




Historical Perspective on the Preservation of Production Techniques and Material Applications in the Carved Ornamentation of Hui-Style Architecture

Zihao Cao ¹, Muhizam Mustafa ^{2*}, Cheng Zhang ³ Mohd Hafizal Mohd Isa ⁴

¹ Ph.D Candidate, School of the Arts, Universiti Sains Malaysia, Penang, Malaysia

² Associate Professor, School of the Arts, Universiti Sains Malaysia, Penang, Malaysia

³ Ph.D Candidate, School of the Arts, Universiti Sains Malaysia, Penang, Malaysia

⁴ Associate Professor, School of Housing, Building & Planning, Universiti Sains Malaysia, Penang, Malaysia

* **Corresponding Author:** mmuhizam@usm.my

Citation: Cao, Z., Mustafa, M., Zhang, C., & Mohd Isa, M. H. (2024). Historical Perspective on the Preservation of Production Techniques and Material Applications in the Carved Ornamentation of Hui-Style Architecture. *Mediterranean Archaeology and Archaeometry*, 24(1), 74-96. [10.5281/zenodo.10591919](https://doi.org/10.5281/zenodo.10591919)

ARTICLE INFO

Received: 10 Sep 2023

Accepted: 12 Dec 2023

ABSTRACT

The Hui-style architecture exhibits distinct regional characteristics, with the quintessence of its carved ornamentation deriving from traditional carving techniques and material selection. The carved ornamentations of Hui-style architecture amalgamate influences from a multitude of artistic domains, including various schools of painting and the integration of Chinese ethnic artistry. This research endeavors to comprehensively examine and discern the artistic forms of carved ornamentation within Hui-style architecture. This objective is pursued through a combined approach of on-site investigations of historic Hui-style architectural sites and a synthesis of relevant literature. By analyzing the regional characteristics, production techniques, and material application pertaining to Hui-style carved ornamentation, the intention is to deepen the understanding of the intricate artistry behind these ancient architectural embellishments. Finally, based on the actual challenges of Hui-style architecture in the field of regional art, this study provides preservation guidelines for carved ornamentation of Hui-style architecture with regard to the three aspects of physical preservation, managerial oversight and inheritance strategies in order to maintain the preservation of the art of carved ornamentation of Hui-style architecture and to promote its flourishing development.

Keywords: Carved Ornamentation, Hui-Style Architecture, Production Techniques, Material Application, Preservation Guideline.

INTRODUCTION

Hui-style architecture, as one of the six major schools of ancient architecture in China, is a precious ancient heritage of Huizhou region, and was included in the UNESCO World Heritage List in 2000 (D. Zuo, Li, Lin, Chen, & Kong, 2022). Hui-style architecture is renowned for its distinctive carved ornamentation, as show in [Figure 1](#). The Hui-style carved ornamentation encapsulates the wisdom and creativity handed down through generations of Huizhou merchants, becoming a distinctive regional hallmark within traditional Chinese architecture due to its exquisite and intricate attributes (Dong et al., 2018). As an important carrier of Huizhou culture, the carved ornamentation of Hui-style architecture is representative of the carving art in traditional Chinese architecture for its profound cultural connotation and characteristics, which impacts the identity of the locals.



Figure 1 (a). Photographs of Hui-style Architecture; (b). Photographs of Three Carved Ornamentation of Hui-style Architecture

The production techniques and material applications of Hui-style carved ornamentation have undergone a long developmental journey (G. Cheng, et al., 2023). In terms of carving technology, the 'Huizhou Three Carvings' stand as the primary representatives of Hui-style architecture's production techniques (Cao & Bin Mustafa, 2023). As a reflection of regional characteristics, Hui-style carved ornamentation is renowned for its precision, delicacy, and intricate complexity. Regarding the material application in ancient Hui-style architecture, wood typically emerges as the most commonly employed material. The core structure of Hui-style architecture predominantly consists of wooden frames, while stone frequently serves as a crucial component for structural support. Meanwhile, brick carved ornamentation is extensively utilized for enhancing the aesthetic appeal of the buildings. Each material's carved ornamentation exhibits remarkable craftsmanship, contributing to the abundant regional beauty of these structures.

With the passage of time, the production process and materials used in Huizhou carved ornamentation have encountered fresh challenges and evolutions. Advancements in modern technology have ushered in new breakthroughs in the production techniques of Huizhou carved ornamentation. Traditional hand-carving has gradually integrated with mechanization and digitization, enhancing the efficiency and precision of the production process. However, there has been a decline in the number of traditional craftsmen, posing challenges to the preservation and continuation of this artisanal tradition (X. Gao, Li, & Sun, 2023). Furthermore, the utilization of new materials has introduced fresh possibilities for the evolution of Huizhou carved ornamentation. The advent of composite materials has improved the durability and malleability of carved ornamentation, yet the preservation of materials in historic structures has often been overlooked (Fang, Ji, Chu, Nie, & Wang, 2023).

To enhance the preservation of Hui-style carved ornamentation, historical tracing is particularly significance. In-depth interviews (Minichiello, Aroni, & Hays, 2008) with professional scholars allow for a thorough exploration of the historical evolution, production techniques, and material usage of Hui-style carving decorations from a historical development perspective (R. Gao, Liu, Shi, Zhang, & Yang, 2023). Additionally, fieldwork investigations can document various details and regional characteristics, enhancing the understanding and preservation of this cultural heritage. In summary, employing historical analysis in the study of the inheritance and preservation of Hui-style carvings not only reveals their historical background and cultural connotations but also opens up new possibilities for their development and innovation. Likewise, the results of this research can serve as a reference and inspiration for the inheritance and preservation of traditional arts in other regions (Z. Liu, 2021).

THE RESEARCH METHOD

Participant

The study involved a final sample of 38 participants, consisting of 12 historians (HP 1-12) and 12 archaeologists (AP 1-12) specializing in Hui-style architecture, and 14 practitioners of Hui-style architectural carving (CP 1-14). This sample was derived from an initial convenience sample of 45 individuals, representing the maximum number of participants we could gather during the research progression using the snowball sampling technique, where 7 individuals were unable to continue due to various personal reasons and thus had to withdraw. Each participant was assigned a unique code, and all were individually contacted to provide relevant qualitative data for this study. No further segmentation was made among all participants. All participants had over ten years of experience in either research or practice related to Hui-style architecture and received a financial incentive of 300 Chinese Yuan for their participation.

Instruments and Materials

Document analysis is utilized for systematically collecting, examining, and interpreting textual information to understand a specific theme, issue, or phenomenon (Bowen, 2009; Wong, Casey, & Wahl, 1982). Bowen (2009) notes that this tool can be applied to various types of texts, including books, reports, government documents, etc. The purpose of choosing this tool in our study is to conduct a detailed analysis of historical texts from government archives and qualitative data from in-depth interviews. In addition to that, historical antiquities in the Huizhou Regional History Museum are also used as one of the materials for this study.

Observation involves collecting data through direct observation and recording of the behavior, activities, or phenomena of the research subjects (Angrosino & Rosenberg, 2011). We opted for non-participatory observation to ensure the objective recording of the architectural features and to capture the authentic state of the craftsmanship process (Cohen, Manion, & Morrison, 2017). For the carved ornamentation of Hui-style architecture, we employed a DSLR high-definition camera to take photographs, using these images as primary data for subsequent analysis and discussion.

To gain the deep perspectives, we employed in-depth interviews to collect experts' experiences and insights on the carved ornamentation of Hui-style architecture. Deep interviews typically involve one-on-one interactions between the researcher and the respondent, facilitating a deeper exploration of the respondent's experiences, views, or emotions through extensive dialogue and probing questions (Allmark et al., 2009). This instrument allows interviewers to ask further questions based on the respondents' answers, promoting in-depth exploration of the topic (Showkat & Parveen, 2017). This tool is advantageous for obtaining detailed, in-depth information and provides respondents with the opportunity to freely express themselves on specific topics or issues, thereby revealing the depth of various themes or viewpoints (Rutakumwa et al., 2020). In this study, in-depth interviews were conducted focusing on the topics of materials and techniques used in carved ornamentation. We actively encouraged respondents to share their achievements and suggestions in these areas to more comprehensively gather in-depth information about the carved ornamentation of Hui-style architecture.

Data Collection and Analysis

Considering the cultural complexity of the research theme, the data collection for this study was confined to a one-year period, with field surveys, literature reviews, and interviews conducted iteratively.

Firstly, nine comprehensive data collection sessions were conducted focusing on the materials and techniques of carved ornamentation in Hui-style architecture. The photographs obtained from these field surveys served two main purposes. Firstly, these newly collected photos, combined with deep interviews, invited experts to provide relevant information, insights, or share their experiences based on these images. Experts' perspectives helped to further interpret the materials, techniques, and their application and significance in Hui-style architecture as depicted in the photos. Secondly, these photos underwent systematic image coding (Christopoulos, Skodras, & Ebrahimi, 2000), as detailed in Appendix 1. Key visual elements in each photo were meticulously annotated and categorized (Nasrabadi & King, 1988). This coding laid the groundwork for subsequent data analysis and discussion and provided reliable visual evidence for understanding the artistic features and cultural value of carved ornamentation in Hui-style architecture. The results of this coding were thoroughly interpreted in the main text, facilitating readers' understanding of the artistic and cultural nuances revealed in these photos. This arrangement ensured technical and methodological rigor in the study and maintained objectivity and comprehensiveness in data interpretation and analysis. By integrating expert insights and image coding, the study offered a multidimensional perspective on the understanding of Hui-style architectural carvings, enriching the academic discussion on the subject.

Secondly, during the literature review phase, the study thoroughly examined historical texts from CNKI,

Google Scholar, Web of Science (WoS), and historical archives in the Huizhou region. Due to the cultural specificity of the research topic, English literature resources were relatively limited, which to some extent impacted the comprehensiveness of the study, particularly in attempts to integrate Chinese traditional architectural culture with international academic discourse frameworks. However, given the significant position of Hui-style architecture in the field of Chinese historical and cultural studies, the abundance of Chinese literature resources found in CNKI was critically important for establishing the study's cultural background. Considering the temporal limitations inherent in historical research (Nicholson, 1986), meticulous interpretation of historical texts was emphasized. These texts provided detailed accounts of carved ornamentation in Hui-style architecture and valuable firsthand data for comparing cultural and artistic changes across different historical periods, striving for a comprehensive understanding of the artistic characteristics and cultural value of carved ornamentation from both historical and modern perspectives. This cross-temporal literature analysis method not only compensated for the limitations of perspective that might arise from a single literature source but also provided the study with a richer and more in-depth historical and cultural background.

Thirdly, after identifying experts for in-depth interviews, multiple deep interviews were conducted. Before the interviews, each expert was required to sign a consent form and was thoroughly informed about the upcoming research's content and purpose. Over the next year, each expert underwent six extensive interviews, each focusing on the materials and techniques of carved ornamentation in Hui-style architecture, with topics designed based on previous field surveys and literature reviews. This arrangement aimed to ensure the timeliness and relevance of the discussion content, also allowing the interviews to delve deeply into each expert's area of expertise and views (Döringer, 2021). During the interview process, we adopted a verbatim recording method to ensure the completeness and authenticity of the data collected (Halcomb & Davidson, 2006). This meticulous recording approach was crucial for capturing the nuances and deeper meanings of expert opinions (Minichiello et al., 2008). After the final interview, we determined that the data had reached saturation, meaning no more new or meaningful information was emerging, and thus decided to conclude data collection. Subsequently, all interview content was systematically organized and coded (Appendix 2). This process involved detailed analysis of the interview records, identifying main categories, and summarizing them into themes. The final coding results not only existed independently but were also correlated with photographs collected during field surveys and results from the literature review (Ochilova & Dushaev, 2019). This comprehensive analysis of multiple sources of data allowed the study to deeply understand the materials and techniques of carved ornamentation in Hui-style architecture from various angles, and also provided a solid theoretical foundation for understanding their position and significance in contemporary architectural art (R. Wang et al., 2018).

THE HISTORICAL BACKGROUND AND REGIONAL CHARACTERISTICS

Hui-style carved ornamentation stands out as a distinctive regional feature characterized by its exceptional craftsmanship and unique choice of materials. Simultaneously, it serves as a medium for conveying diverse messages, encompassing aspects such as social status, cultural connotations, and more (X. Gu, 2021). The development and evolution of carved ornamentation in Hui-style architecture are intricately intertwined with the economic, cultural, and political dynamics of the Huizhou region (Li & Xu, 2022). The genesis of Hui-style architecture's carved ornamentation can be traced back to the prosperous economic foundations of Hui-style merchants. These merchants, having amassed substantial wealth from overseas endeavors, invested heavily in the construction of their hometowns. This marriage of economic affluence and exceptional craftsmanship gave rise to Hui-style architecture, embodying a fusion of commercial capital and feudal culture. As a result, it not only possessed ornamental qualities but also carried profound regional cultural connotations (Martinez, 2022).

The Historical Background of the Hui-style Carved Ornamentation

Viewed through the lens of ancient architectural evolution, Hui-style architecture emerges as a paramount exemplar within China's historical architectural tapestry (A. Ma, 2018). C. Liu (2020) noted that among the six prominent schools of ancient Chinese architecture, Hui-style architecture (Chinese: 徽派建筑; Pinyin: hui pai jian zhu), Jing-style architecture (Chinese: 京派建筑; Pinyin: jing pai jian zhu), Jin-style architecture (Chinese: 晋派建筑; Pinyin: jin pai jian zhu), Su-style architecture (Chinese: 苏派建筑; Pinyin: su pai jian zhu), Chuan-style architecture (Chinese: 川派建筑; Pinyin: chuan pai jian zhu), and Min-style architecture (Chinese: 闽派建筑; Pinyin: min pai jian zhu) hold distinguished positions, as show in Figure 2. Simultaneously, H. Shao (2022) highlighted that these diverse schools of ancient architecture, characterized by their distinct historical and cultural legacies, encapsulate the profound weight of China's architectural history from ancient times. Wang (2022) underscored the pivotal role that Hui-style architecture occupies within the realms of Chinese architecture and art. He contended that the intricate sculptural elements present in Hui-style architecture impeccably

showcase the exceptional craftsmanship of artisans from bygone eras. Furthermore, the carved ornamentation found in Hui-style architecture serves not only as a visual presentation but also as a symbol and integral aspect of Huizhou culture. It embodies the rich history, culture, and humanistic characteristics of this region.



Figure 2. The Six Prominent Schools of Ancient Architecture in China

Generally, when examined through the lens of historical perspective, the evolution of various phenomena frequently adheres to a pattern of emergence, zenith, and decline. Likewise, the historical trajectory of carved ornamentation in Hui-style architecture can be observed to follow a similar sequence. In this study, we have partitioned this evolution into four principal stages (Table 1).

Table 1. Four Major Stages in the Development of Carved Ornamentation

	Development process	Background foundation	Features
Song and Yuan	Birth period	Birth due to war factor	Simplicity
Ming Dynasty	Developmental period	rise of the Huizhou merchants	Coarse and plain
Qing Dynasty	Peak period	prosperity of the Huizhou merchants	Fine and complicated
Late Qing Dynasty	Decline period	Decline due to war factor	N/A

The carved ornamentation of Hui-style architecture can be traced back to the Song-Yuan period (960-1368 AD), which is the oldest period in which Hui-style architecture has been built in archaeological discoveries (Y. Zhao, 2015). Under the turbulent social background at that time, a large number of people from the Central Plains of China came to Hui-style in order to escape from the war and fused the courtyard architecture of the Central Plains with the regional characteristics of Hui-style, resulting in the earliest Hui-style architecture complex (Pi & Jia, 2011). At the same time, the concept of hierarchy in architectural carved ornamentation was introduced to Huizhou by these immigrants from the Central Plains during this period. At that time, the society differentiated people according to the strict social hierarchy of scholar-peasant-agricultural-industrial and businessmen, and the carved ornamentation used on the houses of people of different ranks was required to be different, and it was not allowed to use carved ornamentation across the ranks (Ding et al., 2010). Nevertheless, at that time, due to the limitations of economic insufficiency and social war, the carved ornamentation of Hui-style architecture was not very fine, and most of them were made from local materials, with simple ornamental elements, such as some regional totems and symbols, and so on (W. Gao, 2012). This period is the birth stage of Hui-style architecture carved ornamentation.

During the Ming Dynasty (1368-1644 AD), this was the early stage of the development of Hui-style architecture and its carved ornamentation was gradually refined from simple to elaborate. Based on the regional cultural characteristics of the Huizhou region - children were encouraged to go into business and politics. With the large increase in population during the Song and Yuan dynasties, the Huizhou merchant community began to grow in size during the Ming Dynasty in China's business world at that time. At the same time, the education in

Huizhou emphasized the importance of teaching the descendants to return to their hometowns, meaning that no matter where they did business, they had to return to their hometowns when they were old (B. Wang, 2021). At that time, many Hui-style merchants brought a lot of wealth from abroad, which economically gave Hui-style architecture a perfect foundation for development (Lu, 2020). As a result, more and more Hui-style architecture related practitioners were produced, and these craftsmen combined the previously simple regional totems and symbols with new design concepts to produce new ornamental design elements. The technology of stone and wood extraction gradually took shape, and the requirements for the quality of the materials were gradually emphasized, which is the reason why the extant Hui-style architecture of the Ming Dynasty period is relatively abundant (X. G. Zhou, 2018). Many ornamental designs with deeper meanings were produced in this period, such as animals and plants with auspicious symbols. However, due to the fact that the technology at that time did not form a system, the carved ornamentation was rather crude and plain.

Although Hui-style architecture of the Ming and Qing dynasties are often discussed together, there are some differences between the two periods when analyzed from an historical perspective (Song & Liao, 2023). The Qing Dynasty (1616-1911 AD) was a period of cultural prosperity in Huizhou, a period of prosperity for the Hui-style business community in China's history, and the peak of Hui-style architecture (Y. Zhao, 2011). Based on the commercial prosperity and cultural uniqueness of the Huizhou region, Huizhou culture formed a comprehensive cultural system combining business practices, culture and art (Shi & Yu, 2021). The merchant community in Huizhou prospered and business became their main activity, and a unique business culture was gradually formed. Over time, the affluence of the economic base elevated the high demands of the Huizhou people for their homes. The quality of materials was highly emphasized during this period, and both the quality of wood and stone and the paper-burning process of bricks were greatly enhanced (L. Tang, 2007). Since then, Hui-style carved ornamentation gradually developed into an independent art form and expanded into the fields of carving craft, traditional wood carving, and stone carving, reaching its heyday (Jin, 2007). The carved ornamentation of the Qing Dynasty was famous for its fine and complex regional characteristics, pursuing a unique artistic style and high craftsmanship skills (Zhang, 2022), such as a variety of fine figures, even facial expressions and finger movements are exquisite.

By the end of the Qing Dynasty around the Republican Period (1912-1948 AD), Hui-style architecture carved ornamentation gradually declined due to social warfare and the decline of Hui-style merchants (R. Liu, 2007). During this period, on one hand, there was not enough economic base, on the other hand, a large number of populations went to war to defend their homes. This led to a break in the transmission of materials and techniques, and it was even difficult to find Hui-style architecture built during that period (X. Zhou, 2006). On the contrary, cultural invasions by other powers led to architectural styles from other regions being built in Huizhou (Y. Zhu, 2005). In the process of historical investigation from an historical perspective, several buildings that do not conform to Hui-style characteristics were found, such as a guild house built during the Republican period located in Xidi Village in Hui-style (Figure 3), and such buildings could not find the slightest Hui-style architecture traditional regional characteristics. As a result, the carved ornamentation has disappeared rapidly along with the decline of Hui-style architecture without its former splendor.



Figure 3. The Guild Hall Built During the Republican Period in Xidi Village, Huizhou.

Overall, war played a pivotal role in both the birth and decline of Hui-style architecture's carved

ornamentation. However, driven by a pursuit of cultural, artistic, and commercial success, Huizhou merchants actively contributed to the development of local art. This reflects the wisdom and mindfulness passed down through generations of Huizhou merchants and fulfils the need for aesthetic pursuits in the societal context of their time. The prosperity of Hui-style carved ornamentation and its architectural forms vividly mirror the unique aesthetic concepts and regional lifestyle of Huizhou culture. In the realm of architectural design (Y. Q. Zhang, 2023), the distinct artistic style of Hui-style architecture has become an invaluable resource for designers, enriching architectural forms and expressions. As an integral facet of Huizhou culture, Huizhou carved ornamentation boasts a rich historical background and unique artistic allure. By delving into its historical context, we can better grasp the value and significance of Huizhou carved ornamentation. Simultaneously, it offers valuable references and insights for the preservation, transmission, and innovation of this cultural treasure.

Regional Characteristics of Hui-style Carved Ornamentation

Hui-style carved ornamentation focuses on exquisite details, and its regional characteristics are mainly manifested in the two aspects of carving technology and materials. The technology of Hui-style carved ornamentation is very fine, and this exquisite craftsmanship is an important part of the unique charm of Hui-style architecture. At the same time, bricks, wood, and stones are used as the main raw materials, in which a large number of woods is used as the main structural material, combined with the embellishment of stones and bricks. Both structural and visual systems create a unique architectural style. Among them, Hui-style architecture is the main manufacturing technology of Hui-style architecture. Hui-style three carvings refers to the general name of three Hui-style folk carving crafts: wood carving, stone carving and brick carving (Table 2).

Table 2. The Features of Huizhou Three Carving

	Wood carving	Stone carving	Brick carving
Location	Main structures of buildings	Lower sections of structures	Upper sections of the structure
Material source	Local wood	Local stone	Bricks fired by ancient techniques
Presentation style	Integral presentation, mortise and tenon construction	Integral presentation	Patchwork presentation
Tools	Knives, chisels, needles, hammers, and other hand tools		
Basic skill	The basic ability of Huizhou mural painting		
Carving technique	Relief carving, embossed carving, round carving, etc.		
Displayed content	Totems, symbols, animals, plants, people, etc.		

"If it were not for the geographical advantage of the mountainous and tree-lined Hui-style architecture in the Huizhou region, it would have been difficult for Hui-style architecture to develop so much" - AP 3

Huizhou woodcarvings were often used to decorate the main architectural structures, such as doors, windows, beams, pillars and friezes. Huizhou woodcarving artisans advocate delicate and exquisite carving techniques, and most of the wood comes from local trees; the Huizhou region is mountainous and wooded, thus facilitating the development of Huizhou woodcarving techniques with material resources (S. Zhao, Guo, & Wang, 2015). Not only that, Huizhou woodcarving, besides displaying the whole wood, usually uses the carving technique to combine the wood with mortise and tenon structure, which tests the craftsmen's skills even more (Qi, Li, Xiao, & Zhang, 2021).

Huizhou stone carvings are commonly used to decorate the lower end of architectural structures, such as arch gates, walls, and courtyards at the lower end of the structure. The stone carving technique often uses thick, local Yixian blue stone from Huizhou as the material (B. Zheng, Sui, Tan, & Zhang, 2019), which is carved to create a more rugged and heavy shape, giving a solemn and dignified look. Moreover, stone carvings are usually whole pieces of stone carved as a finished product for display, so particular attention is paid to the accuracy of the proportions, enabling complex large-scale carved ornamentation to be carved with considerable precision.

Huizhou brick carvings are often used to embellish the upper ends of architectural structures, such as walls, columns and arch gates. Huizhou brick carvings are very strict in the selection of materials, often using bricks fired by ancient Huizhou techniques, which need to go through more than a dozen procedures to be completed (D. Zuo et al., 2022). The craftsmen compose various patterns and motifs by carving and then splicing them together, making the carved ornamentation more beautiful and durable.

"The three carving crafts are influenced by each other, so many years of development, in fact, the craft itself

has long formed the characteristics of our Huizhou" - CP 5

Besides, the three Huizhou carvings show some commonalities in terms of tools, basic skills, carving techniques, and display contents. First, all three techniques require the use of knives, chisels, needles, hammers, and other hand tools made by the craftsmen themselves. This is because the craftsmen are in pursuit of the ultimate skill and want the tools to be more durable (Bao, 2005). Secondly, the craftsmen were required to have basic skills in Huizhou mural painting. This is because Hui-style architecture was more often decorated with frescoes in more ancient times, and the foundation of frescoes ensured that the craftsmen had the ability to model the details of the carved ornamentation and to use traditional tools such as knives and chisels to carve rich details after the first drafts of the materials were drawn according to the design drawings (Bao, 2005; Zhai, 2005). Thirdly, the abilities for carving techniques are common in all three carving techniques, for example, techniques such as relief carving and line carving are used in three carvings to give a sense of layering and three-dimensionality (M. Wu, 2018). It is just that the focus of the techniques corresponding to different materials is different. Lastly, the content of the three carvings' displays has all evolved together, whether it is the initial simple totems or the subsequent popular animal and plant figures, all of them have been found on the three carving products. These patterns and motifs embody the symbols and meanings in traditional Chinese culture (Shang, 2016), such as elephants, bats, lions, lotus flowers, clouds, etc., which give a magnificent and solemn artistic feeling.

From the windows and doors to the details of the buildings, displayed the profound mastery of the craftsmen in carving techniques. At the same time, the carved ornamentation can be handed down for hundreds of years thanks to the selection process of these materials. These carvings not only make the buildings more beautiful, but also are a kind of regional cultural heritage, which contains rich meanings and symbols (Pei, Gong, & Leng, 2020).

Elements and Combinations of Carved Ornamentation

Hui-style carved ornamentation is known for its fine and complex ornamental details and different combinations of elements (M. Wang, 2014; J. Zheng, 2009). Through archaeological historicity research, in-depth exploration, and analysis of the different combinations of various ornamental details in Hui-style carved ornamentation can reveal the symbolism of Hui-style culture.

"Carved ornamentation is never just for the eyes, but more importantly, each pattern and motif have a different connotation, especially when combined together, sublimating the essence of the level of ideas" -HP 10

First, studying the patterns and motifs underlying carved ornamentation is key to understanding the symbolism of Huizhou culture (X. Cheng & Han, 2023). Hui-style carved ornamentation often adopts various auspicious patterns and motifs, such as floral motifs, auspicious cloud motifs, elephant motifs, bat motifs, and so on. For example, as an important regional feature of Hui-style culture, auspicious cloud patterns are widely used in Hui-style carved ornamentation, conveying the symbolism of peace and harmony (Y. Gu, 2009).

Secondly, different locations of carved ornamentation can have different symbolic meanings (S. Wang et al., 2008; Y. Zhang, 2007). For example, elephant motifs are often used to decorate the beams and pillars of Hui-style architecture, symbolizing the pursuit of the stability of the structure (A. Li, 2021). However, when the elephant pattern appears on the arch gate, it turns into the symbolism of suppressing the house and warding off evil spirits (Sun, 2018). Through the detailed study of the display position, we can understand the ornamentations, compositions and proportional relationships in Hui-style carved ornamentation, and deeply understand its artistic style and regional characteristics.

Special emphasis is placed on the fact that the combination of ornamental elements will have different symbolic meanings. For example, the combination of five bats symbolizes the five blessings (Chinese: 五福; pinyin: wu fu), which conveys people's desire for a better life (Hu, 2021). The combination of a monkey and an elephant harmonizes with the Chinese idiom of 封侯拜相 (pinyin: Feng Hou Bai Xiang), symbolizing people's pursuit of a smooth career (H. W. Wang, 2022).

These carved ornamental elements are finely displayed through the techniques and materials of Huizhou three carvings, which are still well-preserved and show amazing durability after hundreds of years of erosion by wind and rain and the test of time. This is not only due to the high quality of the materials, but also a miracle of the craftsmen's skill. However, the value of these carved ornamentation elements is not only in their aesthetics, but also in the wisdom, beliefs and values of the Huizhou people that are embedded in each carving. The lifelike appearance of these ornamental elements is not only breathtaking, but also reflects the great attention to detail and aesthetics paid by the ancient craftsmen of Huizhou (G. Wang et al., 1989). They are witnesses to history and transmitters of culture.

THE PRODUCTION PROCESS OF HUI-STYLE CARVED ORNAMENTATION

"The carved ornamentation is all done by hand, which demands a great deal of skill from each artisan, and the most delicate aspect of it all is that no two pieces are exactly alike, even by the same carver." --CP 7

Diversity of Carving Techniques

The diversity of Hui-style carved ornamentation is reflected in the fact that Huizhou three-carving handicrafts adopt many different carving techniques. These techniques not only enrich the form and effect of the ornamentation, but also show the skill level and innovation ability of ancient Huizhou craftsmen. Three common Huizhou three carving techniques are introduced below:

Relief carving is a common technique in which a three-dimensional pattern of a certain height is carved on the surface of a material by means of a tool, which is commonly found in Hui-style wood carving ornamentation (X. Liu, 2009). Relief carving can be carefully designed and carved to present layering and three-dimensionality, making the ornamentation more vivid and lively (B. Zheng & Sui, 2018). According to the difference in the depth of the material, relief carving is further divided into shallow relief carving and high relief carving. Shallow relief is a single-layered statue with a single content and a weak three-dimensional effect (Deng, 2006). High relief is a multi-layered statue, the contents are more complicated, and it mostly adopts high precision carving techniques for hollowing, which can better show the spatial sense of the work (Bao, 2005). Such as Figure 4 (a).

Translucent carving is also one of the commonly used techniques in Hui-style carved ornamentation. Retaining the protruding part of the object and partially hollowing out the back part of the object is called translucent carving (X. Li, 2010; H. Wang et al., 2005), which is commonly found in Hui-style brick carved ornamental works. By carving certain holes or spaces in the material, it allows light to pass through and creates a unique visual effect. Translucent carving can give the carved ornamentation a sense of transparency, adding layers and depth to the space (Bao, 2005; H. Liu & Zhang, 2002). Single-sided carving only carves the front side, while double-sided carving carves both sides of the ornamentation to display, which requires a very high level of skill from the craftsman (Yu, 2000). As shown in Figure 4 (b).

Hui-style carved ornamentation also utilizes the technique of round carving, which is commonly found in Hui-style stone carving ornamentation (Yan, 1994; J. Jiang, 1991). Round carving, also known as full carving, is a three-dimensional form of carving that requires craftsmen to carve from the full range of space to express the carved ornamentation in an integrated way on all sides (Liang et al., 1986). Because of the three-dimensionality, vividness, realism, and evocativeness of the works, the selection of materials for round carvings is relatively strict, from length and width to thickness, all of which must be in the appropriate proportion to the real thing before the craftsmen can begin to shape them. At the same time, special attention is required to be paid to the unity and harmony of all angles and orientations of the work, and only in this way can the carved ornamentation of round carvings withstand the perspective of the viewer from all directions (M. Wu, 2018). As shown in Figure 4(c).

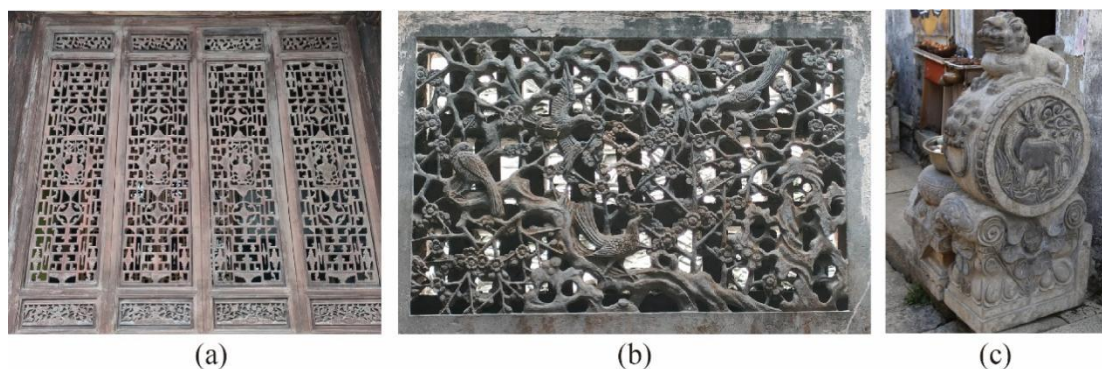


Figure 4. Different Carving Technique of Carved Ornamentation in Hui-Style Architecture

At the same time, there are many other techniques in Hui-style carved ornamentation, such as flat carving, shadow carving, line carving, etc., and their application in different ornamental elements and materials presents a rich variety of effects (Liang et al., 1986). The application of these different carving techniques not only gives Hui-style carved ornamentation a unique style and personality, but also demonstrates the exquisite skills and creativity of Hui-style craftsmen. With the development of the times and social changes, Hui-style carved ornamentation techniques have evolved and developed, creating more novel and unique ornamental effects (H. Shao, 2022). Through historical research, it is possible to reveal the techniques and regional characteristics used

in Hui-style carved ornamentation in different historical periods. This helps to better understand and appreciate the artistic value of Hui-style carved ornamentation and provides useful references and insights for its preservation, inheritance and innovation.

Evolution of Tools

"Few people insist on making their own tools nowadays. Although the hand tools are rather simple, this is the way to express the soul of Huizhou three carvings" - CP 11

The tools used in the production of Hui-style carved ornamentation evolved and improved during different historical periods (X. Wang, 2021). Through historical perspective research, it is possible to learn about these changes and understand the impact of tool use on the production of carved ornamentation. In ancient times, ornamentation in Hui-style carved ornamentation may have relied primarily on traditional hand tools. In archaeologically excavated artifact collections, tools for Hui-style carved ornamentation, such as chisel knives, planning knives, and carving knives, are displayed, as shown in Figure 5(a). These hand tools required ancient artisans to complete the carving process by hand, using exquisite skills and hand-eye coordination to realize fine patterns and motifs (X. Guo, 2015).



Figure 5 (a). Collection of Tools Excavated in the Hongcun Hui-Style Architecture Museum; (b). Modern Digital Engraving Equipment

With the development of the times, the production process of Hui-style carved ornamentation has gradually introduced more advanced tools. The use of mechanical equipment made the carving process more efficient and precise (X. Guo, 2015; Y. Jiang, 2015). As shown in Figure 5 (b), the introduction of tools such as motorized planers and CNC engraving machines made the carving process faster and finer (B. Zheng et al., 2019). The application of these tools improves the production efficiency and reduces the labor input, and at the same time puts forward higher requirements for the production level and quality of carved ornamentation. In addition to the introduction of mechanical equipment, various auxiliary tools are widely used in the process of Hui-style carved ornamentation (Hong, 2015). For example, tools such as carving knives, rasps and sandpaper are used to trim and polish the carving surface to add smoothness and texture.

"It's not that modern high-tech equipment is bad, but everyone is focused on using convenient tools to go, so who will carry on the traditional craft?" --HP 4

While the evolution of tools has improved the productivity and precision of Hui-style carved ornamentation, it has had an impact on the inheritance of traditional tools. Although advanced tools have enriched the forms and details of carved ornamentation and are better able to realize complex and fine carving effects, they have at the same time promoted innovation and change, injecting new elements and styles into Hui-style carved ornamentation. However, due to the large number of technological tools and equipment put into use, the survival market of craftsmen has been compressed, which indirectly leads to great challenges in the use and inheritance of traditional tools (Hong, 2015). At the same time, the overuse of advanced tools has resulted in a large number of new carving practitioners abandoning the use of traditional tools and choosing to use technological equipment for the production of carved ornamentation (Y. Li, 2022). This is also detrimental to the heritage of the art form. By studying the evolution of tools, we can better understand the technological progress and innovation in the production process of Hui-style carved ornamentation and provide relevant guidance and support for its preservation, inheritance, and innovation (Zhong, Jia, & Liu, 2019).

Inheritance of Technology

The heritage of Hui-style carved ornamentation is currently encountering challenges. The traditional Hui-style carved ornamentation craft requires long-term apprenticeship training and a lot of practical experience. However, with the changes in modern lifestyles, the younger generation may no longer be willing to invest enough time and energy in learning this art (Shi & Yu, 2021). This leads to a dilemma in the transmission of the skill and may result in the loss of the technique.

"The old mentor-apprentice system was hard work, but it produced real human talent" - CP 9

According to museum antiquities, in ancient times the original Huizhou three-carving craft was usually passed down through a master-apprentice system, where skills were passed down from one generation of artisans to the next. Older craftsmen passed on their years of experience and skills to the younger generation, starting with the basics and gradually taking on more complex tasks (G. Zuo, Liu, & Zhang, 2011). The transmission of the master-apprentice system allows for the effective transfer and accumulation of experience, technology, and creativity. This traditional transmission ensures the continuation and retention of skills and maintains the essence of traditional techniques and craftsmanship in Hui-style carved ornamentation, which can ensure that the technical level and quality of Hui-style carved ornamentation can be maintained and upgraded (G. Ma & Tao, 2010).

After that, Hui-style carving practitioners increased dramatically during the Qing Dynasty because of the rapid rise in demand for carved ornamentation. According to historical records, during the Qianlong period of the Qing Dynasty, there were more than a dozen local large-scale carving factories of official or private nature in Huizhou (Shu, Hu, Fang, Wang, & Ye, 2012). These carving factories were similar to modern specialized technical schools, which, in addition to producing fine carved ornamentation for the market, also included small classes similar to the master-apprentice relationship. This way of passing on the craft is similar to the modern small class teaching system, although not as detailed as the previous master-apprentice teaching, it is still able to pass on this complex craft.

"It's hard for old craftsmen nowadays to find young people who are willing to learn, because it takes too long and too much effort to make money from this craft" - AP 3

However, in modern times, due to the limitations of tools, income, and market demand, it is almost difficult to find a teaching method similar to the master and apprentice inheritance. Due to changes in aesthetic preferences, modern Hui-style architecture focuses more on simple ornamental designs, so complex traditional ornamental designs have gradually lost their inheritance, and fewer and fewer people are engaged in Huizhou three-carving. In addition to this, the teaching model of master and apprentice is hard to find today. The challenge of this traditional craft lies in the lack of inheritors, which is due to a number of reasons. Since traditional knowledge of the carving craft is usually passed on orally, there is a lack of written records and systematic teaching materials. Once a generation break occurs, this mode of transmission can easily lead to incomplete transmission or even loss of information (Y. Liu, Wang, & Su, 2023). Therefore, the preservation of the production technology of carved ornamentation should not be delayed.

Development of New Technologies

"There is so much high-tech technology nowadays, 3D engraving is very marketable right now and the productivity is very much faster than engraving by hand by an engraver" - HP 4

In modern times, some new technologies have come into being, which have revolutionized the production and preservation of Hui-style architecture carved ornamentation. The following are some of the new technologies that deserve attention:

Electronic carving technology. Traditional Hui-style triple carving craftsmanship is very delicate and time-consuming, requiring artisans to spend a great deal of time and effort to complete complex carvings. However, with the advent of electronic carving equipment, producing carved ornamentation elements has become much more efficient and precise. These devices can automatically engrave based on digital design files, greatly shortening the production cycle while reducing the possibility of human error (W. Zhu & Wei, 2022). The application of this technology allows more people to participate in the carving process and promotes the heritage of Hui-style architecture carving culture.

3D carving technology. This is another new technology leading the field of Hui-style architecture carving process. Through the use of 3D printing technology, more complex and detailed carved ornamentation elements can be produced (Z. Zhang, 2021). This technology not only improves production efficiency, but also allows craftsmen to realize previously unimaginable designs. 3D carving technology offers more possibilities for innovation and promotion of carved ornamentation.

Mold casting technique. This is a combination of modern building materials and techniques that can be used to replicate and preserve carved ornamentation elements in Hui-style architecture (X. Li, D. Li, Lu, & Wang, 2008). By creating highly accurate molds, traditional carved ornamentation can be reproduced more easily. This technique allows for large-scale reproduction of beautifully carved ornamentation elements to meet the needs of modern architecture.

"High technology is the trend, but this blind abandonment of tradition is too much to cater to the market and is not conducive to the inheritance of Huizhou three carvings"-AP 8

"We have thought about how to combine new technology, but it's difficult, and I think it takes young people to have this intelligence" - CP 5

While the emergence and application of these new technologies have improved productivity to a certain extent, they have also triggered some discussions on how to balance traditional craftsmanship and modern technology. In the process of developing new technologies, people need to consider how to preserve traditional handicraft skills and how to organically combine new technologies with traditional culture to ensure the inheritance and development of Hui-style architecture carving culture.

APPLICATION OF MATERIALS

The historical evolution and development trend of the application of Hui-style carved ornamentation materials can be revealed through the exploration of ancient Hui-style architecture sites and the study of unearthed relics. The historical information obtained in the archaeological process can also provide an empirical basis for further deepening the understanding of the ornamental art of ancient Hui-style architecture.

The Alteration of Wood

Timber not only plays an ornamental role in Hui-style carving, but also gives Hui-style architecture carved ornamentation unique regional characteristics and cultural connotations. Their selection was not only limited by available resources, but also by the ancient craftsmen's deep understanding of material properties and suitability.

In ancient times, wood used for carved ornamentation mainly came from local trees due to limited transportation routes and available resources (Y. Zhao, 2015; M. Wang, 2014). The Hui-style region is rich in mountain forest resources, including various kinds of wood such as catalpa, *artocarpus parvus* gagnep, and phoebe zhennan, which are widely used in the production of Hui-style carved ornamentation. The first one is catalpa wood, which is one of the most commonly used types of wood for carved ornamentation and belongs to the species of *arborvitae*, and its production in Huizhou is relatively scarce (Lu, 2020). Catalpa wood is hard and sharp, with a warm dark grey color. In addition, catalpa wood has the functions of heat resistance and moisture retention, which brings many advantages to Hui-style architecture (Ding, 2010). The second is *artocarpus parvus* gagnep, which is one of the more popular types of wood used for carved ornamentation and belongs to the species of *arborvitae* (G. Zhang, 1999). *artocarpus parvus* gagnep wood has a hard texture, warm color, and a unique aromatic characteristic. It is easy to work and can be polished into a smooth, delicate wood, which is why it is most used in Hui-style carved ornamentation (G. Zhang, 1999; J. Jiang, 1991). Also, there are phoebe zhennan and *diospyros ebenum* koen, each of which has its own unique characteristics. The phoebe zhennan has a delicate texture, bright color, and strong water resistance, and is mainly used to ornament the exterior walls of ancestral halls. *Diospyros ebenum* koen is denser and has a greenish dark color, which is insect-resistant and anticorrosive (Fan, 2002; Wang et al., 2000; G. Zhang, 1999). These woods not only provide a solid material foundation for carved ornamentation, but also provide a valuable historical reference for the sustainable inheritance and development of this cultural heritage.

"Nowadays we are paying more and more attention to the preservation of the natural environment, so large-scale exploitation of wood and stone is no longer an option in Huizhou locally" - CP 8

During the modern industrial period, the sources of wood used in the production of Hui-style carved ornamentation may have changed with the development of transportation and trade. However, this change may have brought some challenges and implications, especially in terms of the quality of wood carving. During the modern period, wood could be introduced more easily from other regions or countries due to the convenience of transportation, providing more choices (Yuan, 2020). This diversity may lead to differences in grain, hardness, and color of different woods, making it difficult to maintain consistency in carved ornamentation. The hardness and texture of exotic woods can be difficult to match traditional native woods, which may pose a challenge to carvers. Harder woods may require more strength and time to carve, while softer woods may not be durable enough to maintain the durability of the ornamentation elements, both of which can affect the craftsman's carved ornamentation production (B. Guo & Li, 2016).

Evolution of Stone Materials

The selection and application of stone in Hui-style carved ornamentation has undergone some remarkable changes between ancient and modern times. These changes reflect the evolution of social culture and market needs, among other things. Through the study of these different types of stone, we can better understand the way of stone selection and application in Hui-style carved ornamentation and reveal the changing trends of stone use in Hui-style carved ornamentation in different historical periods.

In ancient times, Hui-style carved ornamentation may have used locally available stones such as Yixian Qing (Chinese: 黟县青; pinyin: yì xiān qīng) stone and Lantian stone (Shu et al., 2012; Pi & Jia, 2011). According to historical records, Yixian Qing (Chinese: 蓝田; pinyin: lán tiān) is a type of stone from Yixian County, Anhui Province, China, which was mined for use in building structures as early as the Qin Dynasty (J. Zheng, 2009). Yixian Qing is a special rock that exhibits a unique texture and has a water-absorbent nature, as shown in Figure 6 (a). As a result, carved ornamentation using Yixian Qing takes on a dark color and glossy luster when exposed to water (X. Liu, 2009; Jin, 2007). Lantian stone is produced in Lantian Town, Xiuning County, and shows a greyish white color, as shown in Figure 6 (b). This stone is also water-absorbent and exhibits a dark grey color in the rainy weather of Huizhou (H. Wang et al., 2005). Ancient records indicate that Lantian stone has a long history in the development of Hui-style architecture in China, having been used in local buildings as early as the Tang Dynasty (Jin, 2007; J. Tang, 2006). Yixian Qing and Lantian stone are popular in the field of architecture and carving, and both stones are highly prized for their beauty and durability and have been used in stone carving ornamentation of Hui-style architecture for thousands of years.



Figure 6. The Stone Carvings in Hui-style Carved Ornamentation

"Choosing stones from outside the country is on the one hand cheaper and supported by the government. Though foreign stones are not as good as local stones in many ways" - AP 11

However, the modern application of stone has changed dramatically. On the one hand, due to the environmental protection policy in the Huizhou region, extensive quarrying was prohibited, resulting in a sudden drop in the production of Yixian green and Lantian stone. On the other hand, with the development of transportation, Hui-style carved ornamentation also began to use stones from other regions, such as Nanyue stone and marble (X. Chen, & C. Chen, 2022). These stones are less costly and easier to obtain large pieces of raw stone and are favored by consumers in the modern market. However, compared to the traditional stones, the stones used in recent years are inferior to Yixian green and Lantian stone in terms of both hardness and density, as well as durability. Especially in the link of ancient building restoration, the incompatibility of stone color also affects the visual consistency of the ancient building.

Brick Renewal

Hui-style architecture brick carving technology plays an embellished ornamental role in traditional Chinese architecture, enriching the visual effect and artistic value of the building. Not much has changed in terms of materials between ancient and modern bricks, and the main difference lies in the brick-burning process (E. Jiang & Lu, 2019).

In ancient times, the raw materials of Huizhou brick carvings were fired by craftsmen themselves, which largely affected the efficiency of the work due to the backward production process (M. Wu, 2018). Moreover, due to the limitation of technological level, the quality of bricks is difficult to be uniform, so the attrition rate is relatively high (S. Wu, 1999). However, brick carving ornamentations made of bricks fired by ancient methods can be handed down for hundreds of years, precisely because of these high requirements for quality, even if they do not care about the attrition rate, they have to produce fine brick carving ornamental products. As show in Figure 7.



Figure 7. The Brick Carvings in Hui-style Carved Ornamentation

"Objectively speaking, the firing technology of bricks has been developed tremendously in the last decade, and the efficiency has been improved significantly. But quality regulation currently requires greater efforts, which is a mess brought about by the market" - CP 12

In recent years, although the ancient art of brick-burning has been lost, the efficiency of brick-burning in the region has been greatly improved by the introduction of new equipment and techniques. While the brick material itself has not changed much, the introduction of mechanical equipment has also increased the output of bricks. This increase in production has not resulted in higher quality, and there is still a lack of control over the quality of the bricks due to issues such as regulation and excessive pursuit of mass production (Wang, 2020).

Application of New Materials

In the development process of Hui-style carved ornamentation, the invention and application of new materials promoted the emergence of different forms of Hui-style carved ornamentation. For example, in the modern industrial period, the application of metal materials such as iron and copper in Hui-style carved ornamentation gradually increased. At the same time, new building materials such as cement and glass also began to appear in Hui-style carved ornamentation. The introduction and application of these materials not only brought new expressions and design ideas for Hui-style carved ornamentation, but also reflected the influence of the current technological progress and social change.

Through historical exploration, it is possible to understand the evolution of the selection and use of materials in Hui-style carved ornamentation, and at the same time reveal the social, economic and cultural changes at that time. These research results have research value for the preservation, inheritance and innovation of Hui-style carved ornamentation. By comprehensively exploring the historical evolution of the materials used in Hui-style carved ornamentation, it is possible to gain a deeper understanding of this remarkable cultural heritage and to provide a basis for the next step in the preservation of techniques and materials.

FUTURAL PRESERVATION

Preservation Guidelines of Hui-style Carved Ornamentation

The development and preservation of Hui-style architecture, as an important part of traditional Chinese architectural art, is of paramount importance due to the irrational changes produced by modern materials and technologies (M. Zhao, Liang, & Lu, 2022). In order to promote the progress of Hui-style carved ornamentation,

comprehensive preservation of Hui-style carved ornamentation requires a multifaceted approach, including physical protection, management regulation, and inheritance strategies (González Martínez, 2022; Z. Zhou, Zhu, Liu, & Tang, 2021), as shown in Figure 8.

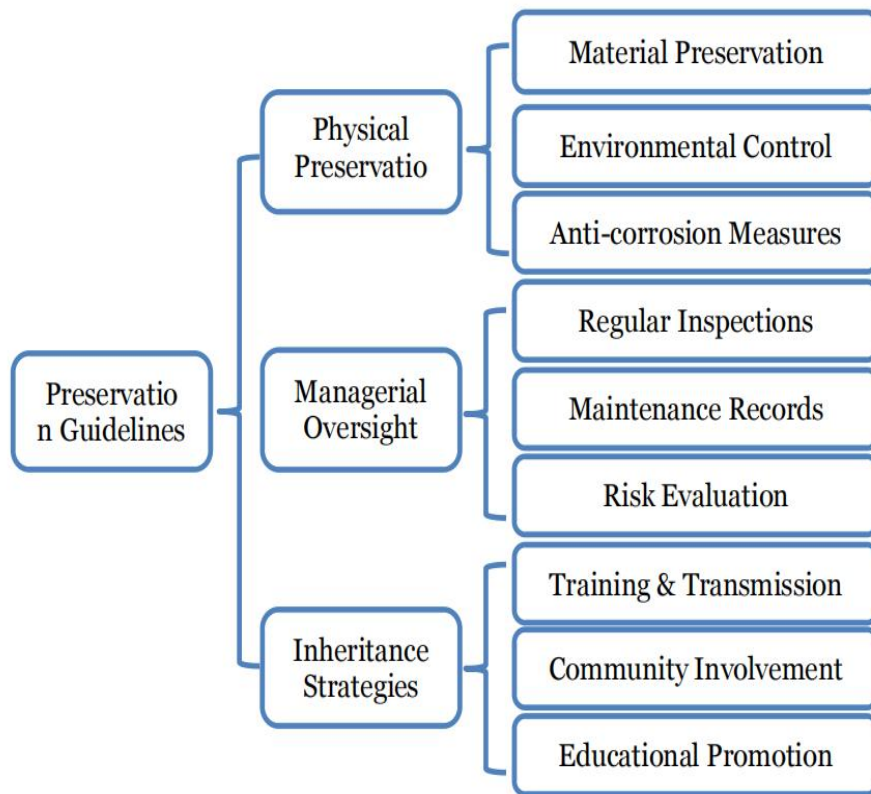


Figure 8. The Coding Results of Three Dimensions of Preservation Guidelines

Physical Preservation holds crucial significance in safeguarding the carved ornamentation of Hui-style architecture (Y. Li et al., 2023). Implementing a range of measures to ensure the integrity and durability of the carvings is pivotal to securing the preservation of this cultural heritage (Toxey, 2016).

Material Preservation: Meticulous restoration and maintenance of historic structures serve to mitigate the impacts of natural factors and human-made damages (Tomaszek, 2022). In the process of preserved restoration, the use of materials akin to the original ones is essential to ensure harmonious integration of the restored carvings with the original components (Farhan, Akef, & Nasar, 2020). Employing high-quality restoration materials helps avert damage arising from material mismatches, ensuring the restored carvings coexist harmoniously with their surroundings (Kapp, 2019).

Environmental Control: Appropriate humidity and temperature levels can retard the aging and corrosive processes affecting carvings, thereby extending their lifespan (Almssad, Almusaed, & Homod, 2022). Precision environmental control systems can effectively minimize fluctuations in humidity and temperature (C. Zhu et al., 2023), preventing expansion or contraction of carving materials due to moisture or dryness, thereby reducing the risk of damage (Timur, Başaran, & İpekoğlu, 2023).

Anti-corrosion Measures: External elements like moisture and pests in the environment can potentially harm carvings. Thus, the adoption of suitable anti-corrosion measures, such as waterproof coatings and insect repellent treatments, is essential to counteract the effects of these factors (Chaouiki, Chafiq, & Ko, 2023). These measures effectively enhance the resilience of carvings, enabling them to withstand the test of time (Chafiq, Chaouiki, Salghi, & Ko, 2023).

Managerial oversight constitutes a pivotal facet in ensuring the preservation of cultural heritage (Adegoriola, Lai, Yung, & Chan, 2023). By establishing meticulous management mechanisms and rigorous oversight measures, the potential risks and damages can be minimized to the greatest extent, thereby safeguarding the integrity and sustainability of carved ornamentation (Adegoriola et al., 2023; Fox, 2023).

Regular Inspections: Instituting a regular inspection mechanism forms the foundation of management

supervision (Maliha, Abu Aisheh, Tayeh, & Almalki, 2021). Periodically assessing the condition of carved ornamentation enables the timely identification of potential issues such as cracks, fading, and more. This, in turn, facilitates the implementation of appropriate repair and maintenance measures (Della Torre, 2021). Such timely intervention effectively prevents problems from escalating further, ensuring the long-term preservation of carved ornamentation (M. Wu & van Laar, 2021).

Maintenance Records: Each instance of maintenance and restoration should be meticulously documented, encompassing details like materials used, technical methods, and operational procedures (Adegoriola, Yung, Lai, Chan, & Yevu, 2023). Establishing a maintenance record system serves as an effective means of management supervision (Adegoriola, Lai, Chan, & Darko, 2021; Graham, Chow, & Fai, 2018). These maintenance records provide crucial references for subsequent management efforts, aiding personnel in tracking the efficacy of maintenance and making adjustments and improvements when necessary.

Risk Evaluation: A comprehensive risk evaluation is essential for Hui-style architecture and its carved ornamentation. This evaluation involves analyzing potential natural risks, human-made damages, and other factors (Appiotti et al., 2020; Despotaki, Silva, Lagomarsino, Pavlova, & Torres, 2018). Subsequently, corresponding strategies to address these risks are formulated. Through scientific risk evaluation, targeted preventive measures can be implemented to ensure the safety and integrity of carved ornamentation (Paolini et al., 2012).

The formulation and implementation of heritage strategies ensure the continuity and development of carving techniques, while also encouraging active community and public involvement in preservation efforts.

Training & Transmission: By cultivating skilled individuals in the art of transmission, using traditional apprenticeship systems, carving techniques are passed down from one generation to the next, ensuring the constant inheritance and evolution of traditional craftsmanship (Blake, 2018). Training may encompass imparting skills in handcrafting, material selection, restoration methods, and more, enabling the younger generation to proficiently master these skills, thereby laying a solid foundation for the future preservation of carved ornamentation (Achille & Fiorillo, 2022).

Community Involvement: Guiding local communities to actively participate and contribute to the preservation of Hui-style carved ornamentation can enhance community members' awareness and sense of responsibility for preservation (Bleibleh & Awad, 2020). Communities can engage in preserved activities and volunteer services to actively partake in maintenance and restoration efforts, thereby ensuring the continuity and sustainable development of preservation endeavours (Boniotti, 2023).

Educational Promotion: Through exhibitions, lectures, seminars, and other formats, public awareness and importance of Hui-style architectural culture and carved ornamentation can be heightened (Menkshi, Braholli, Çobani, & Shehu, 2021). Strengthening public recognition and understanding of Hui-style carved ornamentation enhances people's understanding of its significance and unique value, thereby fostering societal support for its preservation. By showcasing the value and meaning of carved ornamentation, public interest is ignited, consequently driving societal support and involvement in preservation efforts (Bonacini & Giaccone, 2022).

In addition to these efforts, the government can introduce relevant policies to provide economic and resource support, encouraging and preserving research and inheritance activities related to Hui-style carved ornamentation (Rueda Márquez de la Plata, Cruz Franco, & Ramos Sánchez., 2022). Strengthening the formulation and implementation of cultural heritage preservation laws also plays a pivotal role in promoting the preservation of Hui-style carved ornamentation, given the normative and enforceable nature of these laws (Clark, 2022; Pranajaya & Dwijendra, 2021).

The Significance of Preservation

The significance of preserving and inheriting Hui-style carved ornamentation cannot be ignored. First of all, the preservation of Hui-style carved ornamentation is of practical significance in maintaining historical and cultural heritage. Exquisite Hui-style carved ornamentation embodies the unique charm and artistic value of Huizhou culture, making it a precious heritage of ancient civilization and exquisite craftsmanship (Z. Wang, 2020). By engaging in preservation and heritage work, we can ensure that valuable historical insights and cultural heritage are passed on to future generations, and that the unique qualities of Huizhou culture are understood and appreciated by a wider audience (Silverman & Ruggles, 2007).

Secondly, the protection and inheritance of Hui-style carved ornamentation helps to maintain the diversity of our national culture and the continuation of traditional crafts. As an important part of traditional Chinese culture, Hui-style carved ornamentation has profound aesthetic significance and creativity and is an important part of our cultural heritage (Cen, Rao, Mao, Zheng, & Dong, 2023). By inheriting and innovating the production process of Hui-style carved ornamentation, we can preserve and promote the diversity of our national culture and sustain

and spread it in contemporary society.

In addition, the protection and inheritance of Hui-style carved ornamentation has sustainable value for economic and social development. As a unique art form and cultural symbol, Hui-style carved ornamentation has certain market value and economic potential. Through protection and inheritance, it can create more employment opportunities and promote the development of related industries. At the same time, the inheritance and innovation of Hui-style carved ornamentation will also help to cultivate and develop art-specific talents and promote the prosperity of cultural industries and social progress.

In contemporary times, Hui-style carved ornamentation plays an important role in the protection and inheritance of cultural heritage, artistic creation and architectural design. As a witness of history and culture, Hui-style carved ornamentation carries rich historical information and cultural connotation, which helps people deeply understand and study ancient Huizhou culture. At the same time, Hui-style carved ornamentation also provides valuable references and inspirations for artistic creation, injecting new ideas and elements into contemporary art.

In addition to heritage, Hui-style carved ornamentation is also constantly being innovated. With the changes in society and the development of the times, craftsmen constantly tried new materials, techniques and design elements to meet the needs and aesthetic changes of the times. Through research and practice, they created many new forms of ornamentation and technical skills. These innovations not only enriched the expression of Hui-style carved ornamentation, but also opened up new possibilities for the advancement of craftsmanship. The interaction between craft inheritance and innovation has allowed Hui-style carved ornamentation to continue to develop and evolve. Inheritance preserves traditional skills and culture, enabling Hui-style carved ornamentation to inherit and display the charm of ancient art. Innovation, on the other hand, injects new vigor and creativity into Hui-style carved ornamentation, making it full of modernity and contemporary atmosphere. By studying craft inheritance and innovation, the unique charm and value of Hui-style carved ornamentation can be better understood and appreciated. At the same time, it can provide guidance and support for the protection, inheritance and innovation of the craft. Through craft inheritance, the tradition and essence of Hui-style carved ornamentation will be preserved; through innovation, the development of craft technology and the enrichment of art forms will be promoted. In this way, Hui-style carved ornamentation can move towards a broader future.

Like all studies, this study has some limitations. The historical perspective analyses in this study were only derived from literature analysis and fieldwork, and there was no in-depth data collection for building cases in specific regions. Future research could conduct more in-depth studies and discussions on specific cases or regions. In addition, the material in this study lacks expert argumentative support, this is because the fieldwork for this study was carried out in March-July 2022 and the authors' travelling was restricted by China's epidemic prevention and control policies, so this limits the comprehensiveness and professionalism of the detailed information in the study. Future research could deepen the historical analysis of Hui-style architecture by obtaining more specialized primary data in the form of expert interviews.

In conclusion, the preservation of Hui-style carved ornamentations holds immense importance in safeguarding cultural heritage, promoting the diversity of national cultures, and fostering sustainable economic and societal development. By upholding and advancing the production techniques of Hui-style carved ornamentation, it not only transmits the treasures of history and culture but also fosters innovation and creativity, infusing contemporary society with unique artistic charm and cultural confidence. The preservation and inheritance of Hui-style carved ornamentation necessitate collaborative endeavors from government bodies, experts, scholars, and all segments of society. Through initiatives such as promoting technological inheritance, reinforcing preservation policies, enhancing awareness cultivation, and facilitating publicity and promotion, the invaluable cultural heritage embodied by Hui-style carved ornamentation can be safeguarded, perpetuated, and bequeathed as a cherished legacy of historical import and artistic allure for generations to come.

REFERENCES

- Achille, C., & Fiorillo, F. (2022). Teaching and learning of cultural heritage: Engaging education, professional training, and experimental activities. *Heritage*, 5(3), 2565-2593.
- Adegoriola, M. I., Lai, J. H., Chan, E. H., & Darko, A. (2021). Heritage building maintenance management (HBMM): A bibliometric-qualitative analysis of literature. *Journal of Building Engineering*, 42, 102416.
- Adegoriola, M. I., Lai, J. H., Yung, E. H., & Chan, E. H. (2023). Development of a significant index model for assessing heritage building maintenance management challenges. *Engineering, Construction and Architectural Management* (ahead-of-print). <https://doi.org/10.1108/ECAM-05-2022-0457>
- Adegoriola, M. I., Yung, E. H., Lai, J. H., Chan, E. H., & Yevu, S. K. (2023). Understanding the influencing factors of heritage building maintenance management: Findings from developed and developing regions. *Building Research & Information*, 51(5), 605-624.
- Allmark, P., Boote, J., Chambers, E., Clarke, A., McDonnell, A., Thompson, A., & Tod, A. M. (2009). Ethical issues in the use of in-depth interviews: literature review and discussion. *Research Ethics*, 5(2), 48-54.
- Almssad, A., Almusaed, A., & Homod, R. Z. (2022). Masonry in the context of sustainable buildings: A review of the brick role in architecture. *Sustainability*, 14(22), 14734.
- Angrosino, M., & Rosenberg, J. (2011). Observations on observation. *The Sage Handbook of Qualitative research*, 4, 467-478.
- Appiotti, F., Assumma, V., Bottero, M., Campostrini, P., Datola, G., Lombardi, P., & Rinaldi, E. (2020). Definition of a risk assessment model within a European interoperable database platform (EID) for cultural heritage. *Journal of Cultural Heritage*, 46, 268-277.
- Bao, Y. (2005). *Hui zhou gong yi* [Huizhou crafts]. Hefei, China: An hui ren min chu ban she.
- Blake, J. (2018). Museums and safeguarding intangible cultural heritage—Facilitating participation and strengthening their function in society. *International Journal of Intangible Heritage*, 13(1), 18-32.
- Bleibleh, S., & Awad, J. (2020). Preserving cultural heritage: Shifting paradigms in the face of war, occupation, and identity. *Journal of Cultural Heritage*, 44, 196-203.
- Bonacini, E., & Giaccone, S. C. (2022). Gamification and cultural institutions in cultural heritage promotion: a successful example from Italy. *Cultural trends*, 31(1), 3-22.
- Boniotti, C. (2023). The public-private-people partnership (P4) for cultural heritage management purposes. *Journal of Cultural Heritage Management and Sustainable Development*, 13(1), 1-14.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40.
- Cao, Z. H., & Bin Mustafa, M. (2023). A study of ornamental craftsmanship in doors and windows of Hui-Style architecture: The Huizhou Three Carvings (Brick, Stone, and Wood Carvings). *Buildings*, 13(2).
- Cen, K., Rao, X., Mao, Z., Zheng, X., & Dong, D. (2023). A comparative study on the spatial layout of Hui-style and Wu-style traditional dwellings and their culture based on space syntax. *Sustainability*, 15(16), 12398.
- Chafiq, M., Chaouiki, A., Salghi, R., & Ko, Y. G. (2023). Fabrication of branch-like Aph@LDH-MgO material through organic-inorganic hybrid conjugation for excellent anti-corrosion performance. *Journal of Magnesium and Alloys*, 11(7), 2469-2485.
- Chaouiki, A., Chafiq, M., & Ko, Y. G. (2023). Nature-inspired architecture combining organic-inorganic frameworks: Unique structure and active sites toward a stable anti-corrosion coating. *Applied Materials Today*, 32, 101852.
- Chen, X., & Chen, C. (2022). Hui pai jian zhu yi shu gou cheng biao da tan xi ji she ji ying yong yan jiu [Hui-style architecture art composition expression and design application research]. *She Ji*, 35(01), 24-27.
- Cheng, G., Li, Z., Xia, S., Gao, M., Ye, M., & Shi, T. (2023). Research on the spatial sequence of building facades in Huizhou regional traditional villages. *Buildings*, 13(1).
- Cheng, X., & Han, R. (2023). *Yang zhou yu su zhou chuan tong jian zhu diao shi tu shi gou cheng fen xi* [Compositional analysis of traditional architectural carvings in Yangzhou and Suzhou]. *Bao Zhuang Gong Cheng*, 44(04), 219-232.

- Christopoulos, C., Skodras, A., & Ebrahimi, T. (2000). The JPEG2000 still image coding system: An overview. *IEEE Transactions on Consumer Electronics*, 46(4), 1103-1127.
- Clark, K. (2022). Review issues in preservation policy. *The Historic Environment: Policy & Practice*, 13(4), 547-550.
- Cohen, L., Manion, L., & Morrison, K. (2017). Action research. In *Research methods in education* (pp. 440-456). Abingdon, UK: Routledge.
- Della Torre, S. (2021). Italian perspective on the planned preventive conservation of architectural heritage. *Frontiers of Architectural Research*, 10(1), 108-116.
- Deng, S. (2006). *Zhuan ke xue* [Seal engraving]. Guiyang, China: Gui zhou ren min chu ban she.
- Despotaki, V., Silva, V., Lagomarsino, S., Pavlova, I., & Torres, J. (2018). Evaluation of seismic risk on UNESCO cultural heritage sites in Europe. *International Journal of Architectural Heritage*, 12(7-8), 1231-1244.
- Ding, T. (2010). *Hui zhou fu zhi* [Huizhou Prefectural Records]. Huangshan, China: Huang shan Shu she.
- Dong, L., Zhou, H., Li, H., Liu, F., Zhang, H., & Al-Hussein, M. (2018). Climate chamber experiment-based thermal analysis and design improvement of traditional Huizhou masonry walls. *Sustainability*, 10(3).
- Döringer, S. (2021). 'The problem-centred expert interview'. Combining qualitative interviewing approaches for investigating implicit expert knowledge. *International Journal of Social Research Methodology*, 24(3), 265-278.
- Fan, Y. (2002). *Zhong guo hui pai jian zhu* [Hui-style architecture in China]. Beijing, China: Zhong guo jian zhu gong ye chu ban she.
- Fang, H., Ji, X., Chu, Y., Nie, L., & Wang, J. (2023). Study on skywell shape in Huizhou traditional architecture based on outdoor wind environment simulation. *Sustainability*, 15(10), 8270.
- Farhan, S., Akef, V., & Nasar, Z. (2020). The transformation of the inherited historical urban and architectural characteristics of Al-Najaf's Old City and possible preservation insights. *Frontiers of Architectural Research*, 9(4), 820-836.
- Fox, G. (2023). *Architecture, a technique of environmental governance* (Doctoral dissertation). Retrieved from Proquest Digital Dissertations. (AAT 30314751)
- Gao, R., Liu, J., Shi, Z., Zhang, G., & Yang, W. (2023). Patio design optimization for Huizhou traditional dwellings aimed at daylighting performance improvements. *Buildings*, 13(3), 583.
- Gao, W. (2012). *Anhui hui shang wen shi wen hua* [The culture of Huizhou merchants and scholars in Anhui]. Taipei, China: Da yu chu ban she gu fen you xian gong si.
- Gao, X., Li, Z., & Sun, X. (2023). Relevance between tourist behavior and the spatial environment in Huizhou traditional villages—A case study of Pingshan Village, Yi County, China. *Sustainability*, 15(6), 5016.
- González Martínez, P. (2022). The 'preservation by relocation' of Huizhou vernacular architecture: Shifting notions on the authenticity of rural heritage in China. *International Journal of Heritage Studies*, 28(2), 200-215.
- Graham, K., Chow, L., & Fai, S. (2018). Level of detail, information and accuracy in building information modelling of existing and heritage buildings. *Journal of Cultural Heritage Management and Sustainable Development*, 8(4), 495-507.
- Gu, X. (2021, May). The analysis of architecture design elements of jiangnan traditional residence based on AHP. In *IOP Conference Series: Earth and Environmental Science* (Vol. 768, No. 1, p. 012137). Philadelphia, PA: IOP Publishing.
- Gu, Y. (2009). *Zhong guo chuan tong wen yang tu jian* [Illustrated guide to traditional Chinese tattoos]. Beijing, China: Dong fang chu ban she.
- Guo, B., & Li, P. (2016). *Hui pai diao su de xian zhuang yu fa zhan* [Status and development of Hui-style sculpture]. *Yi Shu Yu She Ji (Li Lun)*, 2(05), 127-129.
- Guo, X. (2015). *Hui zhou wen hua de zhong yao dai biao : hui zhou san diao* [Important representatives of Huizhou culture: The "Huizhou three sculptures"]. *Di Fang Wen Hua Yan Jiu* (02), 2.

- Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcription of interview data always necessary?. *Applied Nursing Research*, 19(1), 38-42.
- Hong, L. (2015). *Min su wen hua shi jiao xia hui zhou san diao bao hu yu chuan cheng yan jiu* [Research on the Protection and Inheritance of Huizhou Three Sculptures under the Perspective of Folk Culture]. *Chi Zi (Upper Middle)* (06), 96-97.
- Hu, X. (2021). *Zhong guo chuan tong wen yang* [Traditional Chinese Patterns]. Wuhan, China: Hua zhong ke ji da xue chu ban she.
- Jiang, E., & Lu, F. (2019). *Hui zhou zhuan diao zai gu min ju zhong de zhuang shi yi shu yan jiu* [Research on the ornamental art of Huizhou brick carving in ancient houses]. *Chong Qing Ke Ji Xue Yuan Xue Bao (She Hui Ke Xue Ban)* (04), 87-90.
- Jiang, J. (1991). *Hui pai jian zhu* [Hui-style architecture]. Shanghai, China: Xue lin chu ban she.
- Jiang, Y. (2015). *Hui zhou san diao de wu zhong dao fa* [Five knife methods of Huizhou three carvings]. *Shang Hai Gong Yi Mei Shu*, (01), 114-115.
- Jin, N. (2007). *Chuan cheng hui pai jian zhu* [Inheriting Hui-style architecture]. Hefei, China: He fei gong ye da xue chu ban she.
- Kapp, P. H. (2019). How intangible cultural heritage can make historic preservation and postindustrial regeneration more sustainable. *Journal of Architectural and Planning Research*, 36(1), 1-14.
- Li, A. (2021). *Zhong guo gu dai da xiang de wen hua yu yi* [The cultural allegory of ancient Chinese elephants]. *Chong Qing Jiao Tong Da Xue Xue bao (She Hui Ke Xue Ban)*, 21(01), 48-53.
- Li, X. (2010). *Diao ke de shou gong yi* [Handicraft of carving]. Ha'erbin, China: Hei long jiang jiao yu chu ban she.
- Li, X., Li, D., Lu, B., & Wang, C. (2008). Fabrication of bioceramic scaffolds with pre-designed internal architecture by gel casting and indirect stereolithography techniques. *Journal of Porous Materials*, 15, 667-671.
- Li, Y. (2022). *Fei wu zhi wen hua yi chan xin xi zi yuan fen lei zu zhi jian gou - yi chuan tong mei shu lei wei li* [Classification and organization of intangible cultural heritage information resources: The case of traditional fine arts]. *Tu Shu Guan Za Zhi*, 41(07), 58-67.
- Li, Y., Zhao, L., Chen, Y., Zhang, N., Fan, H., & Zhang, Z. (2023). 3D LiDAR and multi-technology collaboration for preservation of built heritage in China: A review. *International Journal of Applied Earth Observation and Geoinformation*, 116, 103156.
- Liu, C. (2020). *San wei shu zi hua ji shu yu chuan tong gong yi zai gao xiao jian zhu mo xing ke cheng jiao xue gai ge zhong de ying yong yan jiu* [Research on the application of three-dimensional digital technology and traditional crafts in the teaching reform of architectural modelling course in colleges and universities]. *Xin Xi Ji Lu Cai Liao*, (09), 91-93.
- Liu, H., & Zhang, Q. (2002). *Hui diao yi shu xi bu she ji* [Detailed design of Hui carving art]. Nanning, China: Guang xi mei shu chu ban she.
- Liu, R. (2007). *Gan wu hui pai jian zhu* [Hui-style architecture]. Hefei, China: He fei gong ye da xue chu ban she.
- Liu, X. (2009). *Min jian diao ke* [Folk sculpture]. Beijing, China: Zhong guo wen lian chu ban she.
- Liu, Y., Wang, X., & Su, M. (2023). *Hui zhou chuan tong cun luo li fang cun ci tang qun bao hu fa zhan she ji yan jiu* [Design study on the preservation and development of ancestral halls in Lifang village, a traditional village in Huizhou]. *Shan Xi Jian Zhu*, 49(01), 14-16.
- Liu, Z. (2021). Extraction and mapping of component information of ancient buildings in Huizhou based on UAV technology. *Ecological Informatics*, 66, 101437.
- Lu, G. (2020). *Hui pai jian zhu gang bi su xie-shang ce—Hong cun nan ping lu cun* [Hui-style architecture pen sketches-upper book—Hongcun, Nanping, Lucun]. Shijiazhuang, China: He bei mei shu chu ban she.
- Ma, A. (2018). *Zhong guo gu jian zhu liu da pai* [Six schools of ancient Chinese architecture]. *Zhuan Wa*, (08), 10-14.
- Ma, G., & Tao, S. (2010). *Hui pai san diao de bao hu tan xi* [An analysis of the preservation of Hui-style sculptures]. *Chong Qing Ke Ji Xue Yuan Xue Bao (She Hui Ke Xue Ban)*, (04), 131-132.

- Maliha, M. N., Abu Aisheh, Y. I., Tayeh, B. A., & Almalki, A. (2021). Safety barriers identification, classification, and ways to improve safety performance in the architecture, engineering, and construction (AEC) industry: Review study. *Sustainability*, 13(6), 3316.
- Martinez, P. G. (2022). The 'preservation by relocation' of Huizhou vernacular architecture: Shifting notions on the authenticity of rural heritage in China. *International Journal of Heritage Studies*, 28(2), 200-215.
- Menkshi, E., Braholli, E., Çobani, S., & Shehu, D. (2021). Assessing youth engagement in the preservation and promotion of culture heritage: A case study in Korça city, Albania. *Quaestiones Geographicae*, 40(1), 109-125.
- Minichiello, V., Aroni, R., & Hays, T. N. (2008). *In-depth interviewing: Principles, techniques, analysis*. Frenchs Forest, Australia: Pearson Education Australia.
- Nicholson, L. J. (1986). *Gender and history: The limits of social theory in the age of the family*. New York, NY: Columbia University Press.
- Ochilova, M. B., & Dushaev, A. (2019). The category of relevance: Philosophical analysis. *Theoretical & Applied Science*, (2), 11-14.
- Paolini, A., Vafadari, A., Cesaro, G., Quintero, M. S., Van Balen, K., & Vileikis, O. (2012). *Risk management at heritage sites: A case study of the Petra world heritage site*. Paris, France: UNESCO.
- Pei, Y., Gong, K., & Leng, J. (2020) Study on the inter-village space of a traditional village group in Huizhou region: As an example. *Frontiers of Architectural Research*, 9(3), 588-605.
- Pi, Z., & Jia, Q. (2011). *Hui zhou san diao* [The three carvings of Huizhou]. Nanjing, China: Dong nan da xue chu ban she.
- Pranajaya, I. K., & Dwijendra, N. K. A. (2021). The domination of cultural and symbolic capital in the preservation of temple heritage architecture through a restoration approach in Bali, Indonesia. *Methods*, 3, 23.
- Qi, W., Li, M., Xiao, H., & Zhang, J. (2021). Study on the influence of tourists' value on sustainable development of Huizhou traditional villages—A case of Hongcun and Xidi. In *E3S Web of Conferences* (Vol. 236, p. 03007). <https://doi.org/10.1051/e3sconf/202123603007>
- Rueda Márquez de la Plata, A., Cruz Franco, P. A., & Ramos Sánchez, J. A. (2022). Architectural survey, diagnostic, and constructive analysis strategies for monumental preservation of cultural heritage and sustainable management of tourism. *Buildings*, 12(8), 1156.
- Rutakumwa, R., Mugisha, J. O., Bernays, S., Kabunga, E., Tumwekwase, G., Mbonye, M., & Seeley, J. (2020). Conducting in-depth interviews with and without voice recorders: A comparative analysis. *Qualitative Research*, 20(5), 565-581.
- Shang, Z. (2016). *Zhong guo gu dian jian zhu ji xiang tu an shi bie tu jian* [An illustrated guide to recognizing auspicious patterns in classical Chinese architecture]. Hefei, China: Huang shan guo ji chu ban she you xian gong si.
- Shao, H. (2022). *Chuan tong hui pai jian zhu zhong de zhuang shi yi shu yan jiu* [Research on ornamental arts in traditional Hui-style architecture]. *Xin Mei Yu*, (03), 64-66.
- Shi, S., & Yu, K. (2021) Structural characteristics and contemporary value of traditional water cultural landscapes in Huizhou region. *Landscape Architecture Frontiers*, 9(4), 28-49.
- Shi, S., & Yu, K. (2021). *Hui zhou chuan tong shui wen hua jing guan de jie gou te zheng yu dang dai jia zhi* [Structural characteristics and contemporary value of traditional water culture landscape in Huizhou]. *Jing Guan She Ji Xue (Zhong Ying Wen)*, 9(04), 28-49.
- Showkat, N., & Parveen, H. (2017). In-depth interview. *Quadrant-I (e-text)*, 1-9.
- Shu, Y., Hu, J., Fang, W., Wang, Y., & Ye, Y. (2012). *Yi xian zhi* [Yixian county records]. Huangshan, China: Huang shan Shu she.
- Silverman, H., & Ruggles, D. F. (2007). Cultural heritage and human rights. In *Cultural heritage and human rights* (pp. 3-29). New York, NY: Springer.
- Song, Y., & Liao, C. (2023). Research on the architectural features and artistic elements of traditional buildings in different regions of Jiangxi, China. *Buildings*, 13(7), 1597.
- Sun, Y. (2018). *Shen ling yu zong jiao: Ming qing shi qi hui zhou yu huai bei min jian xin yang zhi bi jiao*

- [Deities and religion: A comparison of folk beliefs between Huizhou and Huaibei in the Ming and Qing dynasties]. *She Hui Ke Xue*, (03), 162-171.
- Tang, J. (2006). *Zhong guo gu dai jian zhu zhuan diao* [Brick sculptures of ancient Chinese architecture]. Nanjing, China: Jiang su mei shu chu ban she.
- Tang, L. (2007). *Su zhou yu hui zhou* [Suzhou and Huizhou]. Beijing, China: Shang wu yin shu guan.
- Timur, B. A., Başaran, T., & İpekoğlu, B. (2023). On-site measurements of temperature and humidity conditions for the comparison of urban and rural sub-spaces of traditional settlements: Historical city of Muğla, Turkey. *International Journal of Architectural Heritage*, 1-19.
- Tomaszek, T. (2022). *Authenticity and wooden architecture preservation in Asia—A Chinese perspective*. Boca Raton, FL: CRC Press.
- Toxey, A. P. (2016). *Materan contradictions: Architecture, preservation and politics*. Abingdon, UK: Routledge.
- Wang, B. (2021). *Hui pai chuan tong jian zhu wen hua yi shu yu ying zao ji fa yan jiu* [Research on Hui-style architecture culture, art and construction techniques]. Changchun, China: Ji lin mei shu chu ban she.
- Wang, G. (1989). *Hui zhou da guan* [The great view of Huizhou]. Shanghai, China: Shang hai ren min mei shu chu ban she.
- Wang, H., & Wang, Y. (2005). *Zhong guo mu diao · zhuan diao · shi diao* [Chinese wood and brick carvings and stone carvings]. Tianjin, China: Tian jin ren min mei shu chu ban she.
- Wang, H. W. (2022). *Lun hui pai jian zhu yu bei fang di yu de rong he* [On the integration of Hui-style architecture and northern territory]. *Jian Zhu Jie Gou*, (03), 153.
- Wang, M. (2014). *Hui pai jian zhu feng yun* [Hui-style architecture style]. Wuhu, China: An hui shi fan da xue chu ban she.
- Wang, R., Ji, W., Liu, M., Wang, X., Weng, J., Deng, S., ... Yuan, C. A. (2018). Review on mining data from multiple data sources. *Pattern Recognition Letters*, 109, 120-128.
- Wang, S. (2008). *Hui zhou lao fang zi* [Old houses of Huizhou]. Nanjing, China: Jiang su mei shu chu ban she.
- Wang, X. (2021). *Jiang nan chuan tong mu diao hua ban de xing zhi jie gou yu zao wu ying yong* [Forms, structures and applications of traditional wood carvings in Jiangnan]. *Xin Mei Shu*, 42(06), 227-234.
- Wang, Z. (2020). *Hui zhou chuan tong jian zhu zhuan diao yan jiu* [Research on brick sculpture of Huizhou traditional architecture] (Master dissertation, Anhui Jianzhu University, Hefei, China). Retrieved from <https://kns.cnki.net/kcms/detail/detail.aspx?FileName=1020304874.nh&DbName=CMFD2021>
- Wong, K. Y., Casey, R. G., & Wahl, F. M. (1982). Document analysis system. *IBM Journal of Research and Development*, 26(6), 647-656.
- Wu, M. (2018). *Zhong guo hui zhou diao ke yi shu—Zhuan diao juan* [Chinese Huizhou sculpture art—brick sculpture volume]. Hefei, China: An hui mei shu chu ban she.
- Wu, M., & van Laar, B. (2021). The Monumentenwacht model for preventive conservation of built heritage: A case study of Monumentenwacht Vlaanderen in Belgium. *Frontiers of Architectural Research*, 10(1), 92-107.
- Wu, S. (1999). *Hui zhou zhuan diao* [Huizhou brick carvings]. Ha'erbin, China: Hei long jiang mei shu chu ban she.
- Yan, M. (1994). *Zhong guo zhuan ke da zi dian* [Dictionary of Chinese seal engraving]. Guiyang, China: Gui zhou jiao yu chu ban she.
- Yu, H. (2000). *Zhong guo hui zhou mu diao—Ren wu ji* [Chinese Huizhou woodcarvings: A collection of figures]. Beijing, China: Wen hua yi shu chu ban she.
- Yuan, S. (2020). *Lun hui zhou san diao de zhi zuo gong yi* [On the production process of Huizhou three carvings]. *Yi Shu Pin Jian* (06), 169-170.
- Zhai, T. (2005). *Hui pai zhuan ke* [Hui-style seal cutting]. Hefei, China: An hui ren min chu ban she.
- Zhang, G. (1999). *Hui zhou mu diao* [Huizhou wood carving]. Ha'erbin, China: Hei long jiang mei shu chu ban she.

- Zhang, Y. (2007). *Zhong guo li dai chuan tong wen yang* [Traditional Chinese patterns through the ages]. Zhengzhou: He nan mei shu chu ban she.
- Zhang, Y. Q. (2023) The ancestral hall and ancestor veneration narrative of a Huizhou lineage in Ming-Qing China. *Journal of Asian Architecture and Building Engineering*, 22(4): 2006-2019.
- Zhang, Z. (2021, October). Research on 3D digital model design of the sparrow brace in Qingcheng ancient town. In *2021 2nd International Conference on Intelligent Design (ICID)* (pp. 278-281). Piscataway, NJ: IEEE.
- Zhao, M., Liang, J., & Lu, S. (2022). Cultural connotation and image dissemination of ancient villages under the environment of ecological civilization: A case study of Huizhou ancient villages. *Journal of Environmental and Public Health*, 2022. <https://doi.org/10.1155/2022/7401144>
- Zhao, S., Guo, H., & Wang, Y. (2015). Ecological environment and traditional craft: Taking Huizhou three carvings as an example. *The Anthropologist*, 21(1-2), 80-88.
- Zhao, Y. (2011). *Si xiang hui zhou* [Ideas of Huizhou]. Hefei, China: An hui da xue chu ban she.
- Zhao, Y. (2015). *Yue du hui zhou* [Reading Huizhou]. Hefei, China: An hui da xue chu ban she.
- Zheng, B., & Sui, J. (2018). Passive cooling influencing factors and formation mechanism analysis of the street space in Huizhou traditional dwellings. *International Journal of Heat and Technology*, 36(4), 1318-1322.
- Zheng, B., Sui, J., Tan, Y., & Zhang, L. (2019). Thermal performance analysis of exterior wall materials of Huizhou residential buildings adapted to local climate. *Annales De Chimie-Science Des Materiaux*, 43(2), 89-94.
- Zheng, J. (2009). *Jie du hui zhou ci tang* [Interpreting Huizhou ancestral halls]. Beijing, China: Dang dai zhong guo chu ban she.
- Zhong, J., Jia, S., & Liu, R. (2019). Improvement of indoor thermal environment in renovated Huizhou architecture. *International Journal of Heat and Technology*, 37(2), 633-640.
- Zhou, X. (2006). *Hui zhou chuan tong xue shu wen hua di li yan jiu* [A geographical study of traditional academic culture in Huizhou]. Hefei, China: An hui ren min chu ban she.
- Zhou, X. G. (2018). *Hui xue yu ming qing shi tan wei* [Exploration of Huizhou studies and Ming and Qing history]. Hefei, China: An hui da xue chu ban she.
- Zhou, Z., Zhu, Q., Liu, D., & Tang, W. (2021). Three-dimensional reconstruction of huizhou landscape combined with multimedia technology and geographic information system. *Mobile Information Systems*, 2021, 1-13.
- Zhu, C., Li, Y., Liu, R., Ji, Z., Zhao, C., Wang, J., . . . Guo, C. (2023). Effects of ambient temperature and humidity on viruses activity on different architectural coatings and kinetics study. *Progress in Organic Coatings*, 183, 107698.
- Zhu, W., & Wei, D. (2022). Micro nanoengraving technology and aesthetic practice of architectural sculpture art. *Journal of Nanomaterials*, 2022. <https://doi.org/10.1155/2022/5845092>
- Zhu, Y. (2005). *Hui zhou jian zhu* [Huizhou architecture]. Hefei, China: An hui ren min chu ban she.
- Zuo, D., Li, C., Lin, M., Chen, P., & Kong, X. (2022). Tourism, residents agent practice and traditional residential landscapes at a cultural heritage site: The case study of Hongcun village, China. *Sustainability*, 14(8), 4423.
- Zuo, G., Liu, R., & Zhang, M. (2011). *Hui zhou jian zhu men chuang diao shi de yi yun jie xi* [Analysis of the meanings of door and window carvings in Huizhou architecture]. *Gong Ye Jian Zhu*, 41(06), 150-153.