

HotSpots and Trends in Spatial Research on Historic Neighborhoods in China

-- Based on CiteSpace Visual Knowledge Graph Analysis

Danni Zha

College of School of Tourism (Institute of Human Geography), Xi'an International Studies University, Xi'an, China

ABSTRACT

Historic districts are the carriers of urban memory, which not only carry rich historical and cultural information, but also are an important manifestation of national identity and cultural diversity. In recent years, the spatial research of China's historic districts has gradually become a hotspot of academic attention. In order to explore the hotspots and trends of the spatial research of China's historic districts, this paper takes the literature included in the China Knowledge Network from 2004 to 2024 as the data base, searches with the keywords of "historic districts" and "space", and conducts visualization and analysis by using the CiteSpace software was used for visualization and analysis. It is found that: ①The annual publication volume of the research on the space of historic districts in the past two decades shows the characteristics of rising and fluctuating, and the research institutions are mainly concentrated in colleges and universities. ②In terms of research stages, it has mainly experienced three stages: the starting stage, the emergence of new research trends and directions, and the people-oriented stage. ③There is a lack of comparative analysis of research objects and fewer quantitative research methods. Based on this, this paper puts forward the research outlook, with a view to providing certain reference and reference for the spatial research of historical neighborhoods through the research results of this paper.

KEYWORDS

Historic Districts; CiteSpace; Research Hotspots; Visualization and Analysis.

1. INTRODUCTORY

In the wave of globalization and urban modernization, historic districts, as unique spaces carrying urban memory and cultural genes, are facing unprecedented challenges and opportunities. On the one hand, rapid urban development is threatening the original appearance of historic districts and the survival of cultural heritage. On the other hand, the deepening of people's understanding of the value of cultural heritage and the emphasis on cultural self-confidence have prompted us to seek more scientific and rational ways to balance the needs of historical heritage and modern life. In this context, the study of historic district space has become the focus of interdisciplinary attention, involving architecture, urban planning, sociology, economics and even tourism. The study of historic district space has important theoretical value and practical significance. At the theoretical level, through the study of historic district space, we can gain a deeper understanding of the law of urban spatial development and reveal the mechanism of urban cultural evolution. At the practical level, the research

results can provide a scientific basis for the protection and development of historic districts and guide the practice of urban planning and construction.

In recent years, with the development of big data and information visualization technology, bibliometric analysis tools such as CiteSpace have provided a new perspective for historic district research, which not only reveals the knowledge structure, thematic evolution, and academic lineage of a certain research field, but also identifies the research hotspots and potential cutting-edge trends, which provides scholars with an effective means to understand the dynamics of the field. By constructing a knowledge map, CiteSpace helps us understand the key concepts, core documents and important authors in the study of historic districts, which in turn provides decision support and research guidance for related research. The purpose of this study is to use CiteSpace as a visual analytical tool to conduct in-depth excavation and analysis of the literature on spatial research on Chinese historic districts, with a view to revealing their research hotspots, evolutionary trajectories and future trends. Through quantitative analysis of the relevant literature, we explore the main issues and research methods at different stages, and identify possible innovations and research gaps, with a view to providing empirical evidence and theoretical guidance for the study of historic district space in China.

2. RESEARCH METHODS AND DATA COLLECTION

2.1. Research Methodology

CiteSpace is a software tool for scientific bibliometrics and knowledge mapping analysis, which is able to reveal the knowledge structure, research hotspots, collaborative networks, development trends, and other information in the subject area by visualizing and analyzing the literature data. In this paper, CiteSpace 6.1.6.rar is used as an analytical processing tool to quantitatively analyze the collected literature related to the spatial research of domestic historic districts. On this basis, the important literature at each stage is intensively read and analyzed in order to sort out the research hotspots and future research trends of China's historical neighborhood space research.

2.2. Data Sources

This paper searched the China Knowledge Network (CNKI) database with the keywords of "historic district" and "space" on May 8, 2024, with the time span of 2004-2024, and the search category of all literature. A total of 2215 relevant results were retrieved, excluding conference and newspaper studies as well as studies unrelated to this paper, leaving 1978 results. A variety of literature types were included, including academic journals, research papers, and conferences. All literature was exported in Refworks format to CiteSpace software for visualization.

3. OVERALL ANALYSIS

This paper presents a preliminary overall analysis of the studies related to the spatial study of historic districts collected based on the China Knowledge Network (CNKI) database. The overall analysis mainly includes three aspects, namely, the number of annual publications, publications, and the distribution of research institutions.

3.1. Volume of Articles Issued in the Last Two Decades: Phased Upward, Fluctuating Growth

The number of annual papers with the research theme of "historic district" and "space" shows a certain stage. Using CiteSpace to analyze the trend of annual publications, the results are shown in Figure 1. The amount of literature issued on the spatial research of historical neighborhoods can be mainly

divided into three stages: the first stage is 2004-2015, in the budding exploration stage, the amount of literature issued during this period of less spatial research on historical neighborhoods has just started, and the amount of literature shows a slow upward trend; the second stage is 2016-2020, in the period of rapid development, and the heat of the research during this period shows a wave of upward trend; the third stage is 2021-2024, in a period of continued growth, the number of publications in this period shows a trend of yearly growth. Overall, the spatial research on historic districts shows an upward trend in the number of articles from 2004 to 2024. The overall increase in the number of articles shows that the research system of "Historic Neighborhood Spatial Research" has been gradually formed and tends to be perfected, and that Historic Neighborhood Spatial Research is still a hot topic at present.

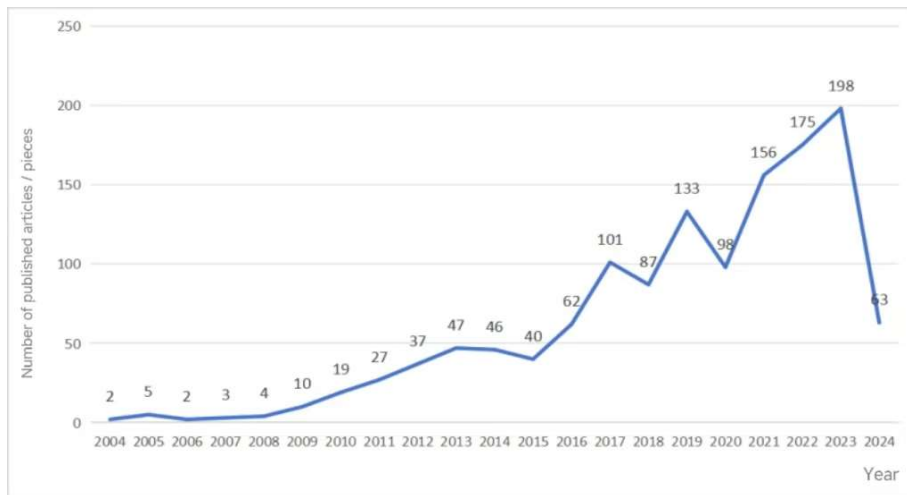


Fig. 1 Annual number of papers published on the theme of "Historic District" and "Space" in CNKI search.

3.2. Analysis of Research Institutions

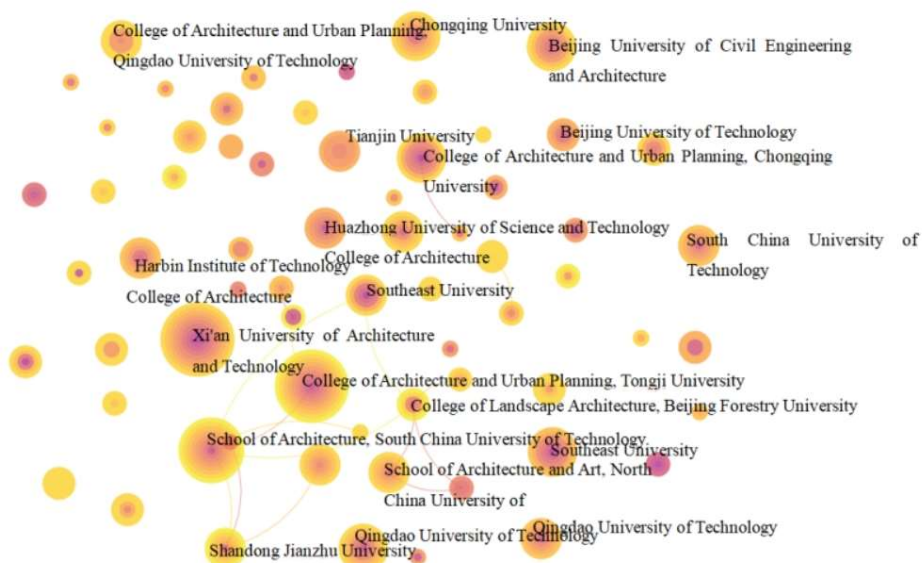


Fig. 2 Co-occurrence mapping of domestic partner organizations

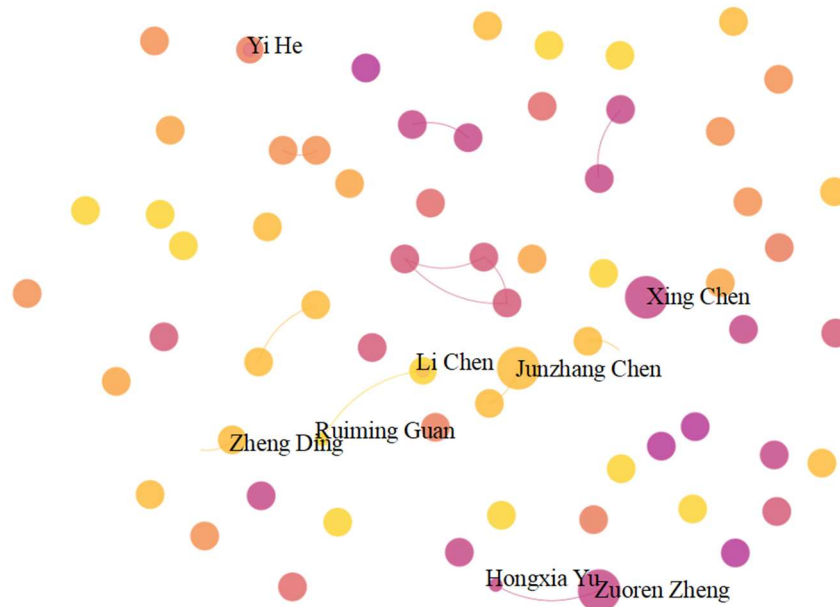


Fig. 3 Collaboration of authors of publications

Through CiteSpace analysis, it is concluded that at present, the spatial research on historical neighborhoods in China is dominated by universities, and the top 5 universities in terms of the number of published articles are: Xi'an Architectural University of Science and Technology (68 articles), School of Architecture of Southeast University (34 articles), Qingdao University of Technology (33 articles), Beijing University of Architecture (28 articles), and Tongji University (26 articles). As can be seen from Figure 3, there is less connection between the authors of historical neighborhood space research, and the main research teams include: Ruiming Guan's team from Fuzhou University, Fengwen Wu from Beijing Institute of Technology, and Yi He from Huazhong University of Science and Technology. It can be seen that the research teams of China's historical neighborhood space research have low cooperation and association with each other, presenting the characteristics of overall dispersion.

4. HOTSPOTS AND EVOLUTIONARY TRENDS OF SPATIAL RESEARCH ON HISTORIC NEIGHBORHOODS

4.1. Analysis of Research Hotspots

Keywords are a high degree of summarization of the topic of the paper, which can reflect the core idea and main content of the article. In this paper, we select the representative 1978 papers from all the literature after searching. Utilizing the keyword path calculation method of CiteSpace, the time slice is set to 1 year, and the keyword co-occurrence mapping in Fig. 4 is obtained. The size of the nodes in the mapping represents the frequency of keyword occurrence, and the high-frequency keywords represent the research focus in the field. The thickness of the lines indicates the degree of connection between the keywords. There are 633 keyword nodes and 1502 connecting lines in Fig. 4, with a density of 0.0075. According to the keyword co-occurrence map in Fig. 4, it can be seen that the spatial morphology of historic districts, preservation and renewal, spatial characteristics and spatial vitality are the focuses of the research, meanwhile, the public space and urban regeneration are the important backgrounds of the research on the spatial study of historic districts, and the spatial syntax is an important means of spatial research on historic districts.

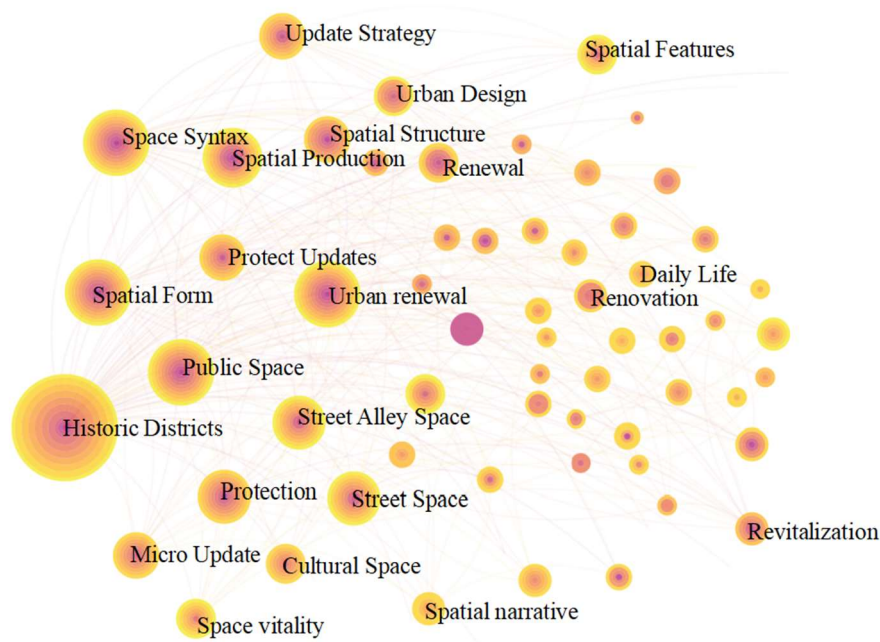


Fig. 4 Keyword co-occurrence knowledge map for spatial research on historic neighborhoods, 2004-2024

4.2. Analysis of Research Trends

By studying the frontiers of spatial research in historic districts, it is possible to recognize the development trend and the latest research trends in this field. By extracting the emergent words through CiteSpace, the top 17 prominent keywords in terms of intensity were selected (Figure 5).

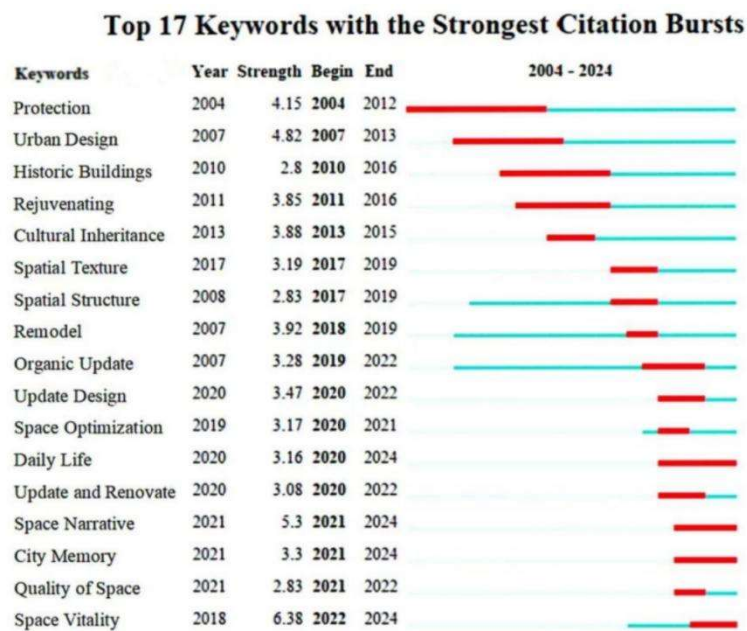


Fig. 5 Knowledge map of keyword emergence for spatial research on historic neighborhoods

Through the emergent word mapping, it can be seen that in recent years, the one with higher emergence degree is spatial vitality, which starts in 2022 and lasts until 2024, indicating that spatial vitality has become a hot topic in recent years. By analyzing the emergent word mapping and the keyword clustering time zone knowledge map, the spatial research of historic districts can be divided into three phases from a temporal point of view: the first phase (2004-2016) "conservation" "urban design" "historic buildings", "vitality revitalization", "cultural heritage" and other keywords appear prominently, the main object of attention in this period is the protection and revitalization of historic districts; In the second phase (2017-2020), "spatial space" is the main object of attention; in the second phase, "spatial space" is the main object of attention. keywords such as "spatial texture", "spatial structure", "transformation", "organic renewal" and other keywords appear prominently, indicating that the main object of attention in this period is the spatial transformation and organic renewal aspects of the historic district. In the third phase (2021-2024), keywords such as "spatial narrative", "urban memory", "spatial quality", "spatial vitality" and other keywords emerge. With the deepening of the research, the spatial study of historic districts is constantly moving towards refinement and complexity, and the spatial study on historic districts will be paid more attention by scholars in the future.

4.2.1. Phase I: Start-up Phase (2004-2016)

In 1994, the Requirements for the Preparation of Protection Plans for Famous Historic and Cultural Cities was issued, defining the concept of "historic district". After that, the Law of the People's Republic of China on the Protection of Cultural Relics and the Measures for the Management of Urban Purple Lines were issued one after another, which clarified the scope of protection of historic and cultural districts and historic buildings, and provided direction guidance and legal guarantee for the protection of historic and cultural districts. Domestic research on historic districts has begun to shift from a macro perspective to a micro level research on the protection and revitalization of historic districts. Studies on the renewal and protection strategies of historic districts from a spatial perspective have begun to appear. For example, Zhang Zhibin and Zhang Qi used the Wuxi Xiaolouxiang Historical and Cultural Neighborhood as a research case to explore the cultural continuity and vitality regeneration of the historical and cultural neighborhood from a spatial perspective^[3]. Wang Chengfang and Sun Yimin used GIS analysis and spatial syntax method to explore the planning method of protection and renewal of historical neighborhoods in Jiangmen City as an example, combined with field research^[4]. Based on the spatial production theory, Wang Min and Zhao Meiting studied the changes of urban form and social structure in the process of flexible and autonomous revitalization of Guangzhou Overseas Chinese New Village, and put forward the countermeasure suggestions for flexible and autonomous revitalization of the historic district^[5]. Yao Di and Dai Desheng summarized the current situation of the protection of historic districts in China, evaluated the current research and practice of intangible culture-related protection, pointed out some problems and shortcomings, and put forward the viewpoint that the future development direction of the protection of historic districts must be shifted from spatial transformation to value remodeling. It also puts forward the view that the future development direction of historic district protection must shift from "spatial transformation" to "value remodeling"^[5].

4.2.2. Phase 2: Emergence of New Research Trends and Directions (2017-2020)

Along with the implementation of urban renewal policies and the further development of urban renewal-related research, a new research trend has emerged in the spatial study of historic districts, which has shifted from protection and revitalization in the previous stage to spatial transformation and organic renewal of historic districts. For example, Wang Qingge explored the renewal of historic districts from the perspective of spatial justice theory, and put forward countermeasure suggestions such as equal and effective participation of all subjects in the renewal of historic districts, and balanced and effective multi-dimensional cooperative actions of the participating forces^[7]. Zhu Zhaolin and Wang Qingge discussed the renewal of historic districts based on the renewal experiment of Yangmeizhu Xiejie from the perspective of spatial production theory^[8]. Zhang Yuyang and Yang

Changming et al. divided the spatial dynamics of historic districts into three types: continuation, reconstruction, and expansion based on the evolutionary logic of historic district development, and analyzed these three types based on the case study analysis, which provided an important basis for the renewal of historic districts^[9]. Using Nanjing Lotus Pond as a research case, Chunxia Zhang and Weimin Zeng adopted a parametric method to interpret the spatial texture of the historic district, which verified the feasibility of the parametric method in the spatial texture reconstruction of the historic district^[10]. Sun Fei explores the logic of historic district renewal in the process from spatial production to spatial experience by taking the historic district of Shanghang in Fuzhou as a research case^[11]. Based on the theory of urban catalyst, Shen Xiao explored the morphology, renewal mechanism, renewal process, and renewal effect of public space in historic districts under the theory of catalyst, and based on this, he proposed an organic renewal strategy of public space in historic districts as an urban catalyst^[12]. Based on the perspective of complex network theory, Jianwen Huang and Xuemei Zhu et al. constructed a network effectiveness evaluation model of public space in historic districts with Changti Historic District in Jiangmen City, Guangdong Province, and analyzed the impact of micro-renewal in historic districts on the overall effectiveness of the public space system^[13].

4.2.3. Phase III: People-centered (2021-2024)

With the improvement of residents' material living conditions, they began to pay attention to the improvement of the quality of living environment. During this period, the research perspective began to shift to people-oriented, and the research content shifted from spatial structure and spatial remodeling to spatial memory, spatial quality and vitality, and the research object shifted from macroscopic to microscopic scales such as residential space and street space.

For example, Xiong Yao and Yan Yan took Gaochun Old Street in Nanjing as a case study, used the correlation between physiological equivalent temperature (PET) and microclimatic factors to conduct a study on human thermal comfort, and proposed a five-point optimization strategy regarding the spatial pattern of Jiangnan historical neighborhoods based on the thermal sensation of the human body in different spatial patterns^[12]. Feng Yan and Li Jinjie constructed the impact assessment index of historical neighborhoods based on the synergistic perspective of people and space from the perspective of environmental value, historical value and social value, and formed an assessment method of the impact of historical neighborhoods with local characteristics^[15]. Zhang Chunming and Cai Xinjun et al. quantitatively assessed the spatial quality of the historic district of Dokuzong Ancient City in Shangri-La City, Yunnan Province, by using manual self-collection of streetscapes, and put forward strategies to improve the response^[16]. Based on the spatial production theory and residents' subjective perspective, Guan Yongkang and Hou Yingyu et al. explored the driving mechanism and the root of the problem of residents' spatial production practice before and after the renovation of the historic district through non-participatory observation and in-depth interviews, and put forward suggestions in terms of theoretical guidance, methodological strategies, and spatial governance, which provide a reference to the study of the spatial power of the aboriginal inhabitants in the renovation of the historic district^[17]. Zhou Mengru and Wei Hanbin et al. took the spatial walking environment of Shichahai historical and cultural district in Beijing as a case study, constructed a walking environment evaluation system, used the mean square deviation weight method to give weights to the indicators and calculated the comprehensive score for classification, and finally came up with the planning suggestions of banning stopping and restricting traffic, optimizing the road cross-section, and increasing greenery to improve the spatial walking quality of the street space in the Shichahai area^[18].

5. CURRENT STATUS OF SPATIAL STUDIES OF HISTORIC NEIGHBORHOODS

By analyzing the literature related to the spatial study of historical neighborhoods in the China Knowledge Network database, this paper summarizes the main features of the spatial study on historical neighborhoods: (1) The spatial study of historical neighborhoods is showing a rapid development trend, with the heat going from a plateau to a continuous enhancement. This phenomenon shows that more and more researchers pay attention to the spatial research of historical neighborhoods, and the research perspective gradually shifts to people-oriented. (2) The spatial research of historic districts shows a diversified trend. At present, China's research on historic districts has already possessed abundant research results, and the content of the research has deepened from the appearance of the district and the protection and renewal to the cultural inheritance and vitality enhancement, etc. The research content of the spatial research on historic districts is also diversified. The spatial research on historic districts mainly focuses on spatial morphology, spatial characteristics, protection and renewal, and the spatial vitality and spatial quality of historic districts have been the hot topics of research in recent years. In terms of research methods, spatial production theory and spatial syntax are the main ones, with more literature on qualitative analysis and less but gradually increasing literature on quantitative analysis. (3) Lack of comparative analysis. There are abundant research cases on spatial research of historical neighborhoods, but most of them usually choose a single case for the research object and lack comparative analysis between the same and different types of research objects. Different regions in China have great differences in history and culture, natural environment and policies and regulations, so it is important to select the same type or different types of cases for comparative analysis.

6. SUMMARY AND OUTLOOK

6.1. Review of the Current Situation

This paper systematically analyzes 1978 documents on spatial research of historical neighborhoods in China from 2004 to 2024 by using bibliometric methods through CiteSpace Knowledge Graph. The study shows that (1) from the perspective of time, the number of publications on the spatial research of China's historical neighborhoods is characterized by rising stages and fluctuating growth. (2) From the perspective of cooperation network, the research teams and disciplines present diversified characteristics, but the research teams have a low degree of cooperation and association with each other, and the whole is characterized by fragmentation. (3) The keyword co-occurrence map shows that "spatial morphology", "conservation and renewal", "spatial characteristics" and "spatial vitality" are the keywords in this field. and "spatial vitality" are the high-frequency keywords in this field at present.

6.2. Outlook

(1) Innovation of research methods. In the era of big data, high-tech support has become a new research trend. The spatial research on historical neighborhoods is dominated by qualitative research, with insufficient attention paid to quantitative methods. Quantitative analysis is mostly analyzed by spatial sentence method and GIS technology, and qualitative analysis is mostly analyzed by questionnaire survey, field research, literature reading and other methods. In the future, it is necessary to focus on the innovation of research methods in this field, strengthen the use of quantitative analysis methods, and combine qualitative analysis with quantitative analysis to enhance the scientific nature of spatial research on historic districts.

(2) Innovation of research object. The selection of cases for spatial research on historic districts is characterized by homogenization, and there are fewer studies of comparative analysis of multiple

cases across regions and cultures. Therefore, in the future, spatial research can select multiple research cases for comparative analysis, so that cross-cultural and regional research results can be derived.

(3) Collaborative institutional innovation. There are a lot of achievements in spatial research on historic districts, but there is a lack of cooperation among research institutions and authors. In the future, research institutions and authors can strengthen cooperative ties through resource sharing and joint research projects, so as to enrich the research results of spatial research on historic districts from a multidisciplinary perspective and by adopting a variety of research methods.

REFERENCES

- [1] Li Ying. Research hotspots and trends of spatial morphology of Chinese historic districts - A visualization analysis based on CiteSpace[J]. *Urban Architecture*,2023,20(13):72-77+97.
- [2] Zeng Dejie,Yang Li. Visualization and analysis of tourism research on historical and cultural districts based on CiteSpace[J]. *Science and Technology Communication*,2023,15(05):93-96.
- [3] ZHANG Zhibin,ZHANG Qi,TAO Tao. Spatial Maintenance and Remodeling of Wuxi Xiaolouxiang Historical and Cultural Neighborhood[J]. *Modern Urban Research*,2010,25(08):34-40.
- [4] WANG Chengfang,SUN Yimin. Research on the planning method of protection and renewal of historical neighborhoods based on GIS and spatial syntax--Taking the historical neighborhoods of Jiangmen City as an example[J]. *Tropical Geography*,2012,32(02):154-159.
- [5] Wang Min,Zhao Meiting. Autonomous Revival of Historic Neighborhoods under the Perspective of Spatial Production--Taking Overseas Chinese New Village in Guangzhou as an Example[J]. *Journal of South China Normal University (Natural Science Edition)*,2015,47(02):124-133.
- [6] YAO Di, DAI Desheng. From "spatial transformation" to "value remodeling" - A study on the turn of protection strategy of historic districts[J]. *Journal of Architecture*,2011(05):36-39.
- [7] Wang Qingge. Research on the renewal of historical neighborhoods under the perspective of spatial justice [D]. Shandong University,2018.
- [8] ZHU Zhaolin,WANG Qingge. Renewal of Historic Neighborhoods in the Perspective of Spatial Production Theory[J]. *Dongyue Lecture Series*,2018,39(03):173-179.
- [9] ZHANG Yuyang, YANG Changming, JIA Ziyu. Implications of "historical dynamics" for spatial restoration of contemporary historic neighborhoods[J]. *Journal of Architecture*,2018(S1):161-167.
- [10] ZHANG Chunxia, ZHANG Weimin, XIE Jinzhi, WANG Wenguang. Spatial Texture Reconstruction of Urban Historic Neighborhoods Based on Parametric Techniques--Taking Nanjing Lotus Pond as an Example[J]. *Decoration*,2019(03):80-83.
- [11] SUN Fei. From spatial production to spatial experience:A logical examination of the renewal of historical and cultural neighborhoods[J]. *Dongyue Lecture Series*,2020,41(07):149-155.
- [12] Shen Xiao. Research on Organic Renewal of Public Space in Historic Neighborhoods Based on Urban Catalyst Theory [D]. Jiangnan University:2022.
- [13] HUANG Jianwen,ZHU Xuemei,ZHANG Weiguo. A preliminary analysis of the effectiveness of micro-renewal in historical neighborhoods under the perspective of complex network theory--Taking Jiangmen Changdi Historical Neighborhood as an Example[J]. *Urban Development Research*,2019,26(01):1-7.
- [14] Xiong Yao,Yan Yan. Research on the spatial pattern of Jiangnan historical neighborhoods based on human thermal comfort--Taking Gaochun Old Street in Nanjing as an example[J]. *Journal of Nanjing Forestry University (Natural Science Edition)*,2021,45(01):219-226.
- [15] Feng Yan,Li Jinjie. Research on the Construction and Application of Impact Assessment Indicators of Historical Neighborhoods under the Perspective of People-Space Synergy--Taking the Yuehe Historical and Cultural Neighborhood of Jiaying City as an Example[J]. *Planner*,2023,39(03):64-72.
- [16] ZHANG Chunming,CAI Xinjun,CHE Zhenyu. Quantitative research on spatial quality of historical neighborhoods under self-collected streetscape data[J]. *Southern Architecture*,2024(05):76-82.
- [17] GUAN Yongkang, HOU Yingyu, XUE Yi. Spatial Production of Historical Neighborhood Renovation from the Perspective of Resident Subjects--The Case of "Dangerous and Old Houses Renovation Project" in Tianjin Old Town[J]. *Human Geography*,2023,38(04):92-101.
- [18] ZHOU Mengru,WEI Hanbin,BIAN Lanchun. A study on the measurement of pedestrian environment in street space--Taking Shichahai Historical and Cultural Neighborhood in Beijing as an Example[J]. *Shanghai Urban Planning*,2021(03):74-80.

- [19] Li Ying. Research hotspots and trends of spatial morphology of Chinese historic districts - A visualization analysis based on CiteSpace[J]. *Urban Architecture*,2023,20(13):72-77+97.
- [20] Shao Shuai,Yu Pengzheng. Extension of plot texture and utilization of space in community renovation of historic districts - A comparison between Tokyo's Tanaka area and Beijing's Wudaoying Hutong neighborhood[J/OL]. *Industrial Architecture*.
- [21] Ziyue Wang,Lei Liu. Research on the change of spatial morphology of urban and non-protected historical neighborhoods under the perspective of spatial syntax--Taking Hechuan Wenfeng Ancient Street Area as an Example[J]. *Journal of Southwest University (Natural Science Edition)*,2020,42(01):142-150.
- [22] YUAN Qifeng,CAI Tianlyric. Dilemmas of Historic District Renovation Based on the Perspective of Spatial Production--Taking the Historic District of Shantou Small Park as an Example[J]. *Modern Urban Research*,2016(07):68-77.
- [23] Zhang Yang,He Yi. Research Process, Characteristics and Trends of Famous Historical and Cultural Cities--An Analysis of Data Visualization Based on CiteSpace[J]. *Urban Planning*,2020,44(06):73-82.
- [24] LIN Wenliang,YUAN Anqing,ZHANG Qianqian,LIN Xinyi. Research on Knowledge Mapping for Sustainable Development of Historic Neighborhoods Based on CiteSpace[J]. *Anhui Architecture*,2024,31(01):8-10.
- [25] Zeng Dejie,Yang Li. Visualization and analysis of tourism research on historical and cultural districts based on CiteSpace[J]. *Science and Technology Communication*,2023,15(05):93-96.