ISSN: 2472-3703 DOI: 10.6911/WSRJ.202003_6(3).0035

Research on Hot Topics in Artificial Intelligence Based on Network Timeliness Data

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Abstract

[Purpose/Meaning]: Collecting and analyzing various aspects of artificial intelligence in China, including speeches and articles on artificial intelligence, in order to understand the current development direction of artificial intelligence and future research trends in China. The academic community and the industry provide new ideas and new directions. [Methods/Processes] Use the lda theme model to divide time slices, identify the topic of artificial intelligence in each year, and then explore the frontier topics through the theme's enthusiasm and attention indicators. The classification of cutting-edge topics in the field of artificial intelligence in China. [Results/Conclusions] The research found that there are 9 emerging topics, including "5g network" and "chip". The frontier theme is "robot" research, and the hot topic is " Medical, "financial", "talent", etc.

Keywords

Artificial intelligence; hotspot; research frontier; LDA topic model.

1. INTRODUCTION

In July 2017, the Central Committee of the Communist Party of China and the State Council issued the `` New Generation Artificial Intelligence Development Plan '' [1]. And requirements, indicating that China will rank among the artificial intelligence powers in 2020, complete some major breakthroughs in 2025, and become the world's main artificial intelligence innovation center [2] .In 2018, the Political Bureau of the CPC Central Committee started artificial The status and trends of intelligent development held the ninth collective learning. General Secretary Xi Jinping emphasized that "artificial intelligence is an important driving force for a new round of scientific and technological revolution and industrial change, and accelerating the development of a new generation of artificial intelligence is about whether China can seize a new round Strategic issues of technological revolution and industrial transformation opportunities. "Emphasized the importance of artificial intelligence development. Therefore, we must deeply understand and realize that the development of artificial intelligence is of great significance to the development of science and technology in China.

Zhu Guilong [3] used empirical research methods to build a basic science and patent technology cooperation network in the field of artificial intelligence, and obtained the global development status of artificial intelligence and the interaction between the networks.Takayama [4] studied The impact of the emergence of traditional management methods on enterprises. Yuan Like [5] clustered 28 key technologies used by intelligent robots to analyze the importance of each category to different industries, which is beneficial to different Resource allocation in the industry.Wang Shuang [6] used scientometrics and social network analysis methods to analyze the characteristics and rules of talent growth in the Turing Award artificial intelligence field. Liu Ziqiang [7] explored the U.S. artificial intelligence field.

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The theme evolution lag effect between the fund and the paper. Yu Tian [8] analyzed the current problems of artificial intelligence in the application of bank asset management, and tried to find a solution to the "asset management business + artificial intelligence" in line with the current banking asset management situation. Path, to help the bank's asset management business complete the technological transformation with the emergence of artificial intelligence. Wang Zhen [9] summarized and summarized that artificial intelligence is notThe application in the field and its impact emphasizes the importance of artificial intelligence in the current society. Zhang Xinmiao [10] provides artificial aircraft manufacturers with a strong grasp of the development trend of artificial intelligence through the application of artificial intelligence in various aspects of civil aircraft. Strong reference.Dong Xingyu [11] analyzed the current situation of medical artificial intelligence applications, and proposed corresponding measures in response to current problems in the field of medical artificial intelligence. Fu You [12] began to analyze the application of computer artificial intelligence recognition technology. With a view to promoting the development of related industries.

Zou Bentao [13] probed the frontiers of artificial intelligence research at the micro level from the author's perspective, and found the types and states of research frontiers identified based on different attributes. Lei Haolin [14] used the 2007-2018 library and information professional scholars in the CNKI database. 323 core journal articles about artificial intelligence published as research objects, using bicomb and UCINET software to conduct social network analysis to reveal research hotspots. Wang Qingwei [15] uses literature analysis and knowledge map visualization methods to artificially The origin and development of intelligent research, domestic and foreign research hotspots, and future research trends are compared and visualized. Cui Chunshun [16] uses CiteSpace software to analyze the co-citation relationship of literatures to explore research hotspots and build a co-occurrence network of key emergent words to detect Research Frontiers. Li Chunlin [17] introduced the main technologies used in artificial intelligence in education and some applications of artificial intelligence in foreign language education on the market, and combed the research hotspots of artificial intelligence in foreign language education.

Many scholars have done a lot of research on scientific and technological literature in the field of artificial intelligence, analyzed the current status of artificial intelligence applications, revealed the hot topics of artificial intelligence, and have a certain predictive effect on the future development of artificial intelligence. However, there are also some shortcomings: (1) In terms of data sources, research on artificial intelligence hotspots are based on some literature data for research and analysis.There is no sorting and research on open source and real-time data, so there is a certain time lag.(2) In terms of methods, scholars are conducting hot research based on CiteSpace, only considering the title and abstract, and not considering the word relevance of the entire article.(3) Scholars are limited to mining hotspots in artificial intelligence, and do not identify cutting-edge indicators of hotspots. Based on this, this article will mainly obtain hotspots in the field of artificial intelligence from open source data, using the website of the Ministry of Science and Technology, the website of the Central People's Government, Articles and speeches related to artificial intelligence on China Science and Technology Online are mainly based on the use of LDA topic mining models and cutting-edge topic identification indicators to classify cutting-edge topics in hot topics in the field of artificial intelligence in China in order to better understand the current artificial intelligence field. Development progress and hotspots, predicting future development trends, and providing an important basis for further in-depth research and practical exploration of artificial intelligence.

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2. RESEARCH METHODS AND PROCESSES

2.1. Research Methods

2.1.1 Hotspot acquisition method

The LDA (Latent Dirichlet Allocation) model is a probabilistic model-based text analysis tool proposed by Blei et al. In 2003, which is very effective in mining potential semantics of large-scale texts. Its working principle is:

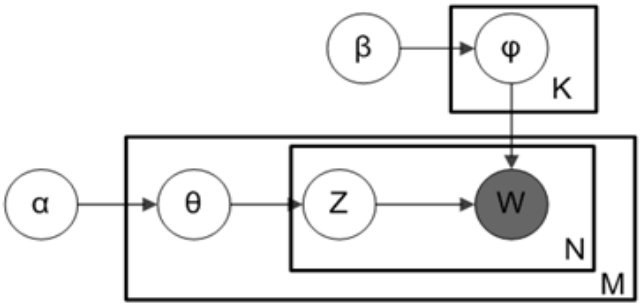

Figure 1. lda schematic diagram

First, from the Dirichlet distribution∝Topic distribution of generated document iθ_i; Secondly, from topic distributionθ_iGenerate the topic of the jth word in the document i$z_{i,j}$From Dirichlet distribution β Generate Theme $z_{i,j}$ Word distribution $\varphi_{zi,j}$; Finally, from the polynomial distribution of the words$\varphi_{zi,j}$Sampling finally generates words$w_{i,j}$And its specific calculation formula is:

$$p(\theta_i, z_{i,j}, \varphi_{zi,j}, w_{i,j} | \propto, \beta) = \prod_{j=1}^{N} p(\theta_i | \propto) p(z_{i,j} | \theta_i) p(\varphi_{zi,j} | \beta)\, p(w_{i,j} | \varphi_{zi,j}) \quad (1)$$

It mainly implements semantic analysis of text data by modeling text topics. Two hyperparameters in the lda topic model∝, βCan be determined based on experience.θwithφIt can be learned by variational inference [18] algorithm or Gibbs sampling [19] algorithm.The authors of LDA used a variational inference algorithm to estimate, and Gibbs sampling algorithm is widely used because it is simple to implement.

2.1.2 Calculation of Discriminative Indicators for Research Frontiers

On the basis of previous research results, this research refers to the leading-edge judgment indicators that are mainly aimed at thesis form, and refers to the cutting-edge topic evaluation indicators that are applicable to this research.It mainly includes: New Index and AmoutIndex. index.

The theme freshness indicator is a measurement indicator that uses the time as a feature to detect the emergence of a theme. Generally, it is believed that the theme's newness will gradually bottom out over time until it declines. Its calculation formula is:

$$NI_k = \frac{1}{k - FY + 1} \quad (2)$$

Where k is the current year,FY(FirstYear) is the year when the theme z first appeared,$(0 \ll NI \ll 1)$

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The topic attention indicator mainly measures the degree of attention of a topic in a period of time. Generally speaking, the topic's degree of attention will change with time, there will be four cases: (1) the degree of attention increases with time The higher.(2) The degree of attention decreases with time.(3) When the theme first appeared, the attention increased for a certain period of time, and then gradually decreased.(4) When the topic first appears, the attention may gradually decrease, and then gradually increase. The calculation formula is:

$$AI_t = \frac{DA_t(z)}{SumDA_t} \tag{3}$$

$DA_t(z)$ Represents the number of documents on topic z in the time period t.$SumDA_t$Represents the total number of documents in the time period t.

There is a difference and connection between the freshness indicator and the attention indicator.The freshness indicator is mainly measured for the time dimension, while the attention indicator is mainly for the number of documents, that is, the topic of interest in the context of researchers or artificial fields. The combination of the two indicators can appear in four theme states: emerging themes, cutting-edge themes, hot themes, and decline themes, forming the life cycle of the theme from emergence to decline. Combined with the Boston matrix in management research, it can form a theme area 2D matrix.

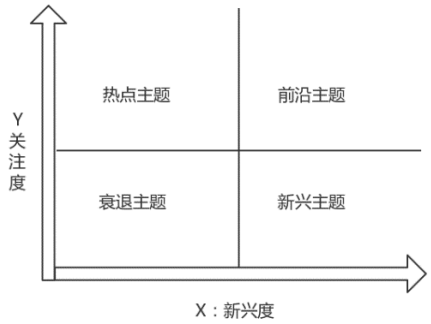

Figure 2. Discrimination of frontier topics

2.2. Research Process

Based on the above research methods, the research framework of this research is proposed:

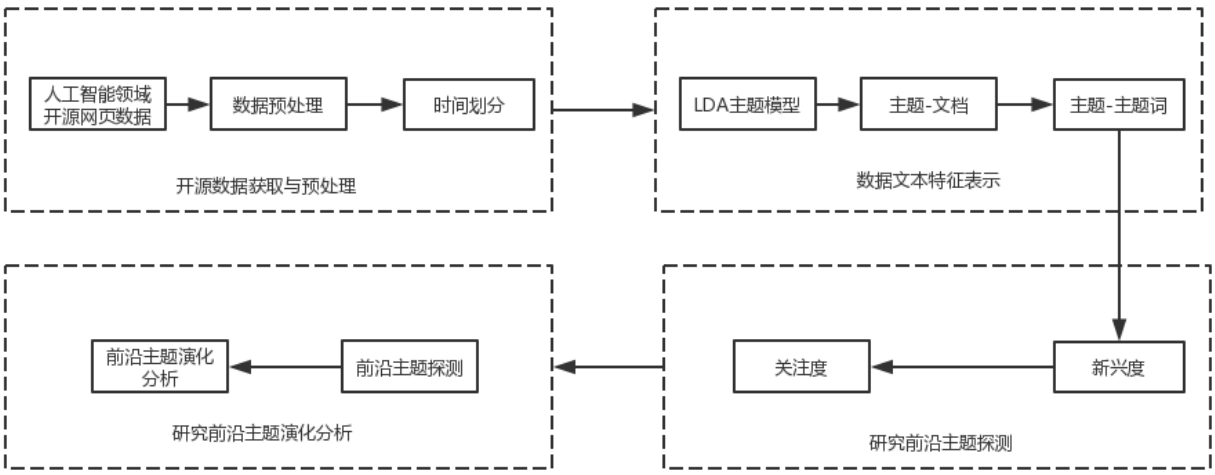

Figure 3. Research Ideas

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First of all, in terms of data sources, this article uses Python to perform web crawling on the public information of the website. For the comprehensiveness of the data, for pages with inconsistent page structures and jumps, the data is mainly obtained manually. For the purpose of this article, I selected scientific and technological data related to artificial intelligence on the three websites of the Ministry of Science and Technology of the People's Republic of China, the website of the Central People's Government, and the Science and Technology Network.

The website of the Ministry of Science and Technology is the department in charge of national science and technology work of the State Council.It is mainly responsible for formulating national innovation-driven development strategies and scientific and technological development, guiding and implementing major national research projects, coordinating key common technologies, and leading-edge technologies. Therefore, the Ministry of Science and Technology represents the direction of China's science and technology development and is an important leader in the development of science and technology. The speeches and articles related to artificial intelligence selected by the Ministry of Science and Technology website have certain authority and representativeness.

The China Government Website is a comprehensive platform for government information and online services on the Internet published by the State Council and various departments of the State Council, as well as the people's governments of provinces, autonomous regions, and municipalities directly under the Central Government. It includes authoritative information such as State Council meetings and the speech of the Prime Minister. On this website, Select AI-related conferences, speeches, and more.

China Science and Technology Network is a comprehensive online media with science and technology news and information dissemination as its main business. In 2010, the Central Foreign Affairs Bureau approved the name of the website as "China Science and Technology Network" and managed it as a national key news website. This website includes the current Information on scientific and technological development and cutting-edge information on science and technology.Select the data under the ai column on the technology online, including ai headlines, frontier recommendations, ai industries, recommendation maps, industry dialogues, top coffee, ai laboratories, and other data.

First, a total of 5666 pieces of data were obtained from three websites, including 150 pieces of data on the Ministry of Science and Technology website, 3280 pieces of data on the Central People's Government website, and 2236 pieces of data on the Sci-tech website. Then the pre-processed data was divided and time was divided. Slice in steps of one year.

Second, topic mining is performed for each time window to obtain the popular topic words each year.

Then, on the basis of obtaining the topic words, the topics are detected according to the emerging index and attention index.

Finally, the topics are divided into different topic types according to the life cycle model: emerging topics, cutting-edge topics, hot topics, and decline topics. The evolution of the topics is analyzed.

3. DATA ANALYSIS

3.1. Subject Recognition

First, time-slicing 2016-2019, taking one year as the step size, divided into 4 time windows, the number of documents obtained each year is shown in Figure 4:

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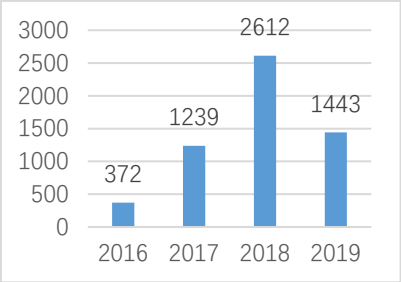

Figure 4. Number of documents

It can be seen from Figure 4 that in the past four years of scientific and technological activities, the country has placed artificial intelligence in a key position, and the number of posts has shown an upward trend.In 2018, a total of 2612 artificial intelligence were involved, and starting from 2019 The number of posts has reached 1,443 in the first half of the year, especially with the advent of the 5g era, artificial intelligence will further develop rapidly in China.

On the basis of data preprocessing such as deduplication and elimination of stop words, python language is used for LDA topic recognition to obtain hot topics in the field of artificial intelligence every year. Before performing topic recognition, first determine the number of topics K In the LDA topic model, in order to obtain better and better model results, the number of topics needs to be set in advance. The number K of topics is mainly determined by the evaluation method of confusion. Its calculation formula is as follows:

$$\text{Perplexity(D)} = \exp(-\frac{\sum \log p(w)}{\sum_{i=1}^{m} N_i}) \tag{4}$$

Among them,$\sum_{i=1}^{m} N_i$Is the sum of all words in the test set, that is, the total length of the test set. $p(w)$ Refers to the probability of each word appearing in the test set. The degree of perplexity decreases with the increase of the number of topics k. When the perplexity curve stabilizes, the k value at this time is the best number of topics [20] .Because there are differences in the number of documents each year, the confusion calculation is performed for each year to obtain the optimal lda model, which will lay the foundation for subsequent topic detection and evolution.

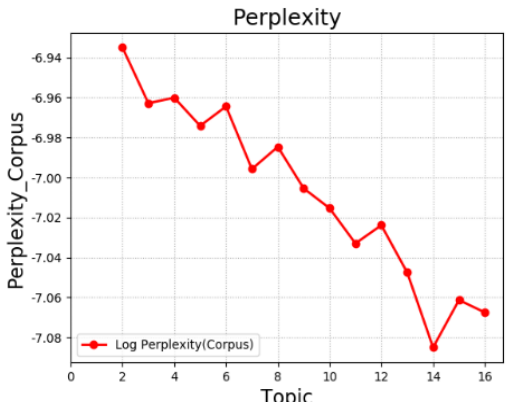

Figure 5. Confusion graph in 2016

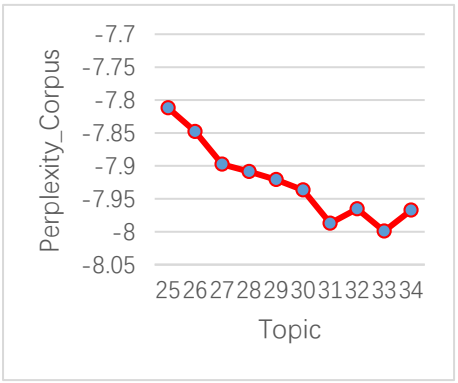

Figure 6. Confusion graph in 2017

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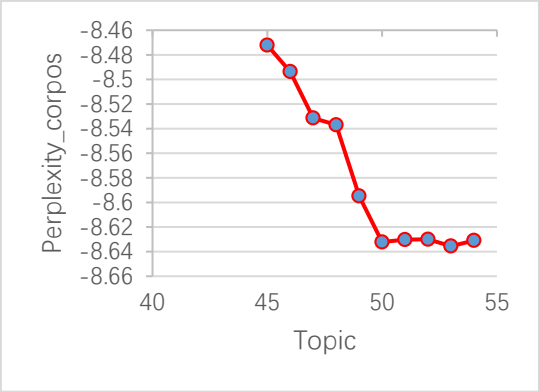

Figure 7. Confusion graph in 2018

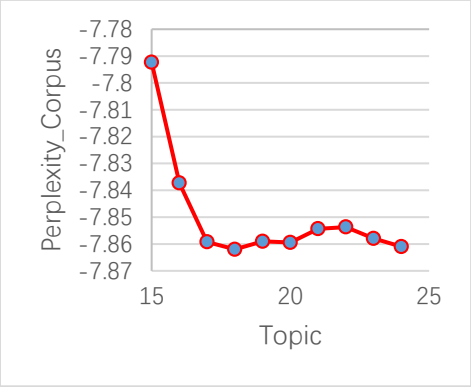

Figure 8. Confusion graph in 2019

In 2016, the field of artificial intelligence mainly focused on keywords such as "double innovation", "talent", "culture", and "manufacturing". Among them, it has a very important role in the growth of China's manufacturing industry, building a manufacturing power, and manufacturing talent Great importance. It is worth mentioning that the G20 Hangzhou Summit in 2016 focused on the governance of the industrial revolution.

Table 1. -2016 theme identification

theme	Key words	Subject description
1	Regulation, finance, risk, system, transportation	Financial risk, transportation system
2	Consumption, Health, Medical, Pension, Tourism	Health care
3	City, service industry, manufacturing, website, growth rate	Growth rate of service industry and manufacturing industry
4	Network, internet, engineering, unit, support	Network support
5	Consumption, Supply, Digital, Culture, Perfection	Improve cultural supply
6	Culture, Zhongguancun, e-commerce, e-commerce, public	E-commerce culture
7	Dual innovation, virtual reality, demonstration, trade, base	Shuangchuang Demonstration Trade Base
8	Emerging industries, innovation, energy, strategic, intellectual property	Intellectual Property in Energy Emerging Industries
9	Implementation, industrial revolution, membership, challenge, structural	The Industrial Revolution
10	Distribution, talent, consumption, manufacturing, high technology	High-tech such as manufacturing
11	Activity, education, talent, base, practice	Education-related information
12	Informatization, quality, brand, power, manufacturing	Building a Powerful Information Industry in Manufacturing
13	Era, system, driverless, baidu, science	Driverless era
14	Summit, Governance, Industrial Revolution, Hangzhou, Countries	Hangzhou Summit

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Table 2. -2017 theme identification

theme	Key words	Subject description
1	Finance, bank, customer, risk, institution	Finance, banking customers, risks and institutions
2	Health, medical, disease, clinical, health	medical health
3	Teacher, education, medical, information technology, hospital	Education, hospital information
4	Website, government, content, ai, video	Ai video content on government websites
5	Logistics, sharing, supervision, production, e-commerce	Sharing and supervision of e-commerce logistics
6	Intellectual property, patent, battery, mechanism, automotive	Achievement protection
7	Driving, car, autonomous, driverless, travel	unmanned
8	Entrepreneurship, entrepreneurship, talent, ai, base	ai entrepreneurial talents
9	Medical, education, doctor, patient, hospital	Medical
10	One Belt, One Road, Silk Road, Digital, Initiative	The Belt and Road Initiative
11	Culture, justice, reform, socialism, institution	Judicial Reform
12	Government, digital, declaration, western, city	Digital government
13	Government affairs, resources, sharing, informationization, unification	Sharing and informationization of government resources
14	Network, sharing, cycling, 5g, wisdom	Bike sharing, 5g network
15	Manufacturing, industry, investment, service industry, scale	Manufacturing, service industry, industrial investment scale
16	Medical equipment, transfer, military and civilian, perfect, mechanism	Improve the military and civilian medical equipment transfer mechanism
17	Government affairs, administration, integration, autonomous region, office	Government integration
18	Planning, transportation, intelligence, collaboration, support "	Intelligent traffic planning
19	Ethnicity, evaluation, clinical, resources, standards	Evaluation of clinical resource standards
20	ai, voice, machine, recognition, mobile	Cell phone speech recognition
21	Manufacturing, Design, Investment, Advanced, EU	Design and investment in advanced manufacturing
22	City, baidu, wisdom, planning, open	Planning a smart city
23	City, space, wisdom, security, crowd creation	Security in smart cities
24	Informatization, industry, human resources, demonstration, manufacturing	Manufacturing, industrial human resource informatization
25	Talent, technological innovation, transformation, scientific and technological achievements, achievements	Transformation of scientific and technological achievements
26	Smart, logistics, business, intelligent, industrial	Industrial intelligence
27	People, SMEs, openness, trade, politics	SME trade
28	Agriculture, digital, digital, statistics, transformation	Digital Transformation of Agriculture
29	Reform, employment, policy, system, government	Reform employment policy
30	ai, machine, algorithm, express, Tencent	Tencent's algorithm in the ai field
31	Wealth, funding, internet, science, plan	Science Grant Program on the Internet
32	Registration, reform, no one, rules, regulations	Standardize reform rules
33	Physical, digital, high quality, experience, revitalization	Physical revitalization

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From Table 2-2017 results, we can see that compared with 2016, finance, manufacturing, and service industries are still the key issues in the field of artificial intelligence. The application of artificial intelligence in manufacturing and service industries is strengthened to realize the transformation of scientific and technological achievements. It is very important. The problem of "talent" in the field of artificial intelligence is also becoming more and more important. "5g" networks, agricultural transformation, and speech recognition have become the new focus of attention in 2017, and in 2017, different achievement transformation products have been achieved. In the agricultural field, In 2017, a peach farmer in Pinggu District, Beijing, using artificial intelligence technology to develop a large peach sorting machine, realized the function of the machine to sort peaches. Yi Lieyun and others designed a set of intelligent automated pig feeding systems to achieve timing and quantitative The feeding function can not only avoid waste of resources and improve the production performance of pigs. Speech recognition technology has also been applied to the medical field. Guangzhou Military Region Hospital uses speech recognition technology to reduce time and improve efficiency. It shows that artificial intelligence is focused on mobile phones. The technology of speech recognition is realized, but it can be developed and applied in many fields.

From the theme identification results in Table 3-2018, we can see that the main focus of artificial intelligence has shifted this year, from the previous financial and medical health to smart tourism and "The Belt and Road Initiative". Compared to 2017, the importance of "The Belt and Road Initiative" There have been great changes in sexuality. President Xi Jinping proposed at the first "The Belt and Road Initiative" International Cooperation Summit held in 2017: "We must adhere to innovation-driven development and strengthen our efforts in the frontiers of digital economy, artificial intelligence, nanotechnology, quantum computers, etc. Cooperation to promote the construction of big data, cloud computing, smart cities, and the connection to the 21st Century Digital Silk Road. "During the year of 2018, we followed the instructions of General Secretary Xi to build an open and shared artificial intelligence platform. In many developing countries, China is expected to become a leader in artificial intelligence competition, allowing the "artificial intelligence dividend" to provide strong momentum for the construction of "The Belt and Road Initiative" [21]. In 2017, "5G networks" appeared in the list of national development. In 2018, China seized the momentum and further emphasized the importance of 5G networks, including "Experiencing 5G", "5G Boosts Network Speed" and so on. "Reducing Taxes" also became the focus of 2018. turn offIt has also become a major focus of research to improve the future intelligent tax legal system.

The results of the theme recognition in 2019 are shown in Table 4. Compared with the previous three years, the focus of the theme recognition in 2019 has shifted. In the past few years, artificial intelligence was more inclined to some existing field knowledge, emphasizing the application of artificial intelligence, and in In 2019, artificial intelligence is more inclined to basic research. Starting from chips and networks, vigorously develop artificial intelligence.First, the scientific and technological transformation achievements of artificial intelligence have become the most concerned topics.Machine products include home robots, intelligent robots, and various applications. Industry. The tracking and interaction strategy proposed by Wang Hongmin can realize the tracking and intelligent interaction of target robots by intelligent robot mice. This research can not only provide references for biologists and other related scholars, but also the results of scientific and technological transformation can be used to track target objects. Complete tracking and detection of target objects. Secondly, the ranking of "5g network" is higher than last year, and Huawei took the lead in completing the development of 5g network in 2019, laying the foundation for the rapid development of China's network.

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Table 3. -2018 theme identification

theme	Key words	Subject description
1	Tourism, Yangtze River Delta, city, tourists, wisdom	Wisdom Tourism
2	One Belt, One Road, Co-construction, Along Lines, Initiatives	The Belt and Road Initiative
3	Government affairs, service platform, region, unity, government	Government Service Platform
4	Digital, information, network security, network, governance	Cyber Security Governance
5	Entrepreneurship, entrepreneurship, incubator, results, incubation	Entrepreneurship
6	Robotics manufacturing industry manufacturing manufacturing	manufacturing
7	Education, teacher, student, school, teaching	education
8	Talent, specialty, university, discipline, talent training	talent development
9	Reform, tax reduction, taxation, declaration, reduction	Reduce taxes
10	Health, medical, hospital, patient, doctor	Medical
11	ai, speech, machine, recognition, scene	Speech recognition scene
12	Consumption, growth rate, first half, income, decline	Higher consumption and lower income
13	Satellite, ecological environment, pollution, garbage, construction	ecosystem
14	Lab, cloud, collaboration, resources, chips	Resource collaboration
15	Investment, finance, culture, funds, capital	financial
16	Intellectual property, filing, patent, unit, examination	Intellectual property
17	Car, driving, transportation, auto, travel	Autopilot
18	Industry, manufacturing, manufacturing, cultivation, service industry	Manufacturing and service industry cultivation
19	Robot, spain, 5g, ali, experience	Experience 5g
20	Network, production, traffic, 5g, speedup	5g speed up
21	Consumers, customs, customs, e-commerce, shopping	E-commerce
22	Production, Recommendation, Agriculture, Farmer, Video	agriculture
23	High-speed rail, railway, reconstruction, early warning, disaster prevention	Railway disaster prevention
24	Quality, standard, level, guarantee, policy	Quality Standards Policy
25	Unmanned, logistics, private enterprise, drone, private	Private enterprises, drones

3.2. Calculation Results 0f Research Frontier Theme Indicators

In the previous article, we have obtained the annual theme results. Due to the large number of themes, we will mainly select the topics that appear more frequently to determine the results. The results are shown in the following table:

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Table 4. Theme identification in 2019

theme	Key words	Subject description
1	ai, robot, machine, profession, knowledge	Machine expertise
2	Education, urban, modernization, talent, planning	Urban planning, modern talents
3	Industrial, 5g, digital, network, production	Digital industry, 5g network
4	Chip, ai, computing, intel, agriculture	chip
5	Medical, ai, storage, diagnostics, business	Medical storage and diagnostics
6	Digital, culture, tourism, marketing, city	Digital city (culture, tourism)
7	Education, teacher, school, village, profession	Rural education
8	Employment, reform, electronics, trade, standards	Reforming e-commerce standards
9	Robot, auto, ecology, scene, driving	Machine autonomous driving scene
10	One Belt, One Road, Education, Co-construction, Hospital	The Belt and Road Initiative
11	Consumption, investment, manufacturing, finance, automotive	Manufacturing, financial investment
12	Occupation, Risk, Reform, Improvement, Evaluation	Occupational risk
13	Intellectual property, farmers, agriculture, governance, institutions	Agricultural Intellectual Property Governance
14	Entrepreneurship, Science Park, University, Senior Care, College	ai places
15	Entrepreneurship, city, reform, talent, culture	Urban Reform and Talent
16	High speed, production, science, traceability, monitoring	Production inspection
17	Reform, mechanism, support, manufacturing, high quality	Manufacturing mechanism

Among them, the threshold of emerging degree is 0.50, and the threshold of attention is 0.262. Among them, the determination of the threshold is based on the two-eight law, which sorts the emerging degree and the degree of attention of all topics separately, and selects the top 20% value as the threshold. The topics are divided into different topic categories based on the discrimination results.

There are 9 emerging themes, including "5G network", "chip", "storage", "algorithm", "digital city", "college", "entrepreneurship", "legislation" and "agriculture". First, "5G "Network" became a hot topic for the first time in 2017, and the attention has been increasing with time. From 0.038 in 2016 to 0.181 in 2019, the attention level has increased by 4 times, and Huawei has taken the lead in implementing 5G networks. Laid the foundation for China to become an information-based powerhouse. The advent of 5G will inevitably promote the development of artificial intelligence and accelerate the pace of transforming science fiction into reality. Second, "chips" have also become a new hot spot in the field of artificial intelligence in the past two years. May 9 On the day, the artificial intelligence company Yitu Technology launched its first deep learning cloud custom SoC (System-on-a-Chip, or "system on chip") chip questcore ™ (question, which officially announced its entry into the AI chip. "Algorithms" and "chips" are closely related. As the founder of Yitu Technology said, the development of artificial intelligence will open a new era-the era of algorithms and chips. It is worth noting that the "artificial intelligence legislation" has gradually become The focus of these years, the development of

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202003_6(3).0035

artificial intelligence will inevitably lead to aThe social effects of the series, machines gradually replaced labor, causing an increase in unemployment, which will inevitably impact the employment structure. On May 16, 2019, the third section of the smart conference was held, and the conference established the "Artificial Intelligence Rule of Law and Rule of Law Guarantee" forum. Building a legal system to improve the development of artificial intelligence.

Table 5. Calculation results of leading-edge subject indicators

Subject	Emergence				Attention			
	2016	2017	2017	2019	2016	2017	2018	2019
Medical	1	0.75	0.50	0.25	0.279	0.301	0.236	0.296
financial	1	0.75	0.50	0.25	0.290	0.282	0.243	0.262
manufacturing	1	0.75	0.50	0.25	0.284	0.199	0.173	0.01
Service industry	1	0.75	0.50	0	0.212	0.110	0.098	0.090
Talent	1	0.75	0.50	0.25	0.284	0.265	0.353	0.295
unmanned	1	0.75	0	0	0.099	0.098	0.088	0.062
E-commerce	1	0	0.75	0	0.139	0.075	0.058	0.048
5G	0	1	0.75	0.50	0.038	0.054	0.076	0.181
Shuangchuang	1	0.75	0.50	0	0.158	0.082	0.055	0.053
Intellectual property	1	0.75	0.50	0.25	0.113	0.099	0.098	0.102
education	1	0.75	0.50	0.25	0.223	0.231	0.308	0.309
Entrepreneurship	0	1	0.75	0.50	0.429	0.290	0.225	0.200
Drone	0	0	1	0	0.118	0.082	0.058	0
Transformation of scientific and technological achievements	0	1	0	0	0.043	0.035	0.035	0.038
Speech Recognition	0	1	0.75	0	0.035	0.077	0.063	0.055
traffic	1	0.75	0.50	0	0.185	0.214	0.205	0.208
Smart City	0	1	0.75	0	0.094	0.086	0.068	0.069
robot	0	0	1	0.75	0.365	0.345	0.325	0.269
industry	1	0.75	0.50	0.25	0.453	0.353	0.333	0.298
ecosystem	0	0	1	0	0.054	0.053	0.040	0.049
agriculture	0	1	0.75	0.50	0.105	0.127	0.108	0.139
storage	0	0	0	1	0.062	0.043	0.038	0.071
College	0	0	1	0.75	0.126	0.103	0.153	0.137
Digital city	0	0	0	1	0	0.002	0.003	0.003
tax	0	0	1	0	0.062	0.035	0.040	0.051
legislation	0	1	0.75	0.5	0.027	0.031	0.025	0.037
chip	0	0	1	0.75	0.086	0.127	0.100	0.137
algorithm	0	1	0	0.50	0.051	0.145	0.142	0.163
Technological innovation	0	1	0	0	0.190	0.137	0.146	0.126
cyber security	0	0	1	0	0.064	0.056	0.058	0.060

The cutting-edge themes include only one "robot". In recent years, the wave of "robots" has set off. Both the application research of robots and the research on the functional design of

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202003_6(3).0035

robots have achieved unprecedented development. There are five hot topics, including "medical "," "Finance", "talent", "education" and "industry". Talent training in the field of artificial intelligence has been the focus of development in recent years. Various universities have actively invested in the development of artificial intelligence. Tsinghua University has established an artificial intelligence school. Class [22] .Xi'an Electronic Science and Technology University established the Artificial Intelligence Academy to actively promote the deep integration of artificial intelligence and education, and vigorously cultivate artificial intelligence talents to promote the rapid development of artificial intelligence.

4. MAIN RESEARCH CONCLUSIONS

This article studies the hot topics in the field of artificial intelligence in the past 4 years, uses the lda topic model to explore research hotspots in the field of artificial intelligence, and uses emerging and attention indicators to divide the topics into emerging topics, cutting-edge topics, hot topics, and Decline the theme and analyze the evolution results of the theme. Not only draw the focus of artificial intelligence in each year, understand the evolution path of artificial intelligence, and further summarize and organize according to the development hotspots of artificial intelligence in recent years, and then predict the artificial intelligence field. In order to promote the rapid development of artificial intelligence, grasp the development trend of artificial intelligence, and consolidate China's position in the development of science and technology, based on this, this article makes several suggestions:

(1) Focus on the development of emerging topics in the field of artificial intelligence. Currently there are 9 emerging topics in the field of artificial intelligence. They include "5g network", "chip", "storage", "algorithm", "digital city", "university", "Entrepreneurship", "legislation" and "agriculture". Since the emerging topics are areas and directions that the country will focus on in recent years, we must keep up with national development trends and strengthen the "5g network" and artificial intelligence fields. Cooperation to accelerate the pace of artificial intelligence development, strengthen basic research in the field of artificial intelligence, that is, improve the performance of chips, storage, and algorithms. Create a digital city and expand the scope of entrepreneurship in the field of artificial intelligence.

(2) Continuously improve the speed of transformation of research results in the field of artificial intelligence. In the subject discrimination results, "robots" have become the only cutting-edge topics in the field of artificial intelligence. Robots have developed rapidly in recent years. We must grasp the trend and accelerate the achievements of artificial intelligence technology. The speed of transformation, the development and application of robots have changed the development of some traditional industries, improved the quality of people's lives, and improved people's work efficiency. We must continue to deepen the integration of artificial intelligence and "robots," and make artificial intelligence new. The technology is applied to the design of "robot" research.

(3) Broaden the field of cooperation between the field of artificial intelligence and hot topics. Hot topics include "medical", "finance", "talent", "education", and "industry". In recent years, from Table 1 to Table 4, artificial intelligence The development trend in recent years, we know that from the application of artificial intelligence in 2016 to independent research and development in 2019, our development direction has shifted.China has gradually transformed from traditional industry to digital industry.At the same time, artificial intelligence has been applied to the medical field. The focus has never changed. Therefore, we will continue to broaden the cooperation between artificial intelligence and other industries to increase the development speed of the industry.

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202003_6(3).0035

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