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Junzhang Chen and Yile Chen

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Research on the Spatial Features of Cuiwei Historic District Based on Space Syntax

Junzhang Chen[1*] and Yile Chen[2]
1 City University of Macau, Faculty of Innovation and Design, Taipa,Macau SAR, China
2 Macau University of Science and Technology, Faculty of Humanities and Arts, Taipa, Macau SAR,China
** Corresponding Author, Email: U19091105192@cityu.mo*

Key words: Cuiwei Village, spatial syntax, historical blocks, spatial morphology

Abstract: Based on the axis analysis method, convex space method and line-of-sight analysis method in the space syntax theory, the street scale, spatial structure, and functional characteristic streets inside the Cuiwei Historic District are studied and analyzed, in order to promote the economic development of the Cuiwei Historic District and improve the villagers of Cuiwei. A sense of belonging, so as to realize the healthy development of the village and provide a feasible reference.

The research area selected the representative ancient village in the Lingnan area—Cuiwei Village in Zhuhai City. Due to the influence of multiple factors, its spatial layout around mountains and water has almost disappeared with the development and changes of the economy and society. The layout is relatively chaotic, the infrastructure is relatively old, and the natural environment has gradually deteriorated over time, making the development of Cuiwei Village far behind the pace of urban development. Based on the theory of space syntax, the Depthmap software is used to quantify the space of the streets and lanes of Cuiwei Village, and the results are analyzed.

1. HISTORIC DISTRICT

It refers to the rich natural resources and historical culture in the area, which can reflect the historical and cultural characteristics of the area. There is a certain gap between the specifications and grades of many historical buildings left in the area and the historical and cultural blocks, but they are retained to a greater extent The historical and local characteristics and the humanistic spirit and zeitgeist in the development of local economy, society and industry are more free in protection. The historical and cultural characteristics, landscape characteristics, and commercial characteristics can be preserved, and open spaces, private spaces and mixed spaces can be preserved. Type space. Judging from the current situation of village layout, Cuiwei Village's original form is "seven streets, seven miles and one lane",

and it has a layout surrounded by mountains and rivers. Clans, ancestral halls, temples and gatehouses are mixed among them. The "seven streets" of Cuiwei Village include Beizha Street, Binlang Street, Dafang Street, Changshui Street, Zhongxin Street, and Shangxia Street in the market. In Guli, Dunmuli, Renheli, "Yixiang" is Chazixiang.

With the development of society, the people's economic level continues to improve. Due to factors such as the construction of urban road administration facilities and changes in the geographical environment, the spatial layout of the villages surrounding mountains and water has been destroyed. Due to the lack of guidelines for planning and construction, early villagers spontaneously illegally rushed for construction, privately built and disorderly construction, etc., which caused the original "seven streets, seven miles and one lane" structure to be seriously damaged. The original streets, lanes, and lanes basically exist in the form of "segments" at this stage. Except for Yangzi Lane, which still retains the complete stone road and traditional streets and lanes, none of them have been preserved intact. The terrain of the village is low, and floods are prone to occur in heavy rain.

2. RESEARCH METHODS

In 1970, Professor Bill Hillier put forward the concept of "space syntax", which is about the theory of space structure and social relations. This person regards space as a part of social life, and the core theory is "space organization", which is interpreted as the concept of space in space. Combination relationship. He also authored the book "Space is a Machine-Building Fabrication Theory", which has now formed a complete system. [3]

After drawing all the roads in Cuiwei Village in CAD, put the roads drawn on the same layer, and then import the Depthmap software to analyze the space of Cuiwei site by axis method, convex polygon method, and view zone division method to obtain Cuiwei Indexes such as the connection value, control value, depth value, integration degree and travel degree of the internal road network of the village reveal the internal logic of the village’s spatial structure. The overall and local indicators in the variables can more comprehensively reflect the spatial relationship and comprehensively express the flow properties of the block space.

The software will automatically color each line according to the level of road integration, and reflect the axis diagram of the transportation network through the cold and warm changes of the color. The colder color indicates that the average function of this section of the space or the road network is lower than the average level, and vice versa. Above average. Therefore, through the color change, a better judgment is made on the connectivity and accessibility of the entire node space, and the research is conducted through the analysis of the generated graphical results, which further lays the foundation for the study of the street space morphology and spatial texture of Cuiwei Village. So as to further deepen people's understanding of research space. The specific operation method is as follows:

(1) First, based on Google Maps, after collecting the latest topographic map of Cuiwei Village, after conducting field research, establish the axis, convex polygon, and view zone segmentation models according to the corrected map, and then import the drawn axis model into Depthmap for spatial syntax Quantitative analysis, transforming village roads and urban roads into linear combinations, and statistically analyzing the generated data.

(2) Export relevant data from Table in Window in Depthmap to Excel, and then import it into SPSS19.0, and analyze the relative change degree of the obtained data, observe the mean value of X-axis and Y-axis, sample size, observe two The Pearson correlation coefficient |r| between the persons, and then generate a scatter plot, further analyze and compare to draw relevant conclusions.

3. MESO-LEVEL-SPATIAL AXIS AND HORIZON ANALYSIS OF CUIWEI HISTORIC DISTRICT

3.1 Spatial Syntactic Analysis of Cuiwei Historic District

Sort out the spatial syntax parameters and variable parameter values of the street network structure of Cuiwei Village, and show the village streets, lanes, and lanes on the map, as shown in *Figure 1-2*.

句法分析	
軸線數量	3211
平均全局整合度	0.61643
平均局部整合度	1.27401
可理解度	0.51602
平均連接度	2.44970
協同度	0.39800
全局整合度最高值	0.94136
全局整合度最低值	0.26296

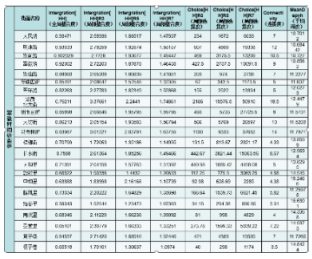


Figure 1. Spatial syntactic parameter values of Cuiwei Village street network structure
Figure 2. Spatial syntactic analysis variable parameter values of main streets in Cuiwei Historic District (partial)

3.2 Integration of Cuiwei Historic District

The observation in *Figure 1* shows that the place with the highest degree of global integration is Cuiqian Road A, which reaches 0.9413. The road section with the lowest degree of global integration is a certain trail inside the village, with the number 0.26296. Among the villages, Cuiwei Historic District Road A has the highest global integration degree, reaching 0.9019, which is the reddest place in the study area. The axis is more protruding, indicating that the road section has strong agglomeration and accessibility, and it has become a village. The main flow of people inside is a high-frequency place where the daily communication activities of local residents occur, and it also maintains a high level of vitality. Based on the map and field investigation and analysis, the left side of the road section is Mingzhu South Road, which has rich commercial layout and residential functions. There is a city rail Mingzhu station on the north and Tanzhou Town, Zhongshan on the west. There is a large flow of people and vehicles, and there is often congestion. situation. Secondly, the global integration degree of straight street and Dafang street in the market are 0.8590 and 0.8621 respectively. This street is the main crowded area of the village. In the early stage, more vendors set up stalls here. It can be seen from Baidu Time Machine that the business in this area The functions are also richer. A large number of shopping malls, shoe shops, barber shops, clothing shops, fast food shops, laundry shops, etc. are distributed along both sides of the street. Historic buildings are distributed on the right side of the straight street of the market, including Rongzhai Wugong Temple and Bi Yue Wu Gong Temple,

Mei Song Wu Gong Temple, Jinhua Temple, Guandi Temple, and Caisi Temple are located on the right side of Dafang Street, and Sanwang Temple is located on the right side of Cuiwei Street.

There is a certain gap between the numerical change of the local integration degree and the global integration degree. From *Figure 3-7*, it can be seen that, as a whole, when R=3, the regions with higher local integration degree are similar to the global integration degree. The area with the highest degree of internal local integration is at Cuiwei North Street, and the area with higher integration degree is concentrated on roads A, AA and BB. From the perspective of pedestrians, the local integration degree is higher, which can attract a large number of people. The center of the spatial structure of the entire village. Most streets and lanes in historical blocks have poor permeability and poor recognition of paths and nodes. It is difficult to stimulate the enthusiasm of external people to explore the internal environment of the block, and the degree of curiosity of the internal environment of the block is weak. As the R value increases, the area of the warmer color area gradually increases, and the color becomes more and more bright red. When R=9, the value of the local integration degree is greater than the global integration degree, and the main road is from Cuiwei Street to Dafang Street. The degree of integration has the largest value, followed by Changshui Street. The areas with cooler colors are concentrated on the east side of the main street. The area of the cold-colored areas decreases with the increase of the R value (*Figure 3*). It can be seen from Figure1 that the global average integration degree of Cuiwei Historic District is 0.61643, the local average integration degree is 1.27401, and the average local integration degree is significantly higher than the global integration degree. The space forms a good space as a whole, and the interaction between the two is weak.



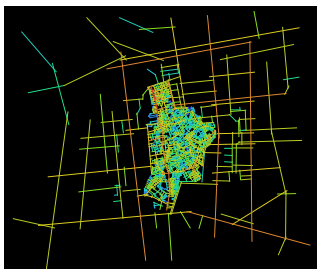
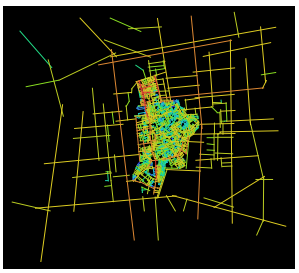



Figure 3. Global integration degree
Figure 4. R=3 local integration degree
Figure 5. R=5 local integration degree
Figure 6. R=7 local integration degree

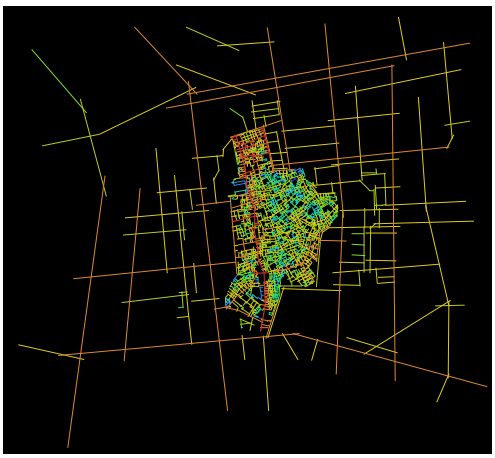


Figure 7. R=9 local integration degree

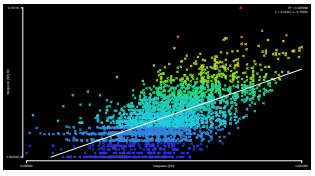
3.3 Analysis of Synergy and Relevance of Cuiwei Historic District

Construct a linear regression equation of global integration degree and local integration degree in Depthmap. The ratio of the two is the degree of synergy, which measures the potential of the research scope to create sub-interfaces, that is, whether the streets in the research area are isolated from the outside development, if R2>0.7 and R2 <1.0, the system synergy is high, and the flow of people and vehicles in the Cuiwei Village block form a good spatial feature, otherwise, it is low.

The scatter point distribution diagram is shown in *Figure 8*. It can be seen that R2=0.398, and the red dot and yellow dot are far away from the straight line, indicating that the degree of synergy is low.

Then import the data into SPSS, as shown in *Figure 9*, we can get The Pearson correlation coefficient is 0.432, and the distribution of points presents an irregular state. The neighborhoods of Cuiwei Village are isolated from the outside world, and people cannot reflect the whole through local perception. The lack of synergy within the space indicates that Cuiwei Historic District not only has a relatively obvious interface with the outside world, but also has weak spatial recognition and lack of distinctive features. The interior cannot maintain a relatively homogeneous and unified internal attributes, which is manifested in the core of the spatial network.

From the above analysis of global integration and local integration, it can be found that the closed development model of the rural interior protects the historical relics within the historic district within a certain period of time, and avoids the impact of the external development and construction of the neighborhood. The development performance of the area in recent years is particularly obvious. The core of the historical block space is the straight street of the market, and the distributed crowd flow can make the street space less vigorous, while the remaining street network does not play its due role in function and spatial dissolution. There is an obvious interface with the outside world, and this kind of boundary also has a certain effect on the communication activities of the people. The closure of the space makes the people in the area form a wall on their own cognitive map.



		全局整合度	局部整合度
全局整合度	Person相關性	1	0.432
	顯著性（雙側）		0.001
	N（個案數）	60	60
局部整合度	Person相關性	0.432	1
	顯著性（雙側）	0.001	
	N（個案數）	60	60

Figure 8. Analysis of the degree of synergy

Figure 9. Correlation analysis of the degree of global integration and local integration of Cuiwei Village

With the sounding of the clarion call for urban renewal in Zhuhai, the government has increased the investment of funds in the Qianshan area. The infrastructure and supporting facilities have been gradually improved, and many high-rise buildings have been built. There is a strong contrast between the internal and external environments of Cuiwei Village. This kind of space cannot make the internal spatial nodes of the village block and the global system establish a good unity and integrity, and the local spatial environment cannot reflect the spatial pattern of the overall historical block. Features. Investigating the reasons, the quality of the streets and lanes in the village are not the same, the difference is large, the space is messy, which affects people's intuitive experience, and makes the aggregation effect of the streets

and lanes poor. In response to the above problems, in the integration of streets and lanes, the main axis should be used as the basis to extend the street space, effectively connect the streets, lanes, and lanes. At the same time, set up relevant signs beside the streets to enhance the recognizability of the neighborhoods and integrate them in the transformation. The street network is divided into functional partitions reasonably, and the overall vitality of the street is improved through the catalytic effect. In order to further explore the spatial connection and self-organization of Cuiwei historic blocks, the number of street segments and the degree of integration correlation degree under different radii are analyzed and researched. The article analyzes the density and local number of street segments with parameter radii of 3, 5, 7, and 9 respectively. The correlation of the integration degree is calculated, as shown in Figure 10-14, and when the parameter radius R=7, R2=0.82391 has the highest correlation, and R=7 is the radius of the historic city, which means it is based on the historic city. The density and integration of the road network within the scope are the most relevant.

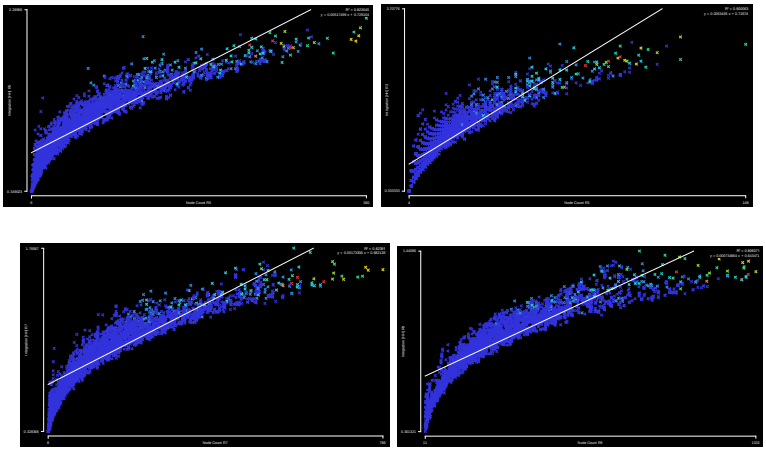


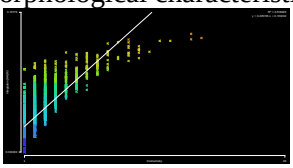
Figure 10-14. R=3,5,7,9 stage number density and local integration degree

4. THE COMPREHENSIBILITY OF CUIWEI HISTORIC DISTRICT

The degree of intelligibility reflects the degree of relevance and unity between the local structure and the whole within the village space system. The value of the degree of intelligibility can be represented by R2, which is divided into local intelligibility and global intelligibility, reflecting whether the space is easily accessible. Crowd recognition, that is, local recognizability and global recognizability.

(1) Local intelligibility: In the space syntax theory, when constructing the axis model, the X axis is defined as the connection value, and the Y axis is defined as the local integration degree RN', where the value of N'is 3, that is, R3, where The higher the R2 value, the easier it is for people to perceive the space from the local to the whole, and it is easier to establish their spatial perception image from the local to the whole, that is, the cognition of the whole space from the local. When analyzing the intelligibility of Cuiwei Village's historical districts, it is recommended to adopt a walking experience method. The calculated R2 value is 0.51602, which is between 0.5 and 0.7. Import the data into SPSS.

As shown in *Figure 15*, the scattered points are obtained. The Pearson correlation coefficient is 0.813, which is relatively close to 1. As shown in *Figure 16*, the connection value and the degree of local integration are highly correlated, indicating that the local comprehensibility of the block is better, and the correlation and unity between the local structure and the whole are strong, indicating that the spatial characteristics of the old city are more obvious , And has a good local understanding, but the global understanding is poor, and the spatial recognition is weak. It shows that when people walk in Cuiwei Village, they can predict the spatial shape around their location. From the north-south direction, following the direction of Cuiwei Street, Market Straight Street, and Dafang Street, one can walk out of Cuiwei Village well, from east to west. Look, you can also walk out of Cuiwei Village along the direction of Changshui Street. However, it is difficult to grasp the overall spatial shape of the area, so sometimes some tourists are easily lost. On the one hand, for Cuiwei Village, its neighborhoods are spontaneous and there are no obvious organizational rules to follow. The streets are crisscrossed and connected and varied. When people walk from one street to another, the spatial perception changes more. The block is large, resulting in a low overall comprehensibility of the block. In the other direction, follow the direction of Cuiwei Street to Dafang Street. This street is relatively straight, which allows people to judge the spatial direction more clearly, so it is easier to judge the space before and after the street morphological characteristics, with good local recognition.



		連接值	局部整合度
連接值	Person相關性	1	0.813
	顯著性（雙側）		0.000
	（個案數）	60	60
局部整合度	Person相關性	0.813	1
	顯著性（雙側）	0.000	
	（個案數）	60	60

Figure 15. Comprehensibility analysis diagram

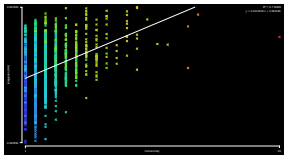
Figure 16. Correlation analysis of Cuiwei Village connection value and local integration

(2) Global intelligibility: Construct a linear regression equation for global integration and connectivity, and obtain the correlation between the two through observation. If R2<0.5, the correlation between global integration and local integration is poor, indicating that tourists and villagers It is not possible to better perceive the spatial characteristics of the entire block system through the local spatial characteristics of the block, that is, it is difficult for people to obtain the information from the local space to correctly guide the planning and design of the space, and to establish the entire spatial system is incomprehensible. It can be seen from Figure 15 that R2=0.1195<0.5. The analysis diagram shows that the distribution of scattered points presents a non-linear layout. The reddest point is farther from the straight line, and the overall dispersion is farther from the curve of fit. , The two are completely irrelevant, indicating that the Cuiwei Historic District is completely lacking in spatial characteristics and has poor comprehensibility, that is, the local space does not have the guidance of the walking direction, it is easy to get lost, the overall spatial law or the characteristics are not obvious or prominent, and the residents or It is not easy for visitors to perceive the macroscopic composition of the block space according to the environment composed of the microscopic elements of the local space.

Through the analysis of the geometric properties of the axis model, it is found that the spatial characteristics of the streets and lanes of the historic districts show irregularities, and the coefficients of the T-shaped roads and broken roads such as Zhongheli, Renheli, Tengfengli, and Nanmingli are

obviously higher, which is also confirmed Seven streets and Qili lanes show a tendency of fragmentation, resulting in many local spatial connections that cannot be well integrated into the overall spatial system. Therefore, conclusions drawn from such visible streets are easier for tourists and village residents to disagree. The awareness of the entire system space is poor and misleading. Therefore, people's activities exhibit randomness, which greatly reduces predictability.

Import the data into SPSS, and the scatter diagram is shown in Figure 18. From *Figure 17*, it can be seen that the Pearson correlation coefficient is 0.166, which is close to 0. It shows that when pedestrians pass through the local space of Cuiwei Village, they cannot perceive the overall system space. Through further observation, it is found that the yellow scattered points in the system are in a state of non-linear distribution, and at the same time they are separated from the correlation trend line. The slope is small, indicating that the core part of the Cuiwei Historic District is less understandable and its spatial system It is difficult to be perceived by tourists and villagers, that is, the possibility of being understood by people is very low. In addition, it can be seen from *Figure 17* that the yellow scattered points are located on both sides of the fit line. The point is far away from the line of fit, indicating that the comprehensibility of Cuiwei's core streets is quite different from the overall comprehensibility, which means that the level of imageability of this historic block will be less prominent in the entire block. The identifiability of site features has obvious disadvantages in spatial structure. The sense of security of the place is poor. In real life, such a space system can often give people unclear directions and coordinates.



		連接值	全局整合度
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	顯著性（雙側）		0.206
	N（個案數）	60	60
全局整合度	Person相關性	0.166	1
	顯著性（雙側）	0.206	
	N（個案數）	60	60

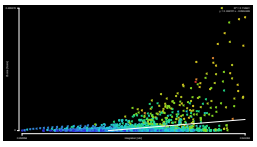
Figure 17. Linear regression equations of global integration and connectivity
Figure 18. Correlation analysis of Cuiwei Village connectivity and global integration

4.1 Human flow interface and symbiosis

Analyzing the correlation between the degree of integration that reflects the crowd's activity trend and the degree of choice that reflects the possibility of the crowd's choice of paths, it is concluded that the flow of people interface can reflect the degree of integration between the flow of people in the Cuiwei Historic District and the overall flow of people. The larger the value of the human flow interface, it means that the possibility of crowd gathering and passing is more synchronized. The attractiveness of the space is higher. The smaller the value of the human flow interface indicates that the possibility of crowd gathering and passing is not synchronized. The space has a lower attractiveness. The network is not conducive to the gathering of people, and adversely affects the spatial vitality of the overall village block.

In the space syntax theory, when constructing the axis model, the X global integration degree and the Y axis are defined as the degree of selectivity, as shown in Figure 21. From the perspective of the overall space, the R2 value is 0.115, which is lower than 0.5. Import the data into SPSS (*Figure 20*), the Pearson correlation coefficient is 0.085, which is relatively close to 0. It shows that the correlation is poor, indicating that the global

integration degree of the block does not match the global selection degree. This means that the Cuiwei Historic District is more inclined to separate the flow of villagers and tourists within the village from the overall flow of people crossing the block; from the perspective of economic significance, this trend may cause the internal commercial profit of the village to increase. Under people's "travel economy", the efficiency is low, which in turn has an unfavorable effect on the development of the vitality of the district. From the perspective of cultural significance, this trend is conducive to creating a space with strong cohesion. Ensure that the daily life and study of villagers always play the role of continuation of the village culture, and the overall space of the village cannot have a more positive impact on the mobility of internal space; from a sociological point of view, this trend is more likely to reduce the relationship between local villagers and local villagers. The possibility of gathering and exchange of people from outside the block is not conducive to the development of vitality of Cuiwei's historic block and the feedback of block characteristics to people. This means that the core block as a whole presents a defensive state, and the spatial form characteristics are cohesive.



		選擇度	全局整合度
選擇度	Person相關性	1	0.085
	顯著性（雙側）		0.000
	N（個案數）	3211	3211
全局整合度	Person相關性	0.085	1
	顯著性（雙側）	0.000	
	N（個案數）	3211	3211

Figure 19. Human flow interface analysis

Figure 20. Correlation analysis of Cuiwei Village selection degree and global integration degree

Through investigation and analysis, it can be seen that the business forms of Shengtangli, Cuiwei Street, Market Straight Street and Dafang Street are relatively densely distributed, with good commercial functions, humanistic space, high degree of choice, and a large flow of people passing through, but the northern part of the block The area of the square for people to rest and stay is small, which greatly reduces the time the people spend in the space, affects the overall space efficiency of the entire Cuiwei block, and has a negative impact on the shared space. Construct a linear regression equation for the degree of integration and selectivity of different scales, as shown in *Figures 21-24*. It is expressed by symbiosis to describe the local space carrying the mixed function of the area. The larger R2, the larger the mixed function of the lot; otherwise The bearing function of this section has a strong unity.

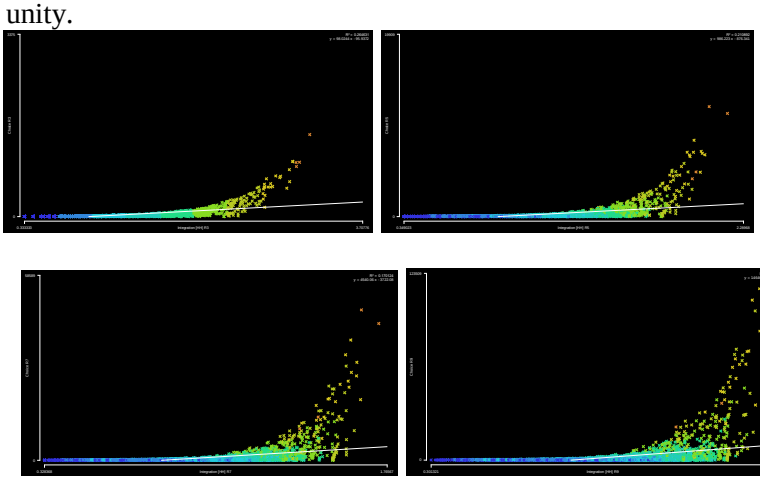


Figure 21. R=3 symbiosis degree

Figure 22. R=5 symbiosis degree

Figure 23. R=7 symbiosis degree

Figure 24. R=9 symbiosis degree

4.2 Topological depth and spatial correlation degree of streets and lanes of Cuiwei Historic District

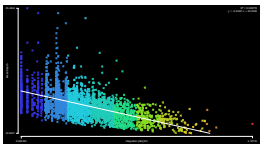
The accessibility and dispersion degree of the block can be analyzed through the depth value. The average depth is the minimum number of steps required to go from a node to other nodes in the space. The smaller the average depth, the higher the accessibility of the space, and vice versa. low.

This study selects the average value sui Figure for walking scale and topological depth, as shown in *Figure 2* to analyze the historical block of Cuiwei, the average topological depth of the pedestrian block is 16.1463, and the street with the lowest average depth among the internal roads of the block is the straight street of the market. *Figure 4* has been marked by AA with a value of 11.4000, so in the internal roads of the village, the street market has a higher accessibility; followed by Dafang Street with a value of 11.6249. The BB sign has been used in *Figure 4* to indicate that people arrive These roads have fewer turns and are easier to reach. These roads are less difficult. In actual inspection, these two roads, together with the north and south of Cuiwei Village, are important transportation fortresses since the formation of Cuiwei Village, and they are also migrant workers. , The only way for the villagers, the business on both sides is relatively prosperous. From the perspective of Baidu Time Machine in different years, the business functions on both sides of the two roads are constantly changing, and they play a huge role in the entire village. In the evening, there are more vendors setting up the stalls, and many migrant workers will eat supper here, thus gathering more people, and the integration of road space is also the area with the highest integration of village space.

Among the external roads, the average depth of Cuiqian Road A is the lowest, with a value of 10.6327 indicating that it has better accessibility, followed by Mingzhu Road with a value of 10.6844. During the field investigation, Cuiqian Road A is on the right side of Cuiwei Village Mingzhu Road is on the west side of Cuiwei Village. The two roads have good traffic convenience and large traffic flow. Mingzhu Road has three bus stations, namely Mingzhu North Station, Cuiwei Station, and Cuijing Industrial Zone Station, with 17 and 20 stations respectively, 16 lines; Cuiwei Road has three bus stops, namely Jiayuan, China Merchants Garden City South, and Henglong School. There are 3, 5, and 6 lines respectively, and the bus accessibility is good.

The 7th Street, Qili and 1st Lane of Cuiwei Village Pedestrian District is selected to calculate the depth value. Because of the influence of the walking scale, in the spatial syntax theory, when constructing the axis model, the X local integration degree and the Y axis are defined as the depth value. Construct a function model to analyze the correlation. The analysis result shows that as the main axis of Cuiwei pedestrian street, its R2 value is only 0.3298 (*Figure 25*). Importing the data into SPSS (*Figure 26*), the Pearson correlation coefficient is 0.417. Closer to 0. The depth and local integration are poorly related, and the relationship with other streets and lanes in the block is low. For the overall space of the block, it is not conducive to its improvement. In actual investigations, the flow of people present in the block mainly gathers while gathering in other streets and lanes is insufficient to affect the experience of outsiders. Therefore, it is necessary to sort out the walking experience space and strengthen the construction of spatial network

to improve the correlation between streets and lanes, which is effective The main purpose and means of stimulating spatial connection.



		深度	局部整合度
深度	Person相關性	1	0.417
	顯著性（雙側）		0.001
	N（個案數）	60	60
局部整合度	Person相關性	0.417	1
	顯著性（雙側）	0.001	
	N（個案數）	60	60

Figure 25. Correlation analysis of Cuiwei village depth and local integration degree
Figure 26. Correlation analysis of Cuiwei village depth and local integration degree

4.3 The connection value of the horizon and the spatial characteristics of the historical area of Cuiwei Historic District

It can be seen from *Figure 27* that the overall tone of the connection diagram of the Cuiwei Historic District shows a colder color. Only the line of sight connection value of Cuiwei North Street is displayed in red, showing a higher sight connection value, followed by the area on the north side of Dafang Street, where there are related imperial temples and Caibo Temples on the west side, and the average connection value on the west side Obviously larger than the middle and east sides. Compared with other streets and the overall space of the village, the connection value of the main streets of the village is in a higher state. Some streets, lanes, and lanes are in a disconnected and scattered state. Areas with high internal connection values are in the external space of Sanwang Temple, the entrance area of Dafang Street, Huishan Wugong Temple, the external space of Jieweng Wugong Temple, and the north side of Cuiwei Street, indicating that the overall block space has a lower potential Viewing degree, that is, people get a smaller scope of view from a certain local space inside the block, and it is also related to the geometric characteristics and geometric shapes of the internal space of the street. In addition, the lack of effective node space inside the entire historic street makes the visual penetration between the block spaces to a certain extent weak, resulting in poor permeability.

From *Figure 28*, we can see that in the internal street space of Cuiwei Village's historical block, the areas with the highest degree of visual integration are concentrated in the street straight street, road A, Renheli, Zhongheli, Dunmuli, Tengfengli entrance, Meisong Wugong The external space of the temple shows that these areas have a high degree of integration of the field of view, and the depth of the global line of sight is relatively shallow, that is, people can see other elements of the space without having to go through many turns, and have good visibility and visibility in the entire space system of Guiding role.

Figure 27. Connection value analysis diagram
Figure 28. Cuiwei Village visual integration degree and integration degree axis superimposition diagram

5. REFERENCES

At this stage, the internal space layout of the streets and lanes of Cuiwei Historic District is rather chaotic. Cuiwei Street, Market Straight Street, Dafang Street, and Huaganglin Street have strong spatial cohesion and low average depth. People have fewer turns to reach these four roads, so it is easier to reach these four roads. Not only is the visual field connection value relatively high, that is, it has low visibility and good spatial penetration, but also has a high degree of integration and a suitable communication scale. Space syntax still has an irreplaceable position not only for the space of villages and lanes, but also for the space research of the entire city. Although the software is simple, it involves a wide range of concepts and is relatively abstract. The research value and space are huge, and it can be compared with SDNA in the future. Combined with a more in-depth study of the street space system.

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