

# A Study on the Typeface Design method of Han Characters imitated Tangut

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**Abstract.** The Western Xia (1038-1227) was an ethnic regime in the northwest of China during the Song and Liao dynasties. Tangut is the concentrated expression of Tangut culture and Tangut art. It is the language used by the Xiang clan of Tangut party. The typography design of Chinese characters imitating the Tangut style is a new field of Chinese character typography design, which not only conveys the basic shape and meaning of Chinese characters, but also shows the beauty of blending with the aesthetic scale of Tangut style characters. Based on the analysis of the characteristics of Tangut characters in ancient books, this paper summarizes the characteristics of stroke structure with typical "Tangut style", and studies and explores the methods and rules of font design of Chinese characters imitating Tangut style combining with design practice.

**Keywords:** Tangut; Typography; Design methods.

## 1. Introduction

China is a country with a vast territory and numerous nationalities. The Western Xia dynasty was an ethnic regime in the northwest of China during the Song and Liao dynasties, whose territory was roughly in the southwest of the Mongolian Plateau and north of the Qilian Mountains. Tangut is the concentrated expression of Tangut culture and Tangut art. It is the language used by Tangut Dangxiang nationality.

Nowadays, Han characters are the universal characters in China, and their font design is particularly important. Font design is divided into creative font design and typography (Also known as font library font design). The former is usually based on individual characters' visual creativity and has low Requirements for font legibility. Typography is often designed for more than 6,700 Chinese characters in the font library, which requires unity, recognition and promotion.

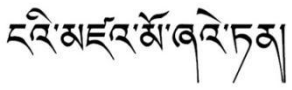
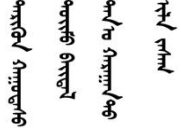
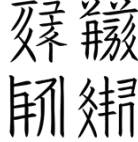
At present, there is a lack of typographical design of Chinese characters imitating the Tangut style. This design practice refers to reasonably integrating the morphological characteristics of Tangut characters based on maintaining the recognizability of Chinese characters, which can not only show the unique features of Tangut culture circle, but also expand the scope of using Chinese characters in different backgrounds.

The typographic design of Tibetan and other Chinese characters has been mature and widely used, but the typographic design of Tangut style is in a very short stage at present. The reasons for this situation are as follows: First, from the technical point of view of font design, the appearance and construction of Tibetan characters are very different from Chinese characters, while the Appearance and construction of Tangut characters are similar to Chinese characters (Table 1), and the design of partial structure is often more complicated. Secondly, from the perspective of history and culture, compared with the Tibetan culture, the Influence of the Xixia culture circle is weak, and it pays less attention to font design. Thirdly, from the perspective of practicality, Tibetan and other ethnic minority characters have been used so far, and local people have a high demand for the use of Chinese characters imitated by ethnic characters, which not only retain the local cultural characteristics, but also can be recognized by most people. However, the mass base of Tangut is relatively weak, so the value of Chinese font design imitated by Tangut lies in highlighting regional characteristics and aesthetic needs.

It is necessary to imitate Tangut Chinese printing font design. As an important carrier of Tangut culture, Tangut has high regional representativeness and aesthetic implication. In addition to the

basic function of accurately conveying information, the typographic design of Chinese characters imprinted in Tangut also caters to the aesthetic needs of the public, presenting a highly imaginative and impacting visual language, and providing a new way of text expression and design possibility for the local cultural and creative industry.

Table 1 A comparison of Tibetan, Mongolian and Tangut

Tibetan	Mongolian	Tangut
		
Tibetan and Mongolian languages are very different from Chinese characters in terms of vision. Chinese characters are block characters, while Tibetan and Mongolian languages are letters glued together to form meaning groups.		The Tangut script is not much different from The Chinese characters visually. Both characters are square characters, and the Tangut script is modeled after the Chinese characters.













## 2. Related work

### 2.1 Analysis of Han characters

The analysis of the characteristics and construction elements of Chinese characters is the breakthrough point of design. At present, it is widely held that Chinese characters can be divided into two types: creating new characters and transforming old ones. Pictographs, referential, epistemic, and Sound visualization in "Six Books" (Ancient Chinese books) are the methods of creating new characters, while hypothecating and annotating are the methods of transforming characters.

Pictographs, referential and epistemic are all derived from pictures (Table 2). Sound visualization is composed of symbols and consonants to form a character. Picophonetics is derived from hypothecation. Hypothecation is the use of words as phonetic symbols to produce phonetic symbols, plus ideographic symbols to form Picophonetics.

Table 2 Examples of pictography, referential and epistemic

	Song typeface	Oracle	Jin typeface	Seal typeface
Pictography	Sun			
	Moon			
	Eye			
Referential	On			
	Under			
	Higher			
Epistemic	Cut			
	Rosperity			
	Sleep			

Most modern Chinese characters are made up of 36 commonly used strokes, the smallest unit of Chinese characters. Modern Chinese characters are divided into single character and combined character. Single character is a Chinese character composed of strokes as a direct unit. In the design of Tangut, it is necessary to start from the design of single character and radical, and then synthesize the combined character.

There are four basic structural forms of Chinese characters: integral structure, left and right structure, upper and lower structure and surrounding structure. Chinese Character Information Dictionary has made statistics on the structure of 7,786 Chinese characters, and the results are shown in the following table (Table 3):

Table 3 Statistical table of four types of constructions  
 in Chinese Character Information Dictionary

Structure type	The overall structure	About structure	Upper and lower structure	Surrounded by structure	Total
Number of words	323	5055	1654	753	7785
The proportion	4.2%	64.9%	21.2%	9.7%	100%

In the design process, the consideration of Chinese character frequency can improve the efficiency of design. The cumulative frequency of the First 100 characters is 47.34%, the accumulated frequency of the 101st to the 1000th is 91.37%, And the accumulated frequency of the 1101 to the 2418 is 99.00%. That is to say, The design of the first 2,418 characters meets the vast majority of the use.

## 2.2 Analysis of Tangut

Before Li Yuanhao, king Jingzong of the Western Xia Dynasty, officially declared himself emperor, he appointed Ye Li Renrong, a minister, to create the Western Xia characters, which borrowed the basic strokes and character construction methods of Chinese characters, and was a new ideographic block character that was independent of Chinese characters and closely related to Chinese characters in form. Now, from the perspective of philology, experts such as Shi Jinbo and Nishida Ryuxiong have made a relatively complete combing of the form, sound and meaning of Tangut, forming a relatively complete disciplinary system.

In the design of Chinese characters imitating Tangut characters, we should fully understand the characteristics and rules of character construction of Tangut characters. Like the single characters of Chinese characters, the number of simple characters is small, and the majority of synthetic characters. Synthetic word is more than two words synthesis of a word, three or four words synthesis of a word accounted for less. The biggest characteristic of Tangut script is that there are many arranged strokes and oblique strokes without vertical hook strokes, so special attention should be paid to the imitation design process. In the consideration of stroke structure, on the basis of not affecting the basic recognition of Chinese characters, we can basically get the Chinese character font design with the characteristics of Tangut by combining the deformation with the structural characteristics of Tangut. There are at least 1 and at most 12 radicals in Tangut characters. The strokes and structures of these basic radicals are shown in the following table (Table 4).



According to the existing characters of tangut, a large number of observation and summary of tangut, find the most characteristics of strokes and structures of tangut, the characteristics of strokes and structure of the Tangut characters are as follows. First, in the form of the same stroke, the use

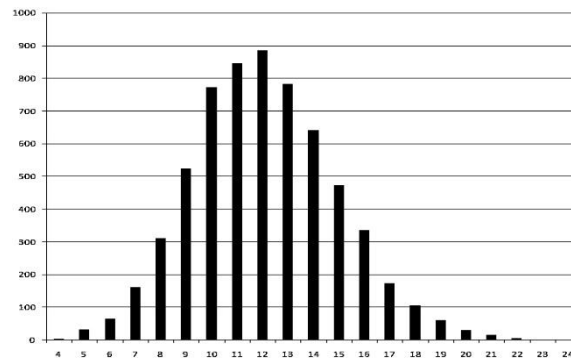


Fig. 1 Statistics of distribution of Tangut calligraphy and painting

of repeated typesetting. For example, a stroke is a horizontal stroke, which is usually composed of up and down superimposed twice or three times, as well as vertical strokes and oblique strokes. Second, the overlapping oblique pen is the most prominent feature of the Tangut characters. All the Tangut characters with the superposition of penning ‘ ’ account for more than 90% of the existing Tangut characters. Thirdly, the Tangut characters are complicated and complicated. Most of the numbers are more than 10 strokes, and most of the numbers are 12 strokes (Figure 1). Fourth, there is no vertical hook strokes, and different forms of vertical hook strokes appear more often and have the characteristics of the Tangut.

### 3. Typeface Design methodology

Take "Nankai University College of Arts visual Communication Design" thirteen words as an example to imitate the Tangut style design. The main reasons for choosing these characters are as follows: First, these characters contain 12 common strokes, which are representative to a certain extent; Second, these characters contain two types of Chinese characters: single character and combined character, which are suitable for classifying and explaining the basic situation of Chinese character font design. Thirdly, the combination of these characters has the superposition of single character and radical, which is suitable for explaining the scientific nature of the design steps. Fourth, the strokes of these characters are quite different, with a maximum of nine strokes and at least three strokes, which are used to show the effect of different strokes in the imitation of txixia characters.

Before the design of western Xixia style fonts, two basic design principles should be clarified first: one is to ensure the recognizability of Chinese characters in the text. That is to say, it does not require a character to have a strong recognizability, but requires a character to have a strong recognizability in its environment, because the imitation of txixia characters will modify strokes on the basis of a character, which itself is easy to cause the weakening of the recognizability of Chinese characters; The second is to ensure the accurate expression of the characteristics of Tangut writing and painting, in order to achieve the purpose of imitating Tangut design.

After clarifying the two basic principles, according to the above sorting and summary of Tangut characters, the common Chinese strokes are first designed to imitate Tangut characters. There are 36 strokes commonly used in Chinese characters, which are designed one by one according to the structural characteristics of Tangut style (Table 5)

Table 5 Part of Han strokes imitating Tangut design

Stroke	Imitation of Tangut design
一	一 =
丨	丨 し 卜 匕 彳
	乚 匕
丶	丶
丿	ノ ク 夕
	㇇ 久
冂	冂 冂 ㇇ ㇇
丨	丨 丨 丨
	㇇ ㇇
乚	し 匕 乚 匕
	フ ラ ク
㇇	㇇ ㇇

After the preliminary completion of Chinese stroke design, according to the classification of Chinese characters, the design of single character and complex character is carried out respectively. Before the design of complex character, the design of single character and radical should be carried out first, that is to say, the design of single character and radical should be carried out first, then the complex character is synthesized, and the complex character is adjusted appropriately.

Single character in Chinese characters has its own characteristics, a character is a whole and cannot be divided, single character is the basis of complex character, in the design process, should take full account of single character in the increase and change of strokes on the influence of recognition and aesthetics. According to the characteristics of strokes of Tangut characters, strokes should be added as much as possible without affecting the recognizability. Especially the oblique pen for repeated arrangement and stacking; Many kinds of vertical curved hook strokes are applied; And appropriate adjustment and modification, adapt to the word density and proportion. (Figure 2).

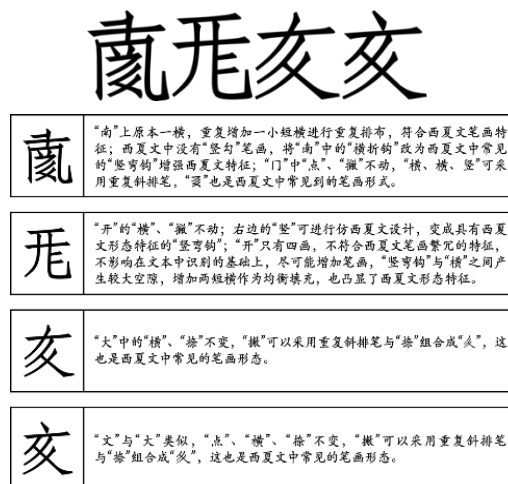


Fig. 2 ‘Nan, Kai, Da, Wen’

Four Han Characters design in imitation of Tangut

Next, eight fit characters of "School of Visual Communication Design" are designed. It should be noted that the design of some single characters and radicals can be directly inspired from the radicals of Xixia, or even directly borrowed. When it is impossible to borrow, it can be made new according to the strokes of the Chinese characters themselves and the rules summed up. On the basis of the designed single character, radical radical, combined design and adjustment (Figure 3).

<b>學院觀覺禛該</b>	
<b>學</b>	西夏文笔画结构复杂,参照繁体字的某些笔画元素,进行适当的结合。“学”采用繁体字的“学”字头,符合重复排笔、撇接交叉;“子”的上半部分不变,“竖勾”变为“竖”,因为整个字的上半部较重,采用两“竖”,既平衡了文字,又增加了笔画。
<b>院</b>	“左耳旁”的“横撇弯钩”可直接采用西夏文中类似的笔画,“竖”可进行重复排布,组合成“𠂇”;“完”的上半部分不变,下半部分“元”的“撇”可进行重复斜笔排布。
<b>觀</b>	“观”的“衣字旁”“点”、“竖”不变,“横撇”的“撇”可重复排笔,右下的“点”可增加一“点”,起到平衡结构的作用;“见”采用繁体字的思路,将里面的“横”变为交叉的“撇捺”结构,下面“儿”的“撇”进行重复排笔。
<b>覺</b>	“觉”的“学”字头采用繁体字的“学”字头;“见”在“观”中已经设计过,直接调整其尺寸,组合成新字。
<b>禛</b>	“禛”的“单立人”,可以对“撇”、“竖”进行重复排笔,并加上“点”与“撇”组成西夏文笔画中的常见形态;对“专”的“横”进行重复排笔,并不影响汉字的可识别性。
<b>該</b>	“该”的“走之底”可以对西夏文部首进行替换,将“横折折撇”的“折”去掉,用“撇”的重复排笔代替;“大”在之前设计过,直接改变尺寸套用即可。

Fig. 3 ‘Xue, Yuan, Shi, Jue, Chuan, Da’  
Five Han Characters design in imitation of Tangut

After the design is completed (Figure 4), each word needs to be screened one by one. How can we judge that the font design of a single Chinese character imitating Tangut is successful? According to the two basic principles at the beginning of the design, the first step is to put the designed characters into the text to see if they can be accurately recognized. The second step is to compare the designed characters with the Tangut characters to see if they are awkward. If they can be compatible with other Tangut characters, the purpose of the design will be achieved.

**亂朮亥學交學院觀覺禛該**

Fig. 4 "Visual Communication Design of Nankai University College of Arts" Han  
Characters design in imitation of Tangut

#### 4. Summary

Due to the fact that Tangut is similar to Chinese characters in history and shape and structure, as well as the decline and even extinction of tangut culture circle in modern times, its own cultural influence is relatively weak, which makes it impossible for people in the cultural circle of Chinese characters to imitate the image presented by the font design of Tangut Chinese characters. The vast majority of people can be said to have never seen tangut script, in the commercial and cultural application of the promotion of a certain degree of resistance.

In this way, the application environment of the tangut Chinese font design is worth discussing. From the perspective of Chinese character culture circle, the Chinese character font design imitating the Western Xia style enriches the visual language of Chinese characters, expands more creative writing space, and creates a font visual image that meets the actual needs and has unique vitality. In today's pursuit of diversified value orientation, an exotic font design that has never appeared in people's visual memory makes people's eyes shine and has a strong personality performance. In addition, the typeface design can also be provided to some people who are interested in using of xixia culture, such as computer and print the words on the input, surrounding the imitation tangut

characters font design extends the wen gen products, etc., when use, people will pursue the root cause of this font design, resulting in a further exploration and understanding of xixia culture.

For xixia culture, the use of tangut language is age and the reality is not allowed, imitation of tangut characters font design to a certain extent can highlight the local characteristics, as far as possible keep the characteristics of xixia character itself, to a certain extent have played an important role in reviving regional culture, become a kind of visual expression of local culture. For example, in local museums, cultural centers and other foreign exhibition venues, such font design can be applied to exhibition display printing or venue guidance system, which can show people the unique local cultural flavor without hindering people's recognition. The application of this font is also conducive to the establishment of the local image of local enterprises, conducive to the cultural promotion of local brands, as one of the important marks that distinguishes local brands from other, and guide more people to understand the Tangut culture.

## Acknowledgement

Supported by the Shanghai Municipal Science and Technology Major Project (2021SHZDZX0100) and the Fundamental Research Funds for the Central Universities

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