

Exploring new methods of digital font design for an extinct script: the case of the Tangut script



Introduction

The Tangut script, used by the Tangut (Xixia) Empire (11th-13th century) in China, became extinct after the fall of the empire.

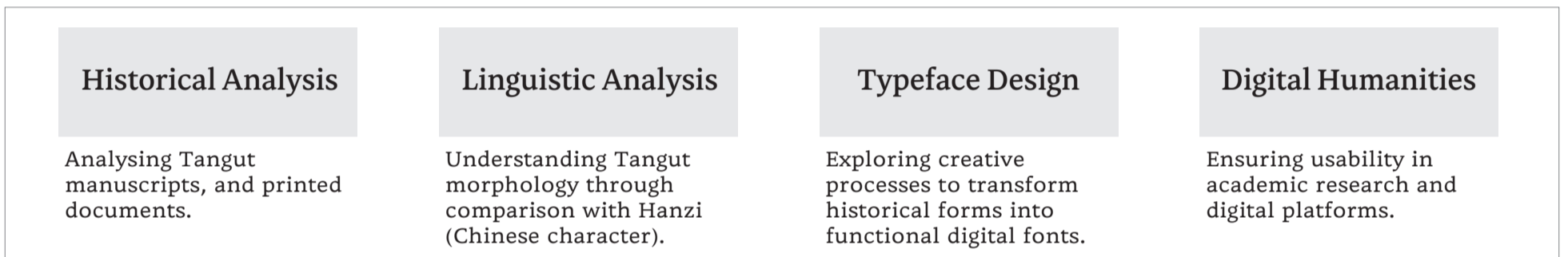
As a unique writing system with over 6,000 characters, Tangut script poses significant challenges for digital revival.

This research explores how creative design strategies can help revive extinct scripts for modern use.

Research question

How can effective insights into historical forms and approaches to digital font design in the Tangut script, with its limited typographic tradition, be systematically extracted from archival sources and applied to contemporary digital environments?

Research framework combining:



Tangut Script analysis

<p>Strong visual links to Hanzi influenced the design analysis process.</p> <p>Hanzi Tangut script</p>	<p>Distinctive components and features different from Hanzi.</p> <p>Semi-enclose structure</p> <p>Semi-semi-enclose structure</p>	<p>Historical documents provided guidance for stroke appearance and character proportions.</p>
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Creative process of font development

<p>Step 1: Archival research and Tangut morphology analysis.</p>	<p>Step 2: Find the reference character.</p>	<p>Step 3: Digital development (not simply scanning) with multiple creative design decisions according to the morphology analysis.</p>																		
<p>Step 4: Iterative testing for readability and practical use in multi-script environments.</p> <table border="1"> <tr> <td>FZShuSong</td> <td>西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》</td> </tr> <tr> <td>SimSun</td> <td>西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》</td> </tr> <tr> <td>BabelStone Han</td> <td>西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》</td> </tr> <tr> <td>Adobe Song Std L</td> <td>西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》</td> </tr> <tr> <td>MS Mincho</td> <td>西夏語と西夏𗵑文字、文字要素, 笔画。「吉祥遍至口和本续」</td> </tr> <tr> <td>Ryumin</td> <td>西夏語と西夏𗵑文字、文字要素, 笔画。「吉祥遍至口和本续」</td> </tr> <tr> <td>FZKai</td> <td>西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》</td> </tr> <tr> <td>Times New Roman</td> <td>Tangut language 𗵑 and script, strokes. <i>The Auspicious Tantra of All-Reaching Union</i></td> </tr> <tr> <td>Cambria</td> <td>Tangut language 𗵑 and script, strokes. <i>The Auspicious Tantra of All-Reaching Union</i></td> </tr> </table>		FZShuSong	西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》	SimSun	西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》	BabelStone Han	西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》	Adobe Song Std L	西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》	MS Mincho	西夏語と西夏𗵑文字、文字要素, 笔画。「吉祥遍至口和本续」	Ryumin	西夏語と西夏𗵑文字、文字要素, 笔画。「吉祥遍至口和本续」	FZKai	西夏语和西夏𗵑文字、文字要素, 笔画。《吉祥遍至口和本续》	Times New Roman	Tangut language 𗵑 and script, strokes. <i>The Auspicious Tantra of All-Reaching Union</i>	Cambria	Tangut language 𗵑 and script, strokes. <i>The Auspicious Tantra of All-Reaching Union</i>	<p>Step 5: Revise and go back to Step 4 to test.</p>
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Interdisciplinary collaboration

Collaboration with linguists ensured that the revived Tangut script retains its linguistic accuracy.

Digital applications

The developed Tangut fonts are adapted for academic research, enabling accurate Tangut text representation in digital media and educational resources.

Impact and future research

This framework offers a model for reviving other extinct scripts like Khitan and Old Uyghur.

Demonstrates how creativity can drive interdisciplinary innovation in preserving cultural heritage.

Reference

Images are from the British library, *Homophones, Xixia documents collected in China vol.16*, and *Taiping Huanyuji*.