and from the west at the university of granada Spain ranked fifth and the seventh, the top 1% and 10% before highly cited ratio are far higher than that of American colleges and universities, but through SdVal data of deep mining, found that the output of the literature of the world's top journals of colleges and universities is far less than the United States. Therefore, the influence of literature is weaker than the top three universities in the United States.

Table 3. Statistics of FWCI top 10 universities in AI field from 2014 to 2019

| High school                      | FWCI | Amount of literature | Total cited | Single cited | Top 1% high citation ratio | Top 10% high citation ratio | Institutional partnership ratio |
|----------------------------------|------|----------------------|-------------|--------------|---------------------------|-----------------------------|-------------------------------|
| California, Berkeley             | 3.55 | 972                  | 17706       | 18.2         | 4.8%                      | 20.8%                      | 36.6%                         |
| Stanford University              | 3.46 | 975                  | 23953       | 24.6         | 4.5%                      | 20.3%                      | 32.0%                         |
| ETH Zurich                       | 2.92 | 1019                 | 14323       | 14.1         | 4.6%                      | 22.3%                      | 58.4%                         |
| Massachusetts Institute of Technology | 2.87 | 1691                 | 28445       | 16.8         | 2.7%                      | 18.7%                      | 38.3%                         |
| King Abdul Aziz University       | 2.79 | 887                  | 20339       | 22.9         | 10.3%                     | 39.3%                      | 88.6%                         |
| University of Oxford             | 2.67 | 941                  | 13057       | 13.9         | 2.9%                      | 16.3%                      | 54.3%                         |
| University of Granada            | 2.57 | 717                  | 12865       | 17.9         | 8.8%                      | 30.5%                      | 58.4%                         |
| Harvard University               | 2.55 | 745                  | 9407        | 12.6         | 2.8%                      | 18.9%                      | 45.8%                         |
| University of Michigan           | 2.5  | 729                  | 14776       | 20.3         | 1.5%                      | 13.4%                      | 28.9%                         |
| University of Toronto            | 2.39 | 716                  | 16222       | 22.7         | 17%                       | 12.4%                      | 48.1%                         |
| Mean                             | 2.83 | 939                  | 17110       | 18.4         | 4.5%                      | 21.4%                      | 48.9%                         |

3.1.5 Analysis from 2014 to 2019

As shown in Table 4, the top 10 research institutes in the field of AI by FWCI worldwide from 2014 to 2019. It can be found that, except for Centrum Wiskunde & Informatica (CWI) from the Netherlands, other countries and regions of the institute are among the top ten countries and regions of the global FWCI. In particular, three German institutes ranked first, third and fourth respectively, leading the world. German universities are not included in the FWCI top 10, but the strength of their research institutions is not to be underestimated. Spain ranked sixth and ninth, respectively. As can be seen, the academic output of institutes is much smaller than that of universities and shows a serious polarization, with FWCI ranking No. 1 and No. 10 institutes having a large gap in the quality and impact of their academic output.
Table 4. Statistics of FWCI top 10 RESEARCH institutes in ai field from 2014 to 2019

| High school                                      | FWCI | Amount of literature | Total cited | Single cited | Top 1% high citation ratio | Top 10% high citation ratio | Institutional partnership ratio |
|--------------------------------------------------|------|----------------------|-------------|--------------|----------------------------|----------------------------|-------------------------------|
| Max Planck Institute for Computer Science        | 3.99 | 125                  | 3214        | 25.7         | 8.8%                       | 32.8%                      | 76.8%                         |
| The Alan Turing Institute                        | 3.41 | 68                   | 571         | 8.4          | 2.9%                       | 17.6%                      | 44.1%                         |
| Max Planck Institute for Intelligent Systems     | 2.75 | 296                  | 5053        | 17.1         | 3.4%                       | 24%                        | 72.3%                         |
| Max Planck Institute for Biochemistry            | 2.64 | 61                   | 698         | 11.4         | 0                          | 24.6%                      | 63.9%                         |
| Research Center for Mathematics and Computer     | 2.57 | 105                  | 1959        | 18.7         | 3.8%                       | 10.5%                      | 51.4%                         |
| Computer Vision Center                           | 2.46 | 61                   | 698         | 11.4         | 0                          | 24.6%                      | 63.9%                         |
| Laboratory of Systems Analysis and Architecture, | 1.97 | 296                  | 2683        | 9.1          | 1.4%                       | 15.2%                      | 52.0%                         |
| National Centre for Scientific Research          |      |                      |             |              |                            |                            |                               |
| Singapore Agency for Science, Technology and     | 1.87 | 625                  | 6427        | 10.3         | 2.7%                       | 16.6%                      | 48.5%                         |
| Research Institute for Advanced Research in      |      |                      |             |              |                            |                            |                               |
| Catalonia                                         | 1.66 | 98                   | 768         | 7.8          | 1.0%                       | 7.1%                       | 60.2%                         |
| Jet Propulsion Laboratory                         | 1.65 | 118                  | 1069        | 9.1          | 0.8%                       | 14.4%                      | 33.9%                         |
| Mean                                             | 2.83 | 939                  | 17110       | 18.4         | 4.5%                       | 21.4%                      | 48.9%                         |

AI technologies are becoming increasingly mature, and enterprises are playing a leading role in technology research and development and innovation. As shown in Table 5, looking at the top 10 FWCI companies in AI from 2014 to 2019, companies are playing an increasing role in AI. In particular, companies such as Facebook, Alphabet, and Microsoft (USA) have higher FWCI values than universities and research institutes. Most of the companies are from the United States and China, with Japan's SoftBank Group in fifth place. It is worth noting that Alphabet and Microsoft (USA) not only have higher academic influence, but also have higher academic literature output, both of which are higher than the average of the top 10 companies. In addition to the top three companies in the United States, there are Qualcomm, Yahoo LABS ranked 6, 9 respectively. American companies have taken a commanding lead in AI. Chinese companies iFlytek, SenseTime, Tencent and Baidu ranked fourth, seventh, eighth and tenth respectively, indicating that Chinese enterprises are leading the world in AI technology, but the output of academic achievements is low.
Table 5. Statistics of FWCI top 10 AI enterprises from 2014 to 2019

| High school            | FWCI | Amount of literature | Total cited | Single cited | Top 1% high citation ratio | Top 10% high citation ratio | Institutional partnership ratio |
|------------------------|------|---------------------|-------------|--------------|---------------------------|-----------------------------|-------------------------------|
| Facebook               | 6.89 | 138                 | 6347        | 46.0         | 8.7%                      | 30.4%                       | 50.7%                         |
| Alphabet               | 5.65 | 589                 | 16066       | 27.3         | 7.3%                      | 24.6%                       | 43.0%                         |
| Microsoft              | 4.18 | 1085                | 30618       | 28.2         | 5.8%                      | 25.9%                       | 47.1%                         |
| Kedaxunfei             | 3.76 | 26                  | 513         | 19.7         | 7.7%                      | 38.5%                       | 43.2%                         |
| Software Banking Group | 3.02 | 30                  | 175         | 5.8          | 0                         | 13.3%                       | 50.0%                         |
| Qualcomm               | 2.85 | 37                  | 355         | 9.6          | 2.7%                      | 18.9%                       | 29.7%                         |
| Shangtang              | 2.64 | 39                  | 354         | 9.1          | 7.7%                      | 24.6%                       | 69.2%                         |
| Tencent                | 2.59 | 165                 | 1299        | 7.9          | 4.8%                      | 24.2%                       | 57.0%                         |
| Yahoo labs             | 2.50 | 131                 | 2744        | 20.9         | 4.6%                      | 19.1%                       | 48/1%                         |
| Baidu                  | 2.46 | 143                 | 1807        | 12.6         | 3.5%                      | 24.5%                       | 47.6%                         |
| Mean                   | 3.65 | 238                 | 6027        | 18.7         | 5.3%                      | 24.5%                       | 48.5%                         |

### 3.2 Research hotspots and frontiers

According to thesaurus of all disciplines, one or more keywords with high relevance are selected for each document based on inverse document frequency [11].

#### 3.2.1 Study hot word analysis

Based on the key word analysis module provided by SciVal, this paper analyzes the key words of academic output in the field of AI from 2014 to 2019, calculates the number of academic output corresponding to each key word, and determines the research heat of this key word. The key words with the highest heat degree in the field of AI include Models, Algorithms, Algorithms, Applications, Experiments, etc. The scientific output focuses on the basic research of Algorithms, Models, etc. The range of applications is also expanding [12].

The research popularity of hot words in different times can show the development and change process of a research problem, and the key nodes and emerging trends in the research field or direction can be found from it. As shown in Figure 10, the trend of the top ten keywords were exhibited. It can be found that the research on basic theories such as model and algorithm has always been the focus of research in the field of AI in recent years. Algorithms and models are complex multi-dimensional functions that process data sources and output according to instructions. They are the core and foundation of AI [13].

![Figure 10. The top ten keywords in AI research trend.](image-url)
As shown in Figure 11, the early application of AI mainly focused on dynamics and robotics. However, with the increase of application scenarios, the demand for AI technology also increased, and neural network, learning system and classification problems became the key technical problems.

![Figure 11. Trends of the top 11 to 20 keywords in AI.](image)

As shown in Figure 12, in the application of AI, prediction and evaluation are two key researches, and more and more scholars are engaged in prediction and evaluation research. In addition, communication technology has attracted more and more attention, mainly because with the rich application scenarios, human intelligence has gradually evolved from single intelligence to swarm intelligence. Therefore, communication technology, as a link connecting AI, has received more research.

![Figure 12. Trends of the top 21 to 30 keywords in AI.](image)

As shown in Figure 13, feature extraction is a pre-processing step in machine learning and the basis of algorithms in the field of AI. In recent years, the research on feature extraction has been paying increasing attention. Data mining and image identification are basic technologies in the field of AI. In recent years, research on these technologies has been increasing in general, but their development tends to be stable after 2018, with a slight decrease in attention in 2019.

![Figure 13.](image)
As shown in Figure 14, cybernetics once became a hot research topic due to the combination of AI and robot field in the early stage, but the heat of cybernetics declined after 2017. As a representative algorithm of deep learning, convolutional neural network is widely used in image processing, video processing and other aspects. Since 2014, the research interest has been increasing.

4. Discussion and conclusion

4.1 Research Conclusion

Based on the Scopus database and SciVal research analysis tool, this study analyzed the academic output, collaboration and influence, research hotspots and topics in the field of AI from 2014 to 2019. The main conclusions are as follows.

(1) From the perspective of time distribution, the field of AI in the world is of high interest, academic output continues to increase, and research has entered a stage of rapid development.

(2) From the dimension of spatial distribution, at the national level, China is the country with the largest number of publications in the world, indicating that During this period, China has invested a lot in AI RESEARCH and development, and attaches great importance to it rapidly. While guaranteeing the number of documents published in sedan chair parade, the United States has outstanding performance in various metrics of its produced literature, and its overall research strength in THE field of AI is at a leading level in the world. Except for the United States, which emphasizes domestic cooperation, other countries with strong research strength all attach importance to international cooperation, and the proportion of international cooperation in their academic output is much higher than the world average level. In institutional point of view, the advantages of American colleges and universities and enterprises,
the German research institute is the main academic institutions into fruit output, output high academic achievements of universities and research institutes in our country, but the results of influence with the world leading level still has certain gap, but Chinese enterprises outstanding academic output, although the output is lower than the United States than in Japan, The overall level is the second in the world and has entered the first echelon in the world.

4.2 Policy Suggestions

Based on the research status and analysis in the field of AI at home and abroad, the following suggestions are put forward:

Guiding and motivating researchers to publish "three high" papers (i.e. papers published in internationally influential domestic science and technology journals, papers recognized by the industry in the international top or important science and technology journals, papers presented in top academic conferences at home and abroad). The number of papers published is the basis, but the quality of research is the key.

Encouraging cooperation and joint research. International, domestic and institutional cooperation, especially among leading international universities and institutions should be encouraged. Research trends should be closely watched, intensified and further integrated into the international mainstream of academia, industry ecology and social media.

Guiding and promoting industry-university-research cooperation and achievement transformation. Universities and research institutions to strengthen cooperation with enterprises, rationally allocate resources of enterprises, universities and research institutes should be encouraged, and conducting targeted research based on market demand, so as to promote technological innovation and promote the industrialization of AI technology.

Focusing on the research of basic theories and key generic technologies in the field of AI, especially in the field of AI core algorithms and basic research to improve the level of research, grasp the topic selection, innovation and breakthrough of ai development frontier; It aims to cultivate academic leaders and pay attention to the introduction and training of talents.

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