

UDC 7.05:008(510.67)

DOI <https://doi.org/10.32782/2415-8151.2025.37.35>

FEATURES OF COLOUR VISUAL IMAGE FORMATION IN THE URBAN SPACE OF SHANDONG PROVINCE WITH CONSIDERATION OF REGIONAL ASPECTS

Xiangyang Li¹, Skliarenko Nataliia Vladyslavivna²

¹ Postgraduate Student at the Department of Graphic Design,
Kyiv National University of Technologies and Design, Kyiv, Ukraine;
Shaanxi University of Science & Technology, Xi'an, People's Republic of China;
e-mail: 205756270@qq.com, orcid: 0009-0008-2253-4181

² Doctor of Study of Art, Professor, Professor at the Department of Architecture and Design,
Lutsk National Technical University, Lutsk, Ukraine,
e-mail: nata_skliarenko@ukr.net, orcid: 0000-0001-9188-1947

Abstract. Purpose. The purpose of this study is to examine the role of colour in the visual image design of cities in Shandong Province based on the analysis of regional characteristics.

Methodology. The study is based on the analysis of collected representative graphic materials from selected cities in Shandong Province using the visual sampling method, which allowed obtaining real visual information about the city. The manual colour extraction method is used to extract the dominant colour in the selected image material from a colour recognition website, record its HEX CODE and name it. Finally, the 'The main theme' colours of 10 cities in Shandong Province were extracted using colour analysis. Based on their art historical analysis, which includes an analysis of colour trends, cultural background, and urban development orientation, their spatial colour characteristics and visual images were highlighted to form a system of colour representation with narrativity and locality.

Results. The study of urban colour characteristics based on regional aspects demonstrates the diversity of urban colours in Shandong Province and explains the importance of colour in urban development. The colour types of cities in Shandong Province are classified and four categories of urban colour system are distinguished: Coastal freshness, Ecologically wilderness type, Cultural warmth type and Comprehensive type. Each type also presents colour structure and visual characteristics that are closely related to the natural geography and cultural background of the local urban area. The results of the study indicate that regional environment and urban characteristics are inextricably linked in the urban colour system.

Scientific novelty. Based on regional aspects, the study proposes for the first time a method for classifying the visual image of urban colours based on geographical environment, history and humanities, and urban functions. Compared with previous studies focusing on the colour of individual urban regions, considerable attention is paid to the visual correlation between the colour structure and the overall unity of urban space, which highlights the aesthetic value and systematic role of the urban colour system.

Practical relevance. The research results provide a clear classification basis and methodological support for the design of urban visual image and related urban colour research. The proposed classification of urban colour systems can provide

designers with effective design guidelines for their visual practice in different cities. In addition, the research contributes to the formation of a more holistic visual space of the city, the enhancement of public identity, and the enhancement of regional content communication to create a more accurate and vivid image of the city.

Keywords: *visual communication design, colour, colour visual image, urban colour system, regional characteristic, sustainable development, urban space, cultural heritage, visual space of the city, national identity, aesthetics, cities in Shandong Province, China.*

INTRODUCTION

As the process of urban construction accelerates, urban colours are increasingly being looked at in the fields of art, design and aesthetics. City colour influences people's first impression of the city, is the key embodiment of the city's history, humanity and modern civilisation, and as one of the most compelling visual signals in the city's image, it has an important role to play in the presentation of the city's appearance and the enhancement of the city's quality. Colour has long been used as a means of expressing cultural identity and continues to carry a sense of place and belonging to the community in the local built environment [12].

The essence of urban colour is a special spatial language, through effective identification and reconciliation, can make the city's unique image of the connotation and humanistic feelings to be transmitted [17]. Unique geographical backgrounds and national cultures carry and nurture each city's own linguistic expressions [13]. Generally speaking, the geographical environment and cultural features of a city tend to influence the direction of its development, giving rise to specific colour tendencies. Therefore, in order to avoid the homogenisation of cities caused by globalisation, the importance of building a city colour system with a high degree of visual identity is obvious, which can inject a unique vitality into the city and enhance its influence.

The effective expression of the city's personality and regional characteristics cannot be separated from the visual expression of the city's colours. However, the rapid development of cities and the phenomenon of haste have made the homogenisation of colour expression in many urban spaces increasingly serious. Urban colours effectively present the visual atmosphere of a space. In the actual practice of visual image design, some cities tend to use standardised design language, so that the deeper regional context in the colour image is ignored, and the lack of regional recognition of the city's visual image is exposed, weakening people's emotional identification with the city, and making the unique urban outlook ineffective to be displayed.

It is an inevitable phenomenon over time that many cities in China attract attention with their deep cultural foundations developed over the years [6]. Many cities in Shandong Province are no exception, most of which have a long history, deep cultural heritage and a certain modern atmosphere. Its urban colours are also influenced by natural geography (e.g. climate and local building materials), human and social environmental factors, and urban positioning [14], which results in a colour image that is different from that of other provinces and regions, and influences people's impressions and evaluations of cities in Shandong Province. Therefore, it is important for the study to analyse the relationship between regional characteristics and urban colour of Shandong Province. Through this research, the path of regional characteristics in the practice of modern urban visual design can be constructed, and provide strong support for the shaping of urban colour image.

ANALYSIS OF RECENT RESEARCH

To date, the scientific study of urban colour has made some progress, and has been the concern of more and more scholars, involving a number of research perspectives.

The researchers first discussed the role of regional characteristics in urban colour construction [4; 14]. They analysed the factors affecting urban regional colours, elaborated on the role of natural, humanistic level social environments and so on in the shaping of urban colours, and explored the methods of extracting and designing regional colours. Articles by scholars such as Xing and Guo [9], Xu and Zeng [18] and Zhang and Guo [19] note the lack of regional characteristics and colour confusion in some cities at present, and they point out the need to consider the local natural environment and historical and cultural background, and to establish a regionally recognizable colour planning system by means of hierarchical control, colour zoning and extraction of the local colour palette, in order to enhance the characteristics of the city. The study by Lu Xu et al. [15] is a little more specific, as they explore the reasons for the formation of urban colours and argue that

urban landscape colours tend to be influenced by the regional climate.

In addition to this, the articles by Ding [1] and Gao and Iqbal [2] emphasise the study of methods for extracting urban colours, which can effectively identify and confirm the colour tone of the city and its characteristics. Ma and Misni [7], on the other hand, systematically collected and analysed the architectural colours of a number of districts in Jinan, Shandong Province, with the help of colour geography theory. They consider the value of urban colour planning methods in preserving cultural heritage and enhancing the aesthetic coherence of cities. The question of whether there are commonalities in dominant hues between different metropolises and the factors that shape them was posed by Jermyn [5]. She argued that despite geographic differences, there are still similarities in the dominant hues of some cities, and that analysing the results of the study is important for creating an urban palette that can guide new urban developments to ensure that new buildings are colour-coordinated and unified with the existing city.

However, the study of urban colour is always aimed at shaping an excellent urban brand image. Mao et al. [8] proposed a method of constructing a brand colour system for a featured town based on the extraction of regional landscape architectural colours. It extracted the natural landscape plants and historical architectural colours, and created a holistic brand visual image containing logos, auxiliary planar graphics, guide systems and cultural and creative products. This effectively improved the brand quality, recognition, and impact of the location.

PURPOSE

This paper intends to explore a method of expressing urban colours based on regional characteristics, focusing on the 'The main theme' colours that can represent the urban image of Shandong Province and the classification of characteristics. The importance and value of this study is also due to these real-life needs. Image collection and data analysis is also an important part of this paper, which provides feasible practical inspiration and theoretical support for the problems of colour design in urban spaces in Shandong Province and other regions.

RESULTS AND DISCUSSION

Colour is the most representative factor to show the beauty of the city and plays an active role in creating a diverse and pleasant urban environment [4]. As an important part of the city's visual image, urban colour assumes an aesthetic

role and has the comprehensive qualities of expressing local traditions, history, humanities and the natural environment, subtly changing the overall spatial atmosphere of the city. Through a variety of media, it is always involved in people's daily life, enriching their visual senses and influencing their emotions. The scientific justification of the colour strategy, taking into account regional characteristics, enhances the city's recognition and cultural charm, therefore, more attention should be paid to shaping the city's image and improving spatial quality.

In a broad sense, urban colour is the sum of colours that various visual things (e.g. natural elements, streets, parks, green areas, etc.) have in the external space of a city [3]. On the other hand, on a narrower level, urban colour is considered as the colour of the human environment with a territorial character, which is constituted by the core of architecture [19]. Geographic location affects the colour expression of a region or city, and is influenced by specific historical, cultural and social factors, resulting in the formation of unique regional colours in the process of long-term social development. This characteristic is not only reflected in the choice and matching of colours, but also in its time-honoured aesthetic traditions, and has become an important clue for identifying the character of the city and regional culture. An excellent regional colour design can fully demonstrate the image of the city, ensure the effective inheritance and shaping of the city's local culture, landscape and collective memory, to provide people with a sense of identity [11].

These urban environmental colour characteristics are particularly evident in cities in Shandong Province, through the clever combination of various colours and with the help of the 'The main theme' colour theory proposed by scholar Song [16; 10], the city has formed a colour naming system with artistic conception, creating a poetic atmosphere that integrates geography and culture, and further clarifying the value of colour as a narrative language medium for conveying regional spirit.

Shandong Province is located on the eastern coast of China and has a diverse geographical environment. There are 16 prefecture-level cities in the province, namely Jinan, Qingdao, Rizhao, Weihai, Yantai, Zibo, Dongying, Binzhou, Weifang, Jining, Taian, Dezhou, Liaocheng, Linyi, Heze and Zaozhuang. These cities are distributed in different locations in the province, and most of them have rich natural resources and deep humanistic and historical heritage, which provide case support for the regional study of urban colour. Figure 1

shows the geographical and district location of Shandong Province in China, and the distribution of cities in terms of their location within the province, with cities used for colour extraction and research analysis marked with black boxes.

This study selected 10 cities within Shandong Province, and the 'The main theme' colours of the visual image of Shandong Province cities were extracted, classified and analysed through the consideration of geographic environment, history and humanity, and urban functions, and some representative colour images were selected for these cities. These colours reflect the visual image of the city's temperament, humanistic and historical traditions and the tone of the natural environment to some extent, and leave a deeper impression in people's minds.

Colours were extracted through the online website www.color-name.com for each image of the selected city. According to the results of the analysis, the urban colour types of cities in Shandong Province were systematized. Four types of urban colour system were identified, such as Coastal Freshness (Table 1), Ecologically Wilderness (Table 2), Cultural Warmth (Table 3) and Comprehensive (Table 4).

The urban colour system of Coastal Freshness has a unique visual expression in Shandong Province. It is jointly influenced by many types of elements such as coastal geomorphology and light, forming a bright, modern urban colour atmosphere in the urban space, which appears extremely open and harmonious. Among the coastal cities in Shandong Province, Qingdao, Rizhao and Weihai are representatives of this type (Table 1).

Under the composition of the 'The main theme' of 'Orange Grove and Sea Sunshine', Qingdao's city colours show a highly unified visual rhythm and a coastal artistic temperament with a

sense of painting and structure. Mandarin, as the emotional keynote of Qingdao's colour, covers the roofs of the German-style buildings, forming a warm melody of rolling tones in the city contour, and supplemented by Palm Leaf-coloured vegetation dotted in the building blocks and mountains. This gives the urban space the character of an ecological visual buffer, combining with the local coastal location, creating "red tiles, green trees, blue sea, blue sky [20]," a highly recognisable city colour image. Pale Pink is the ambient colour of Qingdao's harbour in the evening, oozing out of the sea spray and vistas, painting the whole ambient space with a warm and lingering hue. The Cyan Azure colours are derived from the modern architecture of the coast, steadily building up the visual depth of the city.

Rizhao city's the 'The main theme' colour is named 'Rizhao in Colour', Ripe Mango colour comes from the early morning sunrise on the coastline. Its colour gives people a warm and light visual feeling, forming a 'sunrise first light first light' impression of the city, which is also the origin of the name Rizhao (日照) city. This is also the origin of the name Rizhao. The Gold (Crayola) colour is taken from golden sandy beaches and has a regional texture with a soft temperature in the light. The Gainsboro and Rackley colours are taken from the modern city's visionary architecture, and the overall look is pleasant and comfortable. It is worth mentioning here that Rizhao was founded a short time ago, and these two colours reflect the city's young age. In general, the city colour of Rizhao doesn't bring people a strong visual impact, but exists between the light and the object, naturally generated and has a fresh quality of urban colour expression.

The location of Weihai is a little different from other cities in Shandong Province, and the

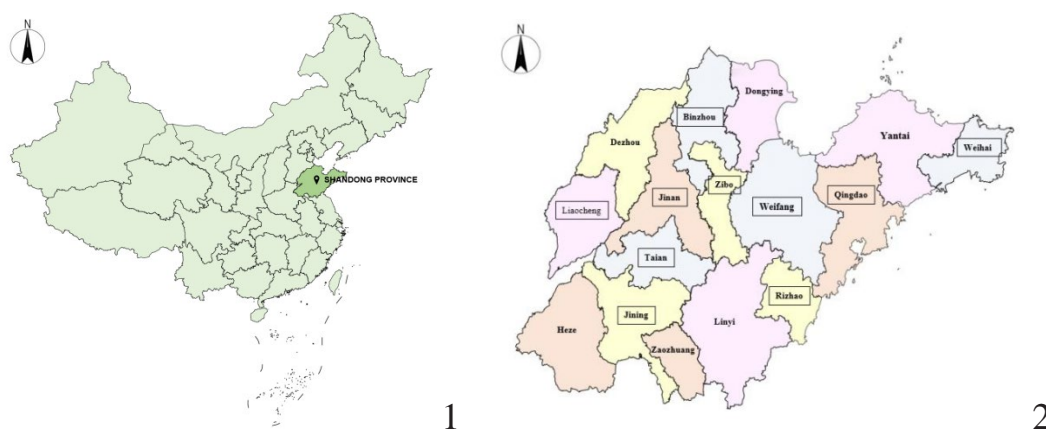


Fig. 1. Geographical and district location of Shandong Province in China:
1 – Shandong Province Location; 2 – Cities in the province

Table 1

Urban colour system Coastal Freshness of the visual image of Shandong Province cities

Classification		Coastal Freshness		
City	Hex Code	Colour Name	Main Theme Colour	
Qingdao	F57746	Mandarin	Orange Grove and Sea Sunshine “橘林海晖”	 
	778D45	Palm Leaf		
	F3DADE	Pale Pink		
	5185A8	Cyan Azure		
Rizhao	FCC626	Ripe Mango	Rizhao in Colour “日照之色”	  
	E2C299	Gold (Crayola)		
	DCDEDD	Gainsboro		
	6294AF	Rackley		
Weihai	CCE1F2	Azureish White	Distant Light on a Quiet Coast “静岸远光”	  
	5A93AF	Rackley		
	D9CAAB	Dark Vanilla		
	307390	Teal Blue		
	898982	Titanium		

Azureish White and Rackley colours are extracted from the winter snowfall, lending a sense of serenity and pure ambience. The Teal Blue colour is a cool colour extension from near sea to far sea, giving a refreshing feeling. The Dark Vanilla colour is dotted between the city buildings, injecting a soft temperature into the impression of blue and white city colours, enriching people's sensory experience. The Titanium colour, on the other hand, is taken from the overall atmosphere at the harbour in the early morning, creating a restrained, warm impression of the city. Weihai's urban colour rhythm is slow and continuous, and its urban colour scheme constitutes a sense of calmness and aesthetics that does not win the battle with noise. Responding to the 'The main theme' of Weihai's urban colours with the 'Distant Light on a Quiet Coast' is a visual response to the tranquillity and order of the coastal lifestyle.

In urban visual image design, the natural environment plays an indispensable role with its value as the source of visual language. For example, designers will abstract the local characteristics of the natural environment elements to deal with, used in the city logo design, reflecting the positioning of the city's development, to trigger people's interest in the city [6], and the same is true in the shaping of the city's colours. The colour expression of the ecological wilderness city is based on its unique natural landscape and ecological structure. The local ecological resources create the texture of the regional urban space and shape the residents' identity with the environment, and Binzhou is a representative city of this type (Table 2).

'The main theme' of the 'Antique Verdigris and Gilded Woods' colour is the ecological wilderness type of city colour in the steady expression, build up the unique colour visual image of Binzhou. The Sunray colour comes from the natural delta of the Yellow River Wetland in Binzhou in autumn, giving the city a vast and rich picture base. Gray and Vermilion (Plochere) colours are extracted from the tile roofs, eaves and wooden pillars of historical buildings such as the Yellow River Building, presenting the deep cultural background of the place to awaken humanistic memories. The Dark Moss Green colour is derived from the vegetation in the natural areas of the city and is the most direct and stable visual expression of Binzhou's eco-city. At the same time the Peach-Yellow colour, which is taken from the facade of the modern building, makes people more familiar with this sense of ecology, brings a warm visual atmosphere and transmits the character of the city.

In the cultural warmth city, Confucian culture is the core element of the composition of this type of city, with a convergent and stable urban visual temperament, a strong humanistic atmosphere. And in the colour expression presents a subtle and orderly aesthetic logic, constituting the city's overall colour tonality. The cities of Jining, Taian and Liaocheng are used as representatives of this type (Table 3).

Jining's urban colours are a blend of ecology and tradition, with a warm visual character. The Slimy Green colour comes from the waters of Weishan Lake, representing natural vitality. The Jasper Orange and Sweet Brown colours are derived from the Confucius Temple

Table 2

Urban colour system Ecologically Wilderness of the visual image of Shandong Province cities


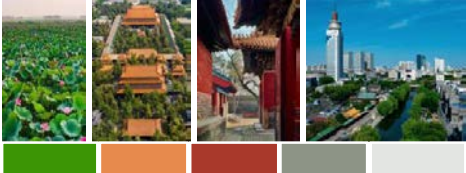


Classification		Ecologically Wilderness		
City	Hex Code	Colour Name	Main Theme Colour	
Binzhou	E0B858	Sunray	Antique Verdigris and Gilded Woods “古黛金森”	
	818086	Gray		
	D92D21	Vermilion (Plochere)		
	F9DEAB	Peach-Yellow		
	45691A	Dark Moss Green		

Table 3

Urban colour system Cultural Warmth of the visual image of Shandong Province cities

Classification		Cultural Warmth		
City	Hex Code	Colour Name	Main Theme Colour	
Jining	3C9505	Slimy Green	Verdant Crimson and Ashen Rhythm “翠丹灰律”	
	E78A4D	Jasper Orange		
	A9392B	Sweet Brown		
	8D9486	Philippine Gray		
	E3E5E2	Platinum		
Taian	9B8D82	Cinereous	Dusky Tones and the Cultural Silhouette of Dai “暮色岱影”	
	6B9A30	Palm Leaf		
	A05542	Coconut		
	C7B38E	Khaki (HTML/CSS)		
	788897	Light Slate Gray		
Liaocheng	AD927F	Grullo	Mist-Tiled Roofs and Lake Murmurs “烟瓦湖声”	
	712F23	Liver (Organ)		
	4E7A97	Jelly Bean Blue		
	BDD3C7	Jet Stream		
	31564C	Dark Slate Gray		

complex, emphasising the ceremonial nature of the urban space and the symbolism of humanity and culture. The Philippine Gray colour of the roof tiles of the historic buildings stabilises the rhythm of the modern city. The Platinum colour, on the other hand, symbolises the spatial transition after the intervention of modern architecture, maintaining the visual articulation between the ancient and the modern. ‘The main theme’ of Jining’s colours is summed up as ‘Verdant Crimson and Ashen Rhythm’, which is an expression of the city’s character and aesthetic norms that have been formed by the city’s long history of Confucian civilisation.

The Cinereous colours of the city of Taian originate from the walls of buildings with a hundred years of history, constituting the temperature and sense of history of the city’s undertones. While the Palm Leaf colours are extracted from the natural vegetation of Taishan Mountain, endowing the city with a solemn ecological boundary. Coconut and Khaki colours are found in ancient buildings such as the Dai

Temple, which is a cultural tradition of religious rituals and history. As the name of the ‘The main theme’ of the colour of Taian, ‘Dusky Tones and the Cultural Silhouette of Dai’ is the most appropriate. The Light Slate Gray colour is derived from the modern architecture of the city’s vistas, extending the transition between historical contexts and contemporary spaces, keeping the city visually characterised by a subtle, orderly and spiritual colour palette.

Liaocheng is a city situated on the water, known as the ‘Venice on the Water in Northern China’, and its urban colours are a blend of water city patterns and historical districts, with a gentle and calm temperament surrounding the urban space. The Grullo and Liver colours are derived from the brick walls and eaves of old buildings, the warm base of the city’s colour vision. The Jelly Bean Blue and Jet Stream colours are extracted from the waters of Dongchang Lake, giving the space a gentle sense of flow. The Dark Slate Gray colour of the tiles on the historic buildings continues to lend historical thickness

to the overall tone of the city and is an important expression of the regional cultural identity. 'The main theme' of the colour 'Mist-Tiled Roofs and Lake Murmurs' combines the hazy imagery of the ancient brickwork and the spatial sense of the lake's reverberation, showing a poetic expression of the city's colours. It is a true reflection of Liaocheng's deep culture and geographical pattern at the visual level.

The urban colour of the comprehensive is not dominated by a single urban culture or natural geographic landscape, but is often formed at the intersection of natural landscapes, history and humanity, and modern renewal. Its colour structure is characterised by inclusiveness and integration. The urban development connotation of 'culture, ecology and function' is reflected in the colours of these cities. The representative cities are Jinan, Weifang and Zibo (Table 4).

The city of Jinan has a gentle and introverted urban temperament, and it is very appropriate to name the 'The main theme' colour of Jinan as 'Serene Tones of the Spring City'. Jinan's colour system also expresses the fusion of both natural and humanistic contexts, with Mountain Meadow colours made up of spring water colours and Copper colours from the walls of old buildings, conveying the temperature of urban life. Davy's Grey is derived from the rooftops of old neighborhoods, and Queen Blue is the cool-toned reflection of the distant views of modern urban buildings. These two types of colours together construct a visual picture of the city where warmth and coolness blend. This set of colours does not pursue ostentatious colour contrasts, but uses subtle brushstrokes to outline

the quiet rhythm and cultural heritage of the city of Jinan, which is nourished by spring water.

Weifang's city colours give a soft and thick visual sense, which continues the temperature of traditional handicrafts, but also gives it an industrial memory and modern context. The Cultured colour on the façade of Weifang's famous landmark sculpture 'Kite Mark (鸢标)' injects a sense of lightness and whiteness into the urban space, which has an initial visual guiding effect and indicates the city's main gentle qualities. The Fawn colours are derived from the walls of old buildings from the 1970s and 1980s, conveying a familiar and warm perception of life in the historic district. Medium Carmine, Silver Foil and Light Gray colours are taken from ancient buildings, which together build a stable rhythm of spatial texture, showing the deeper history and culture of Weifang city. The Platinum colours emerging from the modern vista become a visual extension of the city's constant renewal. Naming the 'The main theme' colour of Weifang as 'Silken Walls and Crimson Tone' is an artistic expression of the visual temperament of the city, which is composed of non-heritage traditions, historical structure and modern order.

Zibo's urban colour constitutes a calm and layered visual language, with an industrial rationality of the city temperament. The Cadmium Purple colour in the mountains and forests in autumn brings a sense of season and natural texture to the city of Zibo, and is one of the warmest of the city's colours. The colours Silver Pink and Tumbleweed are derived from urban public buildings and industrial sites of the 1970s and 1980s, expressing a heavy and restrained

Table 4

Urban colour system Comprehensive of the visual image of Shandong Province cities

Classification		Comprehensive		
City	Hex Code	Colour Name	Main Theme Colour	
Jinan	2CC39E	Mountain Meadow	Serene Tones of the Spring City “泉城静律”	
	DB8963	Copper (Crayola)		
	50545F	Davy's Grey		
	477398	Queen Blue		
Weifang	F9F6F3	Cultured	Silken Walls and Crimson Tone “绢砌丹调”	
	E3B26F	Fawn		
	B9483A	Medium Carmine		
	ABB0B6	Silver Foil		
	CCD8D8	Light Gray		
	E4E2ED	Platinum		
Zibo	BC1625	Cadmium Purple	Autumn Hues and Serene Blue “秋韵静蓝”	
	C6B7AA	Silver Pink		
	DDA48B	Tumbleweed		
	577CA1	Blue Yonder		

spatial order. Blue Yonder, on the other hand, represents rationality in modern visionary architecture. The organic combination of industrial city blue-grey tones and seasonal natural environment tones makes 'Autumn Hues and Serene Blue' the 'The main theme' colour of Zibo, conveying the tension of the city in the cultural deposition and transformation of the times.

Therefore, behind each type of colour lies the relationship between the city and nature, history and modernity. As an important part of the city's visual image, colour is not only a medium for people's aesthetic perception, but also a visual expression of regional characteristics. The regional characteristics make the city colour more specific visual content, which gives the city a distinctive personality and recognition.

CONCLUSIONS

Urban colour is not only an artistic presentation of aesthetics, but also an external expression of local natural landscape and human history. In this study, urban colours in Shandong Province are classified into four types of urban colour system, namely coastal freshness, ecological wilderness, cultural warmth and comprehensive, from the regional aspect. This classification not only reveals the relationship between urban colour and regional space, but also clarifies the important role of colour as a visual medium in cultural communication and identity construction in urban space. It has been proven that the regional environment has an important influence on urban colour, and through the refinement and application of regional colours, it helps to enhance the value and spatial quality of the city, becomes a key stroke in enhancing the soft power of the city and spreading the spirit of the city. Urban colour palette contributes to the formation of a distinctive and powerful city brand in the midst of fierce global competition.

BIBLIOGRAPHY

- [1] Ding M. Quantitative contrast of urban agglomeration colors based on image clustering algorithm: Case study of the Xia-Zhang-Quan metropolitan area. *Frontiers of Architectural Research*. 2021. Vol. 10(3). P. 692-700. DOI: <https://doi.org/10.1016/j.foar.2021.05.003>
- [2] Gao C., Iqbal J. An empirical study of Thailand cities' color landscapes. *Heliyon*. 2023. Vol. 9(6). P. e17558. DOI: <https://doi.org/10.1016/j.heliyon.2023.e17558>
- [3] Gasparini K. Urban Color Plan: The case study of the Ledro Valley (Italy). *Color Research & Application*. 2024. Vol. 49(6). P. 618-634. DOI: <https://doi.org/10.1002/col.22947>
- [4] Gorzaldini M. N. The Effects of Colors on the Quality of Urban Appearance. *Mediterranean Journal of*

Social Sciences. 2016. Vol. 7(5). P. 225. URL: <https://www.richtmann.org/journal/index.php/mjss/article/view/9455> (access date: 24.07.2025).

- [5] Jermyn J. A Comparison of Extracted Dominant Colours of Twelve Cosmopolitan Cities. *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*. 2022. Vol. 10(3). P. 1569-1582. DOI: <https://doi.org/10.22214/ijraset.2022.40934>

- [6] Li X., Skliarenko N. Aspects of the Chinese regional culture in the city visual image design (based on the logos of the Shandong Province Cities). *Art and Design*. 2024. Vol. 2. P. 32-43. DOI: <https://doi.org/10.30857/2617-0272.2024.2.3>

- [7] Ma Y., Misni A. Evaluating the urban architectural colour status of Jinan, China from the perspective of colour geography. *Planning Malaysia*. 2024. Vol. 22(34). DOI: <https://doi.org/10.21837/pm.v22i34.1644>

- [8] Mao F., Zhao P., Zhu Z. Construction of Characteristic Town Brand Color Systems: Color Extraction Based on Regional Landscape Architecture. In *E3S Web Conf. 3rd International Conference on Energy Resources and Sustainable Development (ICERSD 2020)*. 2021. Vol. 236. 03037. DOI: <https://doi.org/10.1051/e3sconf/202123603037>

- [9] Xing Z., Guo W. Addressing cities' color issues and planning urban colors with regional features to preserve the history and culture of cities: the case of Suzhou, Wuxi, and Changzhou (China). *Journal of Asian Architecture and Building Engineering*. 2024. Vol. 1-13. DOI: <https://doi.org/10.1080/13467581.2024.2399686>

- [10] Xu J. A linguistic approach to urban color design and research—Exploring Jianming Song's methodologies. *Color Research & Application*. 2023. Vol. 48(5). P. 612-621. DOI: <https://doi.org/10.1002/col.22849>

- [11] Xu Z., Zheng X. Roadmap of moving urban colour toward cultural sustainability in China. *Color Research & Application*. 2021. Vol. 46(1). P. 222-239. DOI: <https://doi.org/10.1002/col.22578>

- [12] Yu B., Bell S. Emerging colours: new trends, demands and challenges in contemporary urban environments. *Cultura e Scienza del Colore-Color Culture and Science*. 2020. Vol. 12(01). P. 32-39. DOI: <https://doi.org/10.23738/CCSJ.120104>

- [13] Zhang S., Liu Y., Nie H. Geographical Feature based Research on Urban Color Environment – Taking Wuhan as an Example. *IERI Procedia*. 2014. Vol. 9. P. 190-195. DOI: <https://doi.org/10.1016/j.ieri.2014.09.061>

- [14] Liu S., Yu X. 城市地域性色彩影响因素分析 [Analysis of the influencing factors of urban regional color]. *Journal of Jiujiang University (Social Science Edition)*. 2019. Vol. 38(2). P. 93-96. DOI: <https://doi.org/10.19717/j.cnki.jjus.2019.02.023>

- [15] Lu X., Qin H., Wang Z. 寒地城市哈尔滨的城市色彩特征研究 [Urban color characteristics of cold city Harbin]. *Chinese Landscape Architecture*. 2017. Vol. 33(2). P. 43-47. DOI: <https://doi.org/10.3969/j.issn.1000-6664.2017.02.009>

- [16] Song J. 杭州的色彩表情—杭州城市色彩规划实践心得 [The colorful expression of Hangzhou – On the color designing of Hangzhou]. *Public Art*. 2010. Vol. 2. P. 28-34. URL: <https://d.wanfangdata.com.cn/periodical/Ch9QZXJpb2RpY2FsQ0hJTmV3UzIwMjUwMTE2MTYzNjE0EhdRS0MyMDEwMjAxMzExMjUwMDAwNTM1NxoIdjFycmU3cXU%3D> (access date: 24.07.2025)

[17] Song M. 城市色彩与城市形象视觉识别系统的构建—以葡萄牙波尔图的城市形象设计为例 [Urban color and the construction of urban image visual identity system – A case study of Porto, Portugal]. *Journal of Shandong University of Art and Design*. 2015. Vol. 4. P. 71-74. DOI: <https://doi.org/10.3969/j.issn.1671-606X.2015.04.007>

[18] Xu Q., Zeng L. 基于地域特色的城市色彩规划方法探究—以桂林市为例 [Research on the method of urban color planning based on regional characteristics – Take Guilin City as an example]. *Housing Science*. 2019. Vol. 39(12). P. 9-13+19. DOI: <https://doi.org/10.13626/j.cnki.hs.2019.12.002>

[19] Zhang H., Guo J. 体现地域性的城市色彩规划体系构建与实施对策 [Embodiment of regional urban color planning system construction and implementation of countermeasures]. *Urban Development Studies*. 2016. Vol. 23(8). P. 17-21+32. DOI: <https://doi.org/10.3969/j.issn.1006-3862.2016.08.022>

[20] Zhang P., Yang Q., Mou Y., Chen J. 青岛城市色彩演变特征与规划引导 [Urban color landscape zoning and planning guidance of Tsingtao]. *Modern Urban Research*. 2011. Vol. 26(6). P. 56-60. DOI: <https://doi.org/10.3969/j.issn.1009-6000.2011.06.011>

REFERENCES

[1] Ding, M. (2021). Quantitative contrast of urban agglomeration colors based on image clustering algorithm: Case study of the Xia-Zhang-Quan metropolitan area. *Frontiers of Architectural Research*, 10(3), 692–700. <https://doi.org/10.1016/j.foar.2021.05.003> [in English].

[2] Gao, C., & Iqbal, J. (2023). An empirical study of Thailand cities' color landscapes. *Heliyon*, 9(6), e17558. <https://doi.org/10.1016/j.heliyon.2023.e17558>

[3] Gasparini, K. (2024). Urban Color Plan: The case study of the Ledro Valley (Italy). *Color Research & Application*, 49(6), 618–634. <https://doi.org/10.1002/col.22947> [in English].

[4] Gorzaldini, M. N. (2016). The Effects of Colors on the Quality of Urban Appearance. *Mediterranean Journal of Social Sciences*, 7(5), 225. Retrieved from <https://www.richtmann.org/journal/index.php/mjss/article/view/9455> [in English].

[5] Jermyn, J. (2022). A Comparison of Extracted Dominant Colours of Twelve Cosmopolitan Cities. *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*, 10(3), 1569–1582. <https://doi.org/10.22214/ijraset.2022.40934> [in English].

[6] Li, X., & Skliarenko, N. (2024). Aspects of the Chinese regional culture in the city visual image design (based on the logos of the Shandong Province Cities). *Art and Design*, (2), 32–43. <https://doi.org/10.30857/2617-0272.2024.2.3> [in English].

[7] Ma, Y., & Misni, A. (2024). Evaluating the urban architectural colour status of Jinan, China from the perspective of colour geography. *Planning Malaysia*, 22(34). <https://doi.org/10.21837/pm.v22i34.1644> [in English].

[8] Mao, F., Zhao, P., & Zhu, Z. (2021). Construction of Characteristic Town Brand Color Systems: Color Extraction Based on Regional Landscape Architecture. In *E3S Web Conf. 3rd International Conference on Energy Resources and Sustainable Development (ICERSD 2020)* (Vol. 236, 03037). <https://doi.org/10.1051/e3sconf/202123603037> [in English].

[9] Xing, Z., & Guo, W. (2024). Addressing cities' color issues and planning urban colors with regional

features to preserve the history and culture of cities: the case of Suzhou, Wuxi, and Changzhou (China). *Journal of Asian Architecture and Building Engineering*, 1–13. <https://doi.org/10.1080/13467581.2024.2399686> [in English].

[10] Xu, J. (2023). A linguistic approach to urban color design and research—Exploring Jianming Song's methodologies. *Color Research & Application*, 48(5), 612–621. <https://doi.org/10.1002/col.22849> [in English].

[11] Xu, Z., & Zheng, X. (2021). Roadmap of moving urban colour toward cultural sustainability in China. *Color Research & Application*, 46(1), 222–239. <https://doi.org/10.1002/col.22578> [in English].

[12] Yu, B., & Bell, S. (2020). Emerging colours: new trends, demands and challenges in contemporary urban environments. *Cultura e Scienza del Colore-Color Culture and Science*, 12(01), 32–39. <https://doi.org/10.23738/CCSJ.120104> [in English].

[13] Zhang, S., Liu, Y., & Nie, H. (2014). Geographical Feature based Research on Urban Color Environment – Taking Wuhan as an Example. *IERI Procedia*, 9, 190–195. <https://doi.org/10.1016/j.ieri.2014.09.061> [in English].

[14] Liu, S., & Yu, X. (2019). 城市地域性色彩影响因素分析 [Analysis of the influencing factors of urban regional color]. *Journal of Jiujiang University (Social Science Edition)*, 38(2), 93–96. <https://doi.org/10.19717/j.cnki.jjus.2019.02.023> [in Chinese].

[15] Lu, X., Qin, H., & Wang, Z. (2017). 寒地城市哈尔滨的城市色彩特征研究 [Urban color characteristics of cold city Harbin]. *Chinese Landscape Architecture*, 33(2), 43–47. <https://doi.org/10.3969/j.issn.1000-6664.2017.02.009> [in Chinese].

[16] Song, J. (2010). 杭州的色彩表情—杭州城市色彩规划实践心得 [The colorful expression of Hangzhou – On the color designing of Hangzhou]. *Public Art*, (2), 28–34. Retrieved from: <https://d.wanfangdata.com.cn/periodical/Ch9QZXJpb2RpY2FsQ0hJTMv3UzIwMjUwMTE2MTYzNjE0EhdRS0MyMDEwMjAxMzExMjUwMDAwNTM1NxoIdjFycmU3cXU%3D> [in Chinese].

[17] Song, M. (2015). 城市色彩与城市形象视觉识别系统的构建—以葡萄牙波尔图的城市形象设计为例 [Urban color and the construction of urban image visual identity system – A case study of Porto, Portugal]. *Journal of Shandong University of Art and Design*, (4), 71–74. <https://doi.org/10.3969/j.issn.1671-606X.2015.04.007> [in Chinese].

[18] Xu, Q., & Zeng, L. (2019). 基于地域特色的城市色彩规划方法探究—以桂林市为例 [Research on the method of urban color planning based on regional characteristics – Take Guilin City as an example]. *Housing Science*, 39(12), 9–13+19. <https://doi.org/10.13626/j.cnki.hs.2019.12.002> [in Chinese].

[19] Zhang, H., & Guo, J. (2016). 体现地域性的城市色彩规划体系构建与实施对策 [Embodiment of regional urban color planning system construction and implementation of countermeasures]. *Urban Development Studies*, 23(8), 17–21+32. <https://doi.org/10.3969/j.issn.1006-3862.2016.08.022> [in Chinese].

[20] Zhang, P., Yang, Q., Mou, Y., & Chen, J. (2011). 青岛城市色彩演变特征与规划引导 [Urban color landscape zoning and planning guidance of Tsingtao]. *Modern Urban Research*, 26(6), 56–60. <https://doi.org/10.3969/j.issn.1009-6000.2011.06.011> [in Chinese].

АНОТАЦІЯ

Лі Сян'ян, Скляренко Н. В. Особливості формування кольорового візуального образу в міському просторі провінції Шаньдун з урахуванням регіональних аспектів.

Метою цього дослідження є вивчення ролі кольору в дизайні візуального образу міст провінції Шаньдун на основі аналізу регіональних характеристик.

Методологія. Дослідження ґрунтується на аналізі зібраних репрезентативних графічних матеріалів з вибраних міст провінції Шаньдун за допомогою методу візуальної вибірки, що дозволив отримати реальну візуальну інформацію про місто. Метод ручного вилучення кольору використовується для визначення домінуючого кольору у вибраному графічному матеріалі з веб-сайту розпізнавання кольорів, запису його шістнадцяткового коду та надання йому назви. Нарешті, використовуючи метод аналізу кольору, визначені основні колірні теми 10 міст провінції Шаньдун. На основі їх мистецтвознавчого аналізу, що включає аналіз кольорових трендів, культурного походження та орієнтації міського розвитку, виділено просторові колірні характеристики та візуальні образи з метою формування системи візуалізації кольорів з акцентом на наративність та локальність.

Результати. Дослідження характеристик міських кольорів на основі регіональних аспектів демонструє різноманітність міських кольорів у провінції Шаньдун та пояснює важливість кольору в міському розвитку. Класифіковано типи кольорів міст провінції Шаньдун та виділено чотири категорії урбаністичних колірних систем: тип прибережна свіжість, екологічно дикий тип, тип культурної теплоти та комплексний тип. Кожен тип представляє колірну структуру та візуальні характеристики, які тісно пов'язані з природною географією та культурним фоном місцевої міської території. Результати дослідження вказують на те, що регіональне середовище та міські характеристики нерозривно пов'язані в урбаністичній колірній системі.

Наукова новизна. ґрунтуючись на регіональних аспектах, у дослідженні вперше запропоновано метод класифікації візуального образу міських кольорів на основі географічного середовища, історії, гуманітарних наук, а також міських функцій. Порівняно з попередніми дослідженнями, зосередженими на кольорі окремих міських регіонів, приділено значну увагу візуальній кореляції між колірною структурою та загальною єдністю міського простору, що підкреслює естетичну цінність та систематичну роль урбаністичної колірної системи.

Практична значущість. Результати дослідження забезпечують чітку класифікаційну основу та методологічну підтримку для дизайну візуального образу міст та пов'язаних з ним досліджень міського кольору. Запропонована класифікація урбаністичних колірних систем може надати дизайнерам ефективні дизайнерські орієнтири для візуальної практики у різних містах. Крім того, дослідження сприяє формуванню більш цілісного візуального простору міста, посиленню національної ідентичності та покращенню комунікації регіонального змісту для створення точнішого та яскравішого образу міста.

Ключові слова: дизайн візуальної комунікації, колір, кольоровий візуальний образ, урбаністична колірна система, регіональна характеристика, сталий розвиток, міський простір, культурна спадщина, візуальний простір міста, національна ідентичність, естетика, міста провінції Шаньдун, Китай.

АВТОРСЬКА ДОВІДКА:

Сян'ян Лі, аспірант кафедри графічного дизайну, Київський національний університет технологій та дизайну, Київ, Україна; Шеньсійський університет науки і технологій, Сіань, Китай. e-mail: 205756270@qq.com, orcid: 0009-0008-2253-4181.

Скляренко Наталія, доктор мистецтвознавства, професор, професор кафедри архітектури та дизайну, Луцький національний технічний університет, Луцьк, Україна, e-mail: nata_skliarenko@ukr.net, orcid: 0000-0001-9188-1947.

Стаття подана до редакції 24.07.2025 р.
Стаття прийнята до опублікування 05.09.2025 р.
Стаття опублікована 30.10.2025 р.