

Enhancing the experience of the Western Xia Imperial Tombs heritage site (PRC, Ningxia) through animated installations

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2018

Luo, S.-S., Shedd, B. A., & Nanetti, A. (2018). Enhancing the experience of the Western Xia Imperial Tombs heritage site (PRC, Ningxia) through animated installations. *SCIRES-IT : SCientific RESearch and Information Technology*, 8(1), 1-32. doi:10.2423/i22394303v8n1p1

<https://hdl.handle.net/10356/104702>

<https://doi.org/10.2423/i22394303v8n1p1>

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of the first part of the Chinese name Dang Xiang of the main ethnic group within the state of Xia, as it appears also in *The Travels of Marco Polo* where the word *Tangut* is recorded as the plural of the Mongol term *Tang* (Marco Polo 1982, 707). “Although the etymology of the name has not been yet established³, the Mongol explanation cannot be accepted” according to Luc Kwanten (1982, 55).

As mentioned by Nancy Shatzman Steinhardt (1992, 379, footnote 3), “one can consult the index of John Andrew Boyle, trans., *Successors of Genghis Khan*, [by Rashid al-Din,] (New York and London, 1971) for the many references to the Tanguts”⁴.

Some scholars propose that a tribe of the Qiang nation may be the lineal ancestor of Tanguts on the basis of the fact that they both share the same culture (Li & Bai 2003, 449; Gu 1980; Yang 1956). Others link the origin of the Tangut people to the Xianbei people (Wu 2009, 10-11; Tang 1955).

The Tibetans called the Tanguts *Mi-nyag* (Beckwith 2009, 172; Li & Bai 2003, 450; Stein 1972, 70-71). The Tanguts themselves provide evidence of four self-appellations: *Mi* and *Mi-niaw* are used in common language texts; *Lhiwe* and *Lhiwe-ndzei* are used in the ritual language (Kepping 2001, 37).

The Tangut were allies of the Tuyuhun and extended their territories towards the intersection of the current Gansu, Qinghai and Sichuan provinces during the 7th century CE. Threatened by the conquering Tibetans, the Tanguts moved from the north of the Qinghai-Tibet plateau to the southern banks of the Yellow River and around 631 asked permission to the Tang emperor to enter the Tang empire territory before settling definitely around Yinchuan (Li 2005, 74; Zhang-Goldberg 2012, 48).

After the anti-Tang rebellion led by An Lushan and Shi Siming (755-763), the Tanguts crossed the Yellow River, and the Tang emperor gave them permission to settle down on what is currently the Loess plateau (Bao 2011, 97). Towards the end of the Tang dynasty the Tanguts increased their power. At the beginning of the Northern Song dynasty, they took advantage of the internal wars within the Song territories and gained control of the middle and upper Yellow River.

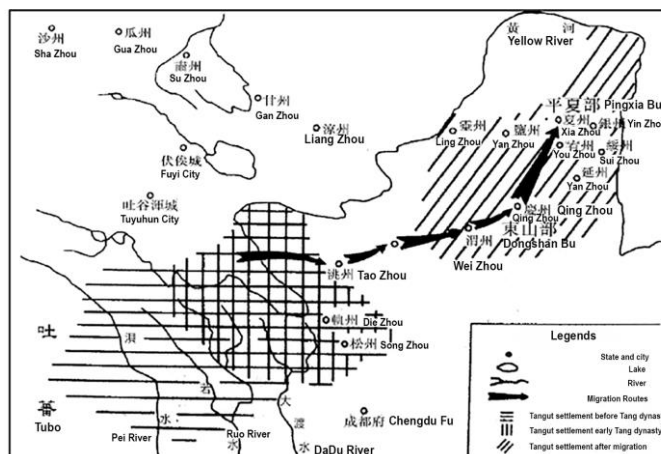


Fig. 1: Map of the seventh-century migration of the Tangut people from the north of the Qinghai-Tibet plateau to the southern banks of the Yellow River (Li 2005, 84).

In 1020, Li (or Zhao) Deming (984[?]-1032, elevated to 太宗 / tài-zōng by Yuanhao⁵) the sovereign of the Tangut people, founded his capital city and called it Xing Zhou (i.e., New City, which today is the downtown area of Yinchuan, in emulation of Bian Liang, the capital of the Northern Song dynasty, according to Li & Bai 2003, 479). The merchants from the East and the West continued to stream into the territory of the Xia, thus bringing and sharing a wide variety of goods and different ideas (Li & Bai 2003, 569; Li 2005, 671-675).

Li Deming’s son, Li Yuanhao (b. 1003), after his coronation (reign 1032-1048) changed the imperial family name from Li (the family name of Tang royal household, Shatzman Steinhardt 1992, 369) into Wei-ming, a native Tangut name (纛纛 in Tangut, Tong 2010, 88; Dunnel & College 1994, 101, with footnote 53 for the primary sources: Nevskiy 1960, 48-49, and Wu 1983, 30-33), and renamed the capital city Xing Zhou into Xingqing Fu (Li 2005, 148; Shi 2005, 1095). In 1038, Yuanhao, officially proclaimed himself emperor (纛纛 / Wuzu in Tangut; Zhang-Goldberg 2012, 48, footnote 10), founded the “Great Xia” (夏鞞 in Tangut, Li 2005, 3, on the basis of Men’shikov 1984, 500, 502, 505; in today’s simplified Mandarin 大夏 / dà xià, Shi 1986, 4; Li & Bai 2003, 482), also call “Great State of White and Lofty” (祥尾纛鞞 in Tangut, Li 2005, 3, on the basis of

³ See also the entry “Tanguts” in the *Encyclopaedia of Asian History* (1988).

⁴ See also Rashīd al-Dīn 1971, Rashīd al-Dīn 1995, and Rashīd al-Dīn 2014.

⁵ Li Yuanhao (reign 1032-1048), after having started the construction of the mausolea for his grandfather (Li Jiqian,

963-1004) and father (Li Deming), followed the tradition of the Tang and other Chinese dynasties to name Taizu and Taizong their founder and son respectively (Shatzman Steinhardt 1992, 369 and 370-371).

Wang 1932, 266, and Li 1984, 29; in today's simplified Mandarin 大白高国 / dà bái gāo guó, Xu 2000, 274-277), and started the construction of mausolea for his grandfather and father (Shatzman Steinhardt 1992, 369, and 370-373). Great Xia was called Western Xia by the Song emperors because of its geographical position to the west of the Northern Song dynasty (Li & Bai 2003, 482; Shatzman Steinhardt 1992, 369).

Shen Kuo in his *Dream Pool Essays* reports that "In the Baoyuan year (1038-1039), the Tangut crossed the border many times, [the Song dynasty] recruited a new army [that they] named *Wansheng* [10,000-time-winner], however this army which never fought before had no time for training, thus when it encountered the enemy it was always defeated" (Shen Kuo 1956, 462: 宝元中, 党项犯塞, 时新募万胜军, 未习战陈, 遇寇多北).

In 1041, an armed force of the Northern Song dynasty attacked Western Xia. It is recorded that an army of 100,000 soldiers led by Yuanhao ambushed it at Haoshuichuan and 100,000 Song soldiers were killed. Even if this battle did not grant to Yuanhao the official recognition of emperor of Western Xia, the Song emperor had to accept the de facto independence of this neighbour state (Shi 2005, 1155; Su and Ma 2014, 323; for both the source is Tuo 1990b).

In 1044, the Northern Song accepted to negotiate a peace with Western Xia (Shi 2007, 6). According to the historiographical work completed in 1183 by the Northern Song dynasty historian Li Tao (1115-1184), "In the Yiwei year (1044), the emperor conferred Yuanhao the title of Lord of the Kingdom of Xia... .. and allocated border markets within the districts of Bao'an Protectorate [today's Zhidan County, Shaanxi Province] and Gaoping Stockade [today's Guyuan city in Ningxia Autonomous Region], and did not allow them to have lake salts⁶ communicate through them" (English translation and identification of the place names by Michael

Stanley Baker, Nanyang Technological University Singapore, based on Li Tao 1985, 3723: 乙未, 冊命元昊為夏國主... .. 置榷場於保安軍及高平寨, 第不通青鹽)⁷.



Fig. 2: Historical map of the Northern Song dynasty drawn by Luo Shen-Shen with the locations of the Gaoping Stockade (blue triangle) 36.0882 經度: 106.2826 (精確值) in Ningxia Hui Autonomous Region and Bao'an protectorate (outlined in blue) 36.8229 經度: 108.7773 (精確值) in Shaanxi, as identified by Michael Stanley-Baker.

Under Yuanhao, Western Xia adopted characters based on strokes to write its own language (Shi 1986, 12-22; Kychanov 1996, 228-230; Li 2005, 151). In the later period of Renxiao (1139-1193), Confucianism (Li 2006, 26-32; Shi 1986, 117-127) and Buddhism (Shi 1986, 64-74; Shi 1995, 51-88; Dunnell 1993, 228; Shi 1988, Shatzman Steinhardt 1997; Shi 2007, II, 546-623; Solonin 2014) flourished in Western Xia. Religious texts were translated into the Tangut language. The Tangut "venerated the Buddha together with Confucius, creating an organic combination between spiritual solace and political practice" (Shi 2014, Abstract).

According to Han Xiaomang, after Buddhism, Taoism was the second most important religion in Western Xia. He finds the reason in concomitant internal and external elements: Taoism has similarities with the traditional Tangut shamanism, and during Tang and Song dynasties

⁶ According to the "Tangut law code" (1987-1989), the salt trade was a state monopole (Shi 2007, I, 154, based on the Mandarin translation by Shi, Nie & Bai 1994, 566).

⁷ For the historical context, see Li 2005 and Shi 2007. The locations of the town of Gaoping Stockade and the Bao'an protectorate were identified by Michael-Stanley Baker using the ability to combine the points provided by the Dharma Drum Buddhist Place Name Authority Database (<http://authority.dila.edu.tw/place>, accessed on April 27, 2018) with the online tools of DocuSky's Geoport (<http://docusky.digital.ntu.edu.tw/docusky/docuTools/Geo>

Port accessed on April 27, 2018), which is based at National Taiwan University's Centre for Digital Humanities Research. The backdrop map is from Academia Sinica's regional time-period Song map: 北宋歷史地圖 [Northern Song dynasty historical map] 1111 <http://gis.sinica.edu.tw/ccts/file-exists.php?img=ad1111-png-{z}-{x}-{y}> accessed on April 27, 2018. Generated by 中華文明之時空基礎架構 [The Space-time Infrastructure of Chinese Civilisation] WMTS service. Reference from 譚其驤先生中國歷史地圖集 [Tan Qichen, *Chinese Historical Atlas*].

the Chinese emperors highly priced Taoism (Han 1988, 58-59; Shi 2007, II, 624-629).

In 1227, after the death of Genghis Khan the Mongol army besieged Xingqing Fu. The people pledged to fight to the death in defending their country until Weiming Xian, the last emperor, surrendered (Hartog 2004, 135; Li 2005, 338), after having had a period of one month to transfer a considerable number of imperial family members and other people (Li & Bai 2003, 507).

The Mongol army sacked the site and completely subjugated the Tanguts, and this seems to have marked the end of Western Xia (Li & Bai 2003, 507). As a consequence, the Tangut culture and language seem to have gradually disappeared from the historical landscape for three concurrent reasons.

1. The Western Xia dynasty did not have official historiographers (Li 2005, 8).
2. The Mongols intentionally deleted as much as possible of Western Xia's memories and identity (Shatzman Steinhardt 1992, 369).
3. The Han Chinese, since the contemporary Northern Song dynasty, and the Yuan dynasty provide very few historiographical records of Western Xia and the Tangut people (Li 2005, 4; Qian 2015).

In 1909, at the archaeological site of Khara-Khoto (黑水城 / *hēi shuǐ chéng*, i.e., Black River City in Mongolian, at the mouth of the Edzin-Gol river at the southern edge of the Gobi Desert)⁸, the Russian expedition led by Pyotr Kuzmich Kozlov found a large number of Western Xia documents that contributed to identify the area as the site in which the Western Xia dynasty established the so-called “Yan Army Office of the Khara-Khoto” to control the market place (Kozloff 1909-1910; Kozlov 1923; Kozlov 1955, 383; Kyrgabov 1995, 39-44; Shatzman Steinhardt 1992, 369;

documents translated into Mandarin, “Documents of Khara-Khoto” 1996)⁹.

The German pilot Wulf-Diether Graf zu Castell-Rüdenhausen (1905-1980) captured the first photograph of the Western Xia mausoleums during his *Chinaflug* expedition (1933-1936) published in 1938 (p. 185 and pl. 114). The archaeological site was then recognised as the burial area of the imperial family of the Western Xia dynasty (1038-1227).

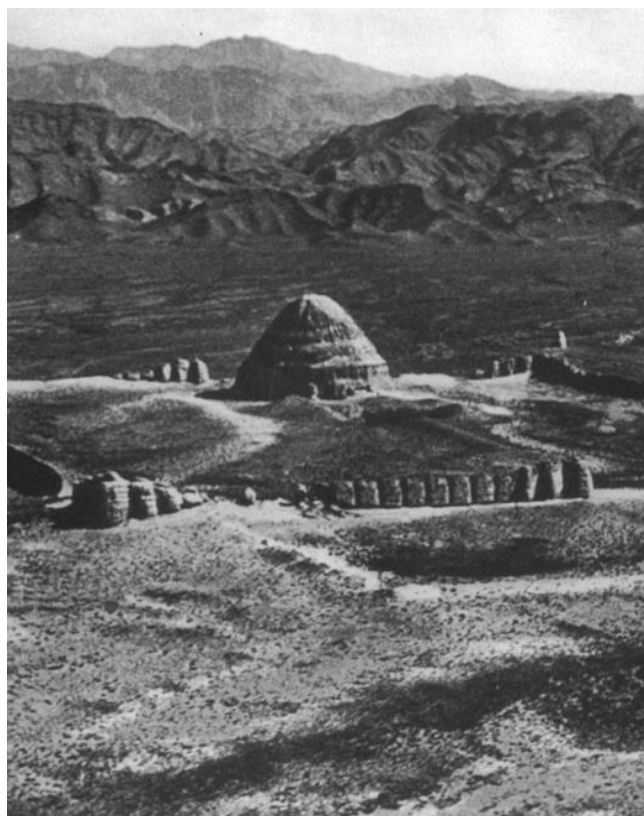


Fig. 3: The archaeological site of Western Xia Imperial Tombs. Detail of Tomb 1, that hypothetically belongs to Yunhao's grandfather Li Jiqian (963-1004) (Shatzman Steinhardt 1992, 371). Aerial photo taken by Wulf-Diether Graf zu Castell-Rüdenhausen (Wulf 1938, p. 185 and pl. 114).

⁸ Khara-Khoto is located 15 miles southeast of today's town of Dalaihubu (Shatzman Steinhardt 1992, 369 and 379, footnote 4 for bibliographical references in Russian and English).

⁹ Chinese scholarship claims the primacy in the recognition of Western Xia archaeological relics, because in 1804, in a Buddhist temple at Wuwei in the Gansu region, the Chinese scholar Zhang Shu discovered a stele with a bilingual inscription (in Chinese and another unknown language, which he hypothetically recognised as Tangut) that he dated 1094 on the basis of the Chinese text (Zhang 1837, Vol. 19s; Devéria 1897, 489; Devéria 1898; Li 2005, 16; Wu 2011, 209). Even if the Qing dynasty scholar He Ling was the first who succeeded in deciphering some Tangut characters (mainly numbers) in the Buddhist *Lotus Sutra* (Nevskiy 1932, 391; He 1986, 53; Li,

2005, 32), and Gérard Morisse, an interpreter at the French Embassy to China, after having purchased in 1900 the three-volume *Lotus Sutra* annotated by He Ling (Morisse 1904; Nevskiy 1960, I, 22; He 1986, 53; Li 2005, 32; Kychanov 2005, 162-163), was “able to provide the pronunciation and the meaning of a small number of Tangut characters as well as a sketchy grammatical outline” (Kwanten 1982, 57); “the discovery of the dead city of Khara-Khoto in 1907-1908 by Ts. Badmazhapov and P. K. Kozlov ... marked a turning point in the then nascent field of Tangut studies. The Tangut ‘dictionary of 1190, ‘a jewel in a palm which meets the needs of the time’, printed as xylograph, significantly eased the difficulty of deciphering Tangut writing” (Kychanov 2005, 163).

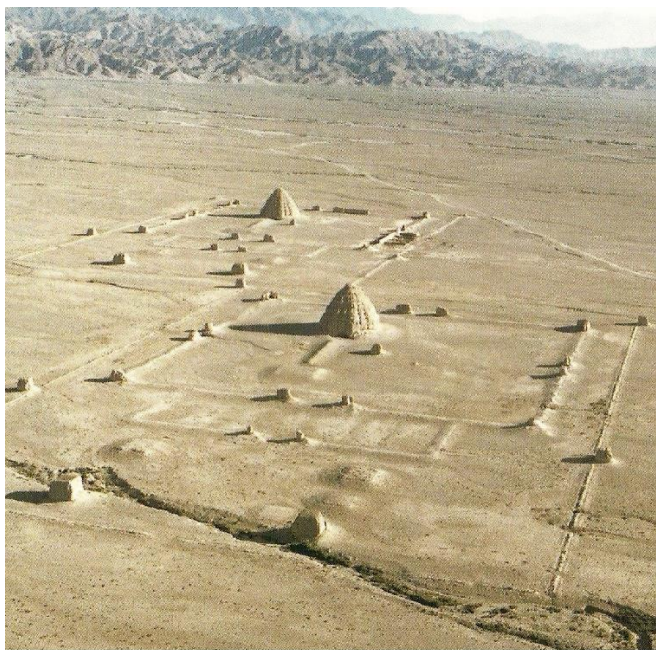


Fig. 4: The archaeological site of Western Xia Imperial Tombs. Aerial photograph of Tombs 1 and 2, that hypothetically belong to Yunhao's grandfather Li Jiqian (963-1004) and his son Li Deming (984[?]-1032) (Shatzman Steinhardt 1992, 371). Image from Zhang-Goldberg 2012, 49 (retrieved from Tang 2003, 102; reproduced also in Li 2005, p. 651), who states that the only one which can be attributed to someone with certainty is Tomb 7 (belonging to Renxiao).

One of the pioneers in Tangut studies was the Russian scholar Evgenij Ivanovich Kychanov (1932-2013), whose academic life and works have been recently investigated by Irina F. Popova (2014). In 1992, Nancy Shatzman Steinhardt provided a detailed story of the (re)discovery of the site (1992, 369; Shi 2005, 2556).

2. A Collaborative Project of the Yinchuan Municipal Government, Beijing Top Production Co., Ltd., and the School of Art, Design and Media of Nanyang Technological University Singapore

In 1988, the Western Xia Imperial Tombs became part of the "Major Historical and Cultural Site" listed at the national level in China ("State Council of the PRC" 2014, No. 248):

- 西夏陵 / xī xià líng (Western Xia Tombs);
- 西夏 / xī xià (Western Xia);
- 宁夏回族自治区银川市 / níng xià huí zú zì zhì qū yín chuān shì (Ningxia Hui Autonomous Region, Yinchuan City).

In 2014, the Beijing Top Production Co. Ltd. (BTP), under the leadership of its CEO Jin Tiemu, consulted several experts on the history of

Western Xia in China, and at the Institute of Oriental Studies of the Russian Academy of Sciences in St. Petersburg to research the Western Xia documents relating to the historical site of Khara-Khoto (Fan and Zhang 2011; and the "Documents of Khara-Khoto" 1996). The BTP research was based on Khara-Khoto's Western Xia documents, the scholarly books published by Shi Jinbo (1986, 1988, 1995, 2005) and the popularizations of the Western Xia history written by Tang Rongyao (2006, 2013, 2015).

On the basis of this research, in August 2014, BTP made also a film with title *Mysterious Tangut* directed by Jin Tiemu himself and produced by Hu Zhanfan and Cai Guoying.



Fig. 5: Screenshot of the trailer of the film *Mysterious Tangut* made by Beijing Top Production Co. Ltd. in August 2014 (director Jin T., produced by Hu Z. and Cai G.).

In January 2015, the municipal government of Yinchuan (the capital of the Ningxia Hui Autonomous Region, PRC) and the administration of the Museum of the Western Xia Imperial Tombs started the preparation to apply for the UNESCO World Heritage List. From this perspective, the administration felt that the existing museum seemed to become obsolete and the idea was to build a new one in the suburb of Yinchuan, on the east side of the archaeological site of the Western Xia Imperial Tombs.

On 23 March 2015, the BTP film *Mysterious Tangut* was broadcast for the first time by the Science & Education Channel of the China Central Television.

In November 2015, BTP, in agreement with the Museum of the Western Xia Imperial Tombs, signed a research collaboration agreement to entrust the School of Art, Design and Media of

Nanyang Technological University Singapore (ADM-NTU) with the undertaking of research on “Animated installations and other creative solutions to increase cultural heritage experiences in the underground time corridor of Xixia/Western Xia Tomb Museum (Yinchuan, Ningxia Hui Autonomous Region, PRC)”. In February 2016, ADM-NTU successfully delivered the concept design for the underground tunnel to BTP¹⁰.

3. Cultural-Heritage-Based Concept Design

Our cultural-heritage-based design of animated installation for immersive spaces makes reference to *The ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites* (2008) and to *The London Charter: For The Computer-Based visualisation of Cultural Heritage* (2009). We integrated to the materials used by BTP for the Western Xia history (Tang 2006, 2013, 2015) both the results of academic research referred here in *Chapter 1* (Western Xia and the Tangut people) and 2D digital reproductions of the cultural relics held in the above mentioned Museum of the Western Xia Imperial Tombs.

Russell Staiff notes that each culture has its own tradition of symbols, which are repeatedly used and magnified by today's media world and cultural industry in general. He calls this phenomenon “heritage iconography” (Staiff 2014, 84). The cultural heritage of Western Xia is not an exception. Shi Jinbo, a leading Chinese scholar of Western Xia, highlights how today's collective common understanding of the Western Xia dynasty is mainly based on the martial-arts novel *Demi-Gods and Semi-Devils* (天龍八部 / tiān lóng bā bù) published in the 1960s by Jin Yong, and on the films, television series, and video games that were produced and broadcast in the 1980s and 1990s (Qian 2015).

In 2015, the Beijing Top Production Co. Ltd. (BTP) hypothetically reconstructed the 3D digital version of the capital Xing Zhou/Xingqing Fu as it was in the golden age of Western Xia dynasty. BTP used a combination of scholarly books about the Northern Song dynasty (Shen Kuo 1956) and the Yuan dynasty (Tuo 1990a; Tuo 1990b), *The history of Shuofangdao* (朔方道志 / shuò fāng dào

zhì, see Ma 1991), and archaeological evidence held in the Museum of the Western Xia Imperial Tombs (Shen Kuo 1956; Shi 1986).

The BTP reconstruction shows the overall planning of the capital city of the Western Xia dynasty assuming that it imitated the urban structure of Bian Liang (today's Kaifeng, Henan province), but the imperial palaces, instead of being placed on the central axis, are built in the north-western urban area. The use of these sources presume the city was built according to Song city models. However, it is still a subject of debate among scholars, in the lack of convincing proof, either written or archaeological (Wang 2002, 151-155). Moreover we know that the city was destroyed by the Mongol army then rebuilt several times during the following dynasties. There is no clear evidence of where exactly the former palaces were located within the city (Wang 2002, 155-156).

Diane Zhang-Goldberg puts forward that “A triple symbolism presided over the design of the tombs of the imperial cemetery of Western Xia: Buddhist, imperial, and traditional. On the surface, the Western Xia sovereigns accumulated manifestations of their Buddhist piety. First they chose to build their graves at the foot of the Helan Mountains, which they most likely considered a sacred place almost equal to Mount Wutai. Then they erected a monumental *stūpa* in the enclosure of each imperial tomb. Finally, roof ornaments and other architectural decorative elements (in particular zoomorphic and lotus motifs) refer to the Buddhist religion and to the creatures that inhabit the Pure Land. On the other hand, the interior architecture of the tomb does not offer conspicuous religious signs, at least in the current state of the excavations. Its symbolic content seems entirely turned towards imperial legitimation, embodied by the choice of burial rather than that of cremation. As for the furniture found in the attached tombs, it seems to have the function of evoking the pastoral origin or the agricultural occupations of the Tanguts: statues of horses, bulls, iron and stone dog sculptures, as well as many bones of animals” (2012, 58 and 60, in French, translated by the authors).

Archaeological relics demonstrate that the roofs of the Imperial Tombs were mostly covered by green glazed tiles and decorated at the edges

¹⁰ Principal Investigator, Andrea Nanetti, Associate Professor and Associate Chair (Research) at ADM-NTU. Collaborators at

ADM NTU: Professor and Academy Award-winning Filmmaker Ben A. Shedd, and PhD Candidate Luo Shen-Shen.

with “hornless-dragon mouth” (螭吻 / chī wǎn), the head of *Chi*, dragon fish, *Makara*-like sea dragon/monster, lion, and “exquisite sounding bird” (迦陵频伽 / jiā líng pín qiè)¹¹.

For the concept design, we did not work on historical records for the music of Western Xia. According to some scholars, the Tangut had been greatly influenced by the music of the Tang dynasty after moving to the middle and upper reaches of the Yellow River (Sui 2006, 36). We

know that Yuanhao reformed Western Xia's music after becoming supreme sovereign (Li & Bai, 2003, p. 601). However, after Renzong succeeded the throne, some scholars believe that Western Xia music was influenced by the Northern Song in the central plains region because of Confucianism (Shi, 1986, p. 142). After the demise of Western Xia, the Mongols adopted the rhythm of Western Xia music as its court music (Shi, 1986, p. 143).

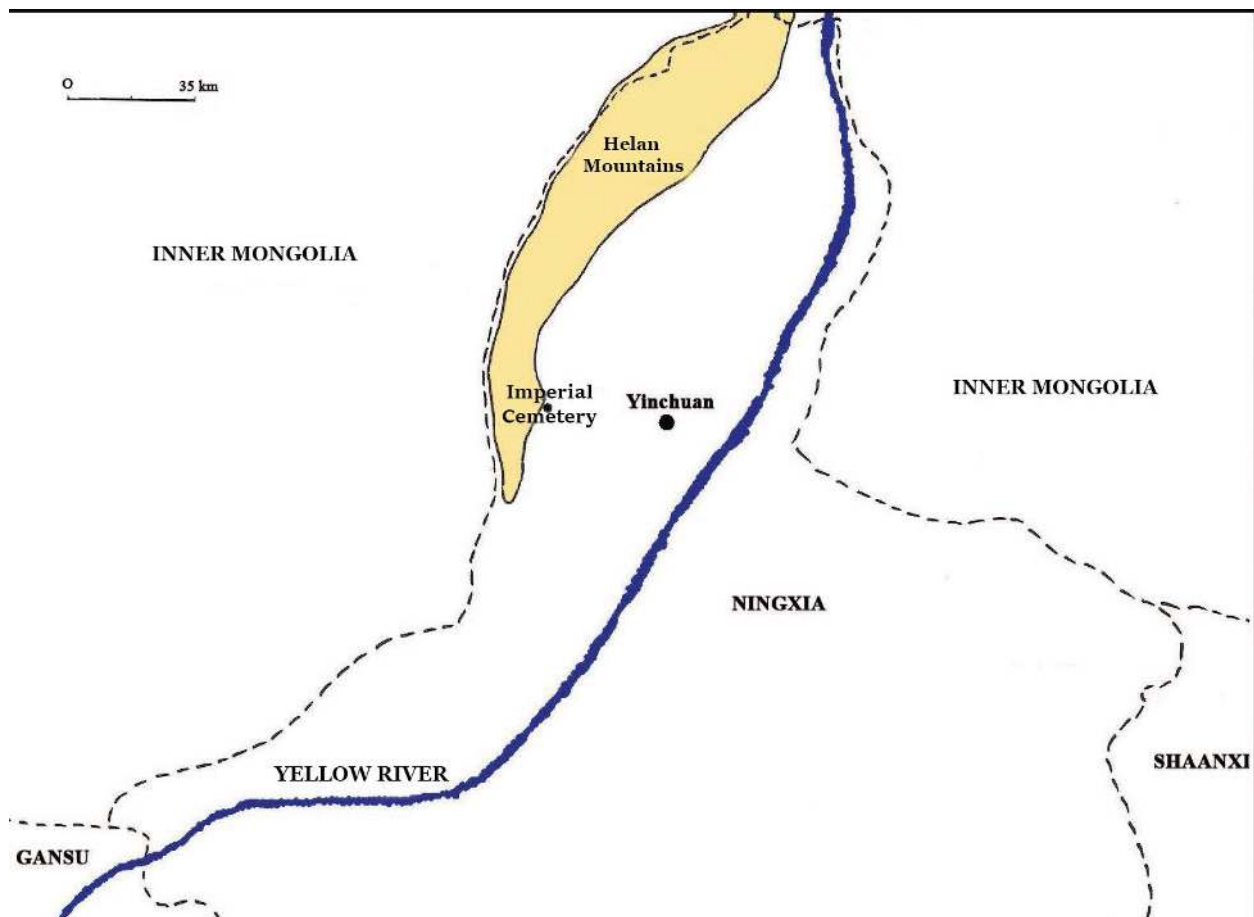


Fig. 6: Yinchuan and its region. Map by Zhang-Goldberg (2012, 48).
Translated from French into English by Luo Shen-Shen.

¹¹ See the excavation reports by the Institute of Cultural Relics and Archaeology of the Ningxia Hui Autonomous Region (Xu & Du 1995; Zhu, C., Sun, C., & Wang, H. 2002; and “Western Xia No. 3” 2007) and the book edited by Tang Xiaofang for the

Xixia Museum (Tang 2003), which provides an overview on the Western Xia art (painting, sculpture, architecture, arts and crafts, calligraphy and seal carving) based on the archaeological findings collected in China.

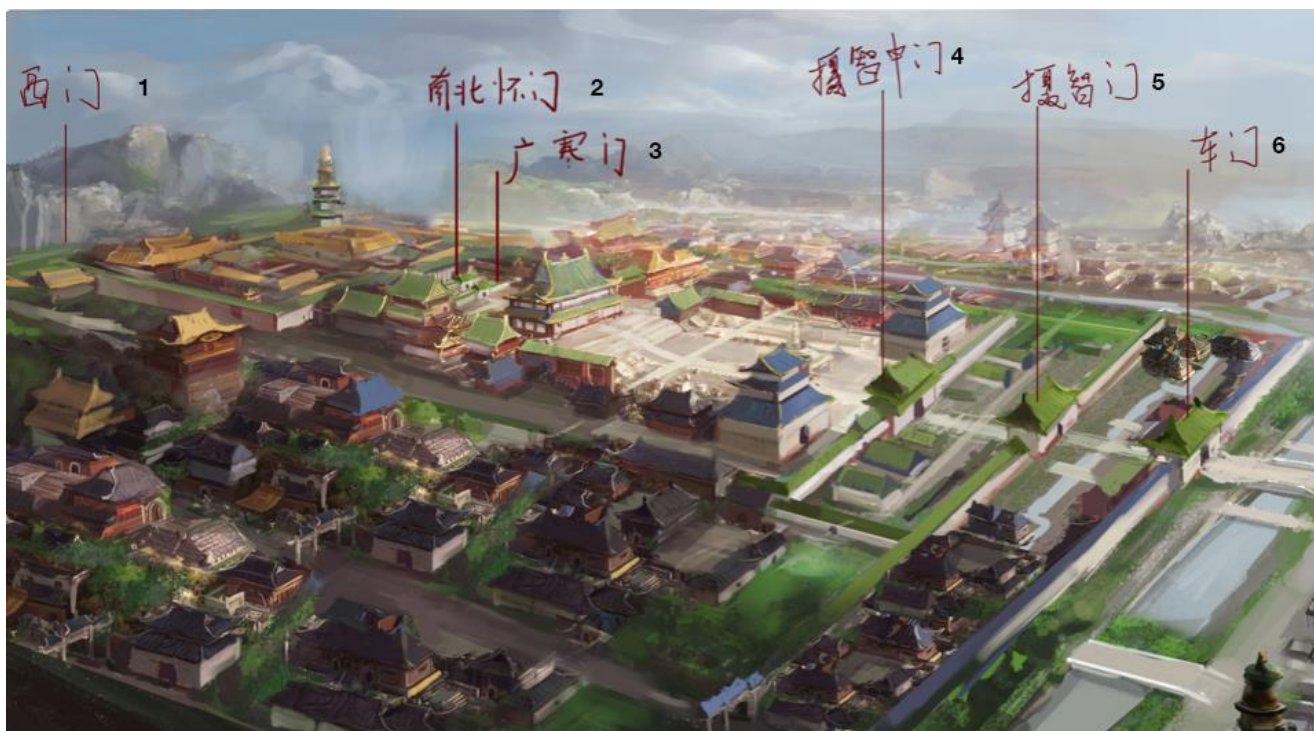


Fig. 7: Hypothetical urban reconstruction of the Western Xia palace in the capital city Xing Zhou/Xingqing Fu made by Beijing Top Production Co. Ltd. in 2014 [1. West Gate, 2. Huai Gate, 3. Guanghan Gate, 4. Shezhi Center Gate, 5. Shezhi Gate, 6. Che Gate]. Among scholars there is discussion about the architecture of the palace (Wang 2002, 155-156).

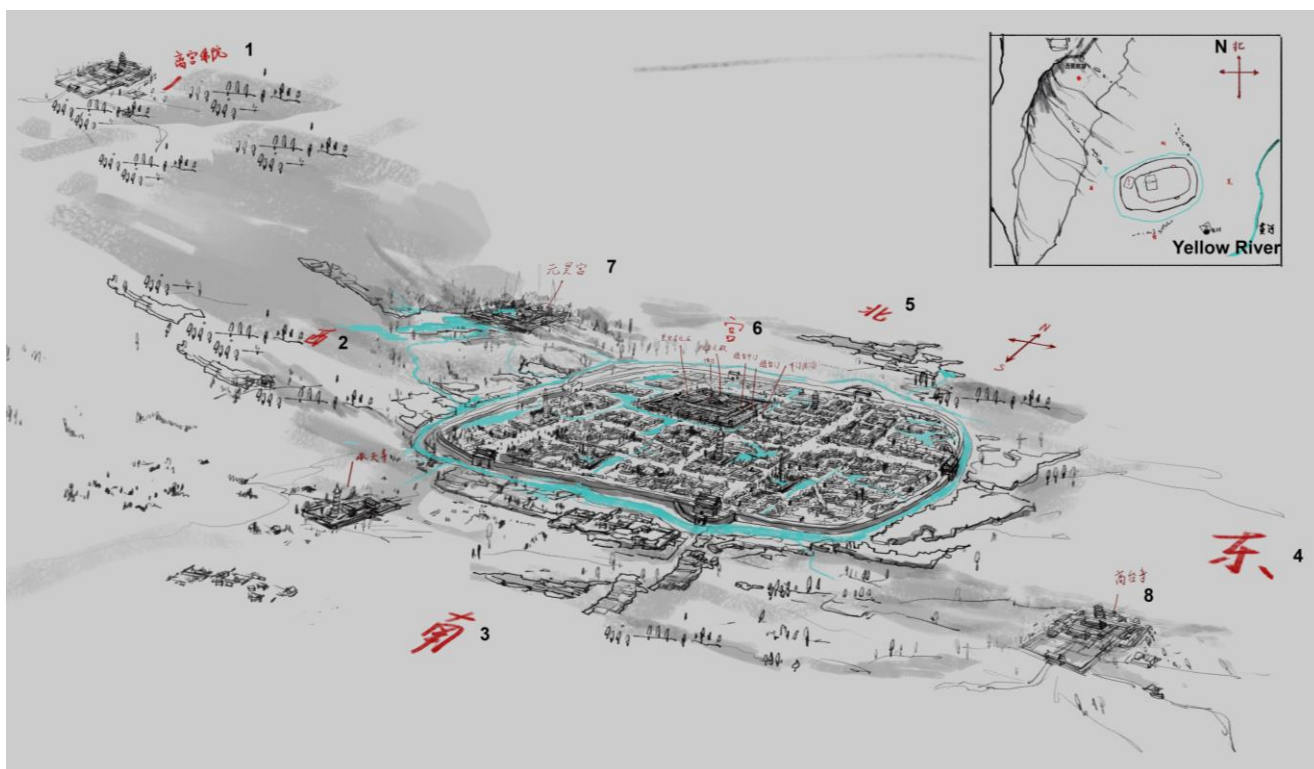


Fig. 8: Hypothetical topographic reconstruction of the Western Xia capital city Xing Zhou/Xingqing Fu made by Beijing Top Production Co. Ltd. in 2014 [1. Li Gong Buddhist Temple, 2. West, 3. South, 4. East, 5. North, 6. Royal/Imperial Palace, 7. Residential Palace of the Western Xia sovereigns, 8. Gao Tai Temple]. Among scholars there is discussion about the exact location and the orientation of the ancient western Xia capital (Wang 2002, 151-155).



Fig. 9: Li Yuanhao (b. 1003, reign 1032-1048), the son of Li Deming, at the time of the foundation of the new capital city Xing Zhou (renamed Xingqing Fu by Yuanhao in 1038). After having started the construction of the mausolea for his grandfather (Li Jiqian, 963-1004) and father (Li Deming), followed the tradition of the Tang and other Chinese dynasties to name Taizu and Taizong their founder and son respectively (Shatzman Steinhart 1992, 369 and 370-371).
Designed by Luo Shen-Shen and drawn by Luo Fujian in 2016.

4. *The Transformation of an Underground Tunnel into an Immersive Time Tunnel (Overall Layout and Visitors' Experience)*

Between the new museum and the archaeological site, there is an abandoned north-south underground tunnel (350 x 19 x 9 meters). The Yinchuan municipal government decided to reuse this underground tunnel to let the visitors enter the archaeological site from underground without a new road/path and thus with no impact on the above ground landscape and site.

Our concept design proposes to use this underground tunnel as a "time tunnel" and provide the visitors with an immersive experience during their physical transfer from the Museum of the Western Xia Imperial Tombs to the archaeological site of the Western Xia Imperial Tombs.

The entrance and exit of this 350-meter-long corridor are not included in the concept design project, which focuses only on the 265.6 meters of the actual underground part of the tunnel. In this immersive space, both the history of the Tangut people (before the 7th century CE) and the Western Xia dynasty (1038-1227) are presented to the visitor in six chronologically consequential sections.

- 1) Migration of the Tanguts from the Qinghai-Tibet plateau to the southern banks of the Yellow River (before the 7th century CE) and the crossing of the Yellow River (post-763 CE);
- 2) Foundation of the capital city as Xing Zhou (1020, by Li Deming) and then renamed Xingqing Fu (1038, by Yuanhao);
- 3) Battle of Haoshuichuan (1041);
- 4) The Origins of the Tangut script (1032-1048);
- 5) Flourishing of Confucianism and Buddhism during the reign of Renxiao (1139-1193);
- 6) Destruction of Western Xia (1227).

The visitors, moving through the animated installation, will have an immersive experience of going back in time, to ancient Western Xia, and be ready to fully appreciate the heritage wealth and the natural beauty of today's archaeological site of the Western Xia Imperial Tombs.



Fig. 10: Overall layout of the dark ride designed by Luo Shen-Shen in 2016 for the underground tunnel linking the museum to the archaeological site.

5. Transportation of the Visitors Inside the Tunnel: A Dark Ride on a Traditional Carriage

The high number of visitors recorded during the 2014 tourist peak season, left no doubt that, for safety reasons, we need to control and restrict the visitors' movements and create a "dark ride", which has many turns for dramatic and technical reasons. This kind of visiting mode, frequently used in theme parks, has major advantages in visitors' safety for the management and full control of view angles and view times for the designer.¹²

To design the vehicle, we have referred to the traditional horse-drawn carriages of the Western Xia dynasty.

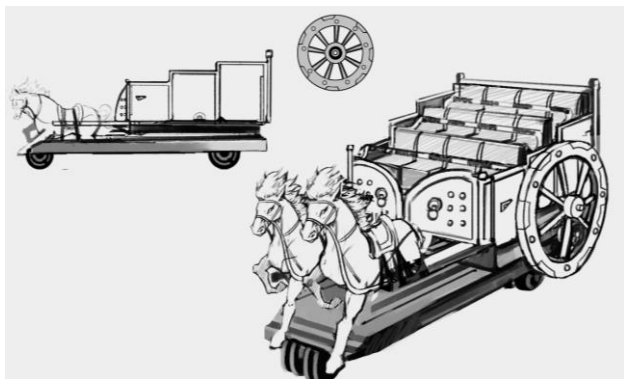


Fig. 11: The concept design of Western Xia horse-drawn carriage. Drawn by Luo Shen-Shen in 2016.

However, for the final design we have taken into consideration the comfort of the visitors as well, especially to ensure them a better view.

The vehicle adopts a tri-axial moving technology (pitch, roll, heave, slip and surge movement, Hettema et al. 1998). Its length and width (within 3.5 and 3 meters) derives from the width of the tunnel (9 meters) and the fact that the straight-line distance between the vehicle and the surroundings cannot be less than one meter, according to the Chinese National Safety Standards. Each vehicle can take 12 visitors at most. We have planned 20 vehicles in total to circulate and pick up the visitors during the peak tourist season.

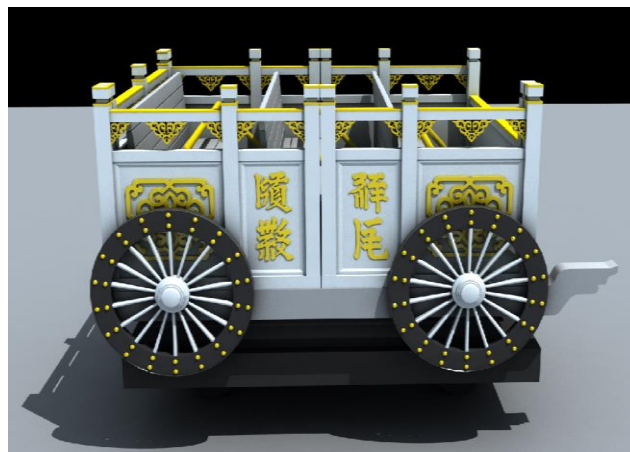


Fig. 12: Vehicle for the visitors' dark ride inside the underground tunnel. Designed and drawn by Luo Shen-Shen in 2016.

6. Designing Scenes for an Immersive Space from the Visitors' Perspective

Today "immersive space" covers many areas: virtual reality, computer games and digital film, large projections and surround screens, and physical spaces (Sherman and Craig 2003, 4-37). All works agree upon a feature of immersive spaces: artificiality. The vast majority of them are digital even if sometimes they include physical objects (sculptures). The stage, the animated installations, the characters, and the lighting of this project are all designed from this perspective.

In practices, for the Western Xia project, when we finished drawing the first sketches, we imagined ourselves travelling in the tunnel as visitors. As the vehicle shakes and sways, the surrounding images appear and disappear. We had to consider whether the turns were too large, which could have made the visitors feel uneasy or alienated from the images. We had to think about whether the colour of the light was correct, and whether the visitors would experience these specific problems in the immersive space that we were creating.

Not only to save time and funds, but also to create a more effective concept design, we used pre-visualization methods to better grasp the atmosphere of the scenes instead of providing only a rough sketch to be adjusted later by 3D scene designers.

¹² "The earliest dark rides were rather low-tech attractions that park owners often designed and built in-house. According to the industry trade journal *Amusement Business*, the design and implementation methodologies for dark rides changed dramatically with the opening of Disneyland in Anaheim, California in 1955, and the premiere of Disney's Haunted

Mansion [in 1989]. With its distinctive external and internal decor, elaborate special effects, and dramatic staging elements, the attraction elevated the innovations and technologic enhancements expected by dark ride enthusiasts" (Dominey et al. 2004, 13).

The optimal advantage of pre-visualization can facilitate the designer to free the visitor's imagination in the immersive experience. In drawing the design sketches for each scene, the designer may incorporate various factors, including the visitor's experience model, the location of the visitor, the perspective of the visitor's experience, film content, the content of the scenes, the immersive screens, and lighting effects to recreate the historical events.

Each visit time is set to 20 minutes in order to give to the visitors the time to absorb the information and enjoy the experience as well. According to the preliminary calculation, the maximum time for each scene is 180 seconds, and the minimum time is 30 seconds.

7. Concept Design of the Animated Installations for the Guide/Narrator and the Six Themes/Acts of the Dark Ride

7.1 The Guide/Narrator



Fig. 13: The *shibi*-narrator welcoming the visitors into the dark ride. Designed by Luo Shen-Shen Luo and drawn by Hou Sanli in 2016.

The guide/narrator, who welcomes the visitors, is a *shibi* (释比 / shì bǐ), the shaman who performs ritual sacrifices in the Qiang religion and can epitomize the Qiang culture as a whole. According to Han Xiaomang (1988, 58), the Tangut called the shaman *si* (厮 / sī; Li 2005, 595).

According to scholarly research, the Tanguts advocated shamans for their abundant social experience and considerable medical knowledge (Zhang 2009, 76-102; Shi 1995, 18). Thus the *shibi* as a narrator immediately immerse the visitors into the historical landscape of the Tanguts. To identify and draw the *shibi*-narrator in Western Xia, we used secondary literature referring to the Song dynasty and the Liao cultures (Shatzman Steinhardt 1997; Tang 2013; Zhang 2009; Deng, 2013). However, the *shibi* of the Western Xia might have been very different from the *shibi* described in those sources. This animation of the Western Xia *shibi* is an imagined version.

7.2. Section 1. Migration of the Tanguts from the Qinghai-Tibet Plateau to the Southern Banks of the Yellow River (before 7th Century CE), and the Crossing of the Yellow River (post-763 CE)

The first section that the visitors will see from the carriage on their left will be the *shibi*-narrator under a spotlight in a whole green stage. He will tell the story of the origins of the Tangut people. The grassland and mountains of the Loess plateau are staged with props (e.g., sculptures of cattle and flock) below a 10-meter-long screen displaying the Tanguts and the other peoples that shared with them the north of the Qinghai-Tibet plateau (Tuyuhun and Tuoba) and together they made several incursions into Chinese territory across the Yellow River.

In the second half of this first section, on the right side, the whole stage is golden yellow and introduces to the crossing of the Yellow River. Models of boats and sheepskin raft, possibly used to cross the Yellow River, are placed between the vehicle and the screen.



Fig. 14: Section 1. Layout designed by Luo Shen-Shen, drawn by Li Chong in 2016.



Fig. 15: Left side of Section 1. The Tangut people in the Qinghai-Tibet plateau before the migration to the southern banks of the Yellow River (before 7th century CE). Designed by Luo Shen-Shen, drawn by Li Chong in 2016.



Fig. 16: Right side of Section 1. The Tangut people in the north of the Qinghai-Tibet plateau (before 7th century CE). Designed by Luo Shen-Shen and drawn by Li Chong in 2016.

7.3. Section 2. Foundation of the Capital City as Xing Zhou (1020, by Li Deming) and then Renamed Xingqing Fu (1038, by Yuanhao)

A gate will be opened with isolated sound effects to welcome the visitors in the second theme, which is divided into three parts.

- 1) After the gate, on the right side, sculptures and a 10-meter screen will display the

prosperous life inside the capital city of Western Xia.

- 2) Afterwards, with a suddenly rising temperature, the vehicle brings the visitors into the weapons' workshop of Western Xia (Shi 1986, 162-165).
- 3) At the end, the visitors will see how Yuanhao proclaimed himself emperor of Western Xia on a holographic screen.

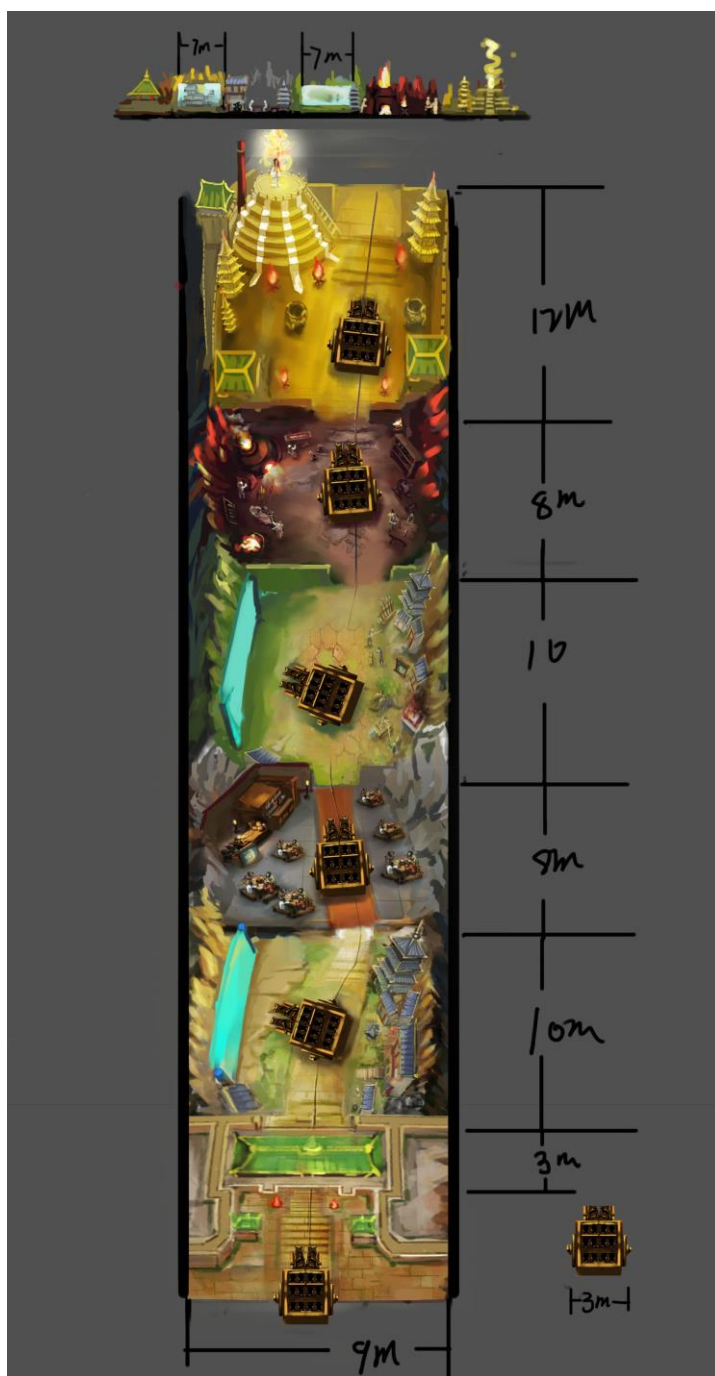


Fig. 17: Section 2. Layout designed by Luo Shen-Shen in 2016.



Fig. 18: Section 2. Entering Xingqing Fu, the capital city of Western Xia. Designed by Luo Shen-Shen and drawn by Luo Fujian in 2016.

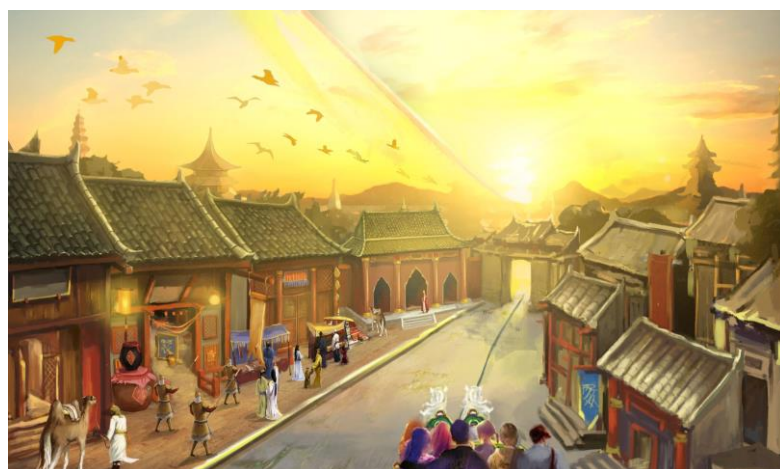


Fig. 19: Section 2. Inside Xingqing Fu, the capital city of Western Xia. Designed by Luo Shen-Shen and drawn by Luo Fujian in 2016.

7.4. Section 3. The Battle of Haoshuichuan (1041)

The third section presents the Battle of Haoshuichuan (1041). The visitors will enter a 7-meter-diameter dome, see the Tiejaozi cavalry¹³ (铁鹞子 / tiě yào zi) crossing toward them from the rear and go to the battlefield. The vehicle will rise and face downward making the visitors feel like overlooking the fierce battle from a hill.

7.5. Section 4: The Origins of Tangut Script During the Reign of Yuanhao (1032-1048)

In the fourth section, the visitors experience a Pepper's Ghost vision¹⁴, in which the Western Xia

characters introduced at the time of sovereign Yuanhao float in a starry night. The visitors on the right side can use their fingers on a small touch screen to command the transparent Western Xia characters moving on the Pepper's Ghost screen.

7.6. Section 5: Flourishing of Confucianism and Buddhism During the Reign of Renxiao (1139-1193)

In this section, two vehicles are gathered together, and the visitors can experience both Buddhism and Confucianism translated into Tangut on gigantic screens.



Fig. 20: Section 3. Layout designed by Luo Shen-Shen in 2016.

¹³ Tiejaozi is the cavalry established by Yuanhao in Song and Liao dynasty. As the cataphracts, the cavaliers are held together with the armours on the horses and equipped with thick armours, and they often contribute to breaking through infantry squares because of the extremely strong impact. The cavaliers will not fall down from their horses even when they have been killed. Therefore the dead cavaliers can still hurt

the enemies with their weapons fixed on the armours when the horses are running (Tuo 1990a, 220).

¹⁴ In 1862, Professor John Pepper invented the Pepper's Ghost system of theatrical illusion. It is used in theatres, amusement parks, museums, etc. ("University of Westminster" n.d.) and creates the illusion of transparent characters within a real space.



Fig. 21: Section 4. Layout designed by Luo Shen-Shen in 2016.



Fig. 22: Section 5. Layout designed by Luo Shen-Shen in 2016.



Fig. 23: Section 3. The battle of Haoshuichuan (1041). Designed by Luo Shen-Shen and drawn by Wang Yingluo in 2016.



Fig. 24: Section 4. The origins of the Tangut script during the reign of the Western Xia sovereign Yuanhao (1032-1048). Designed by Luo Shen-Shen and drawn by Wang Yingluo in 2016.

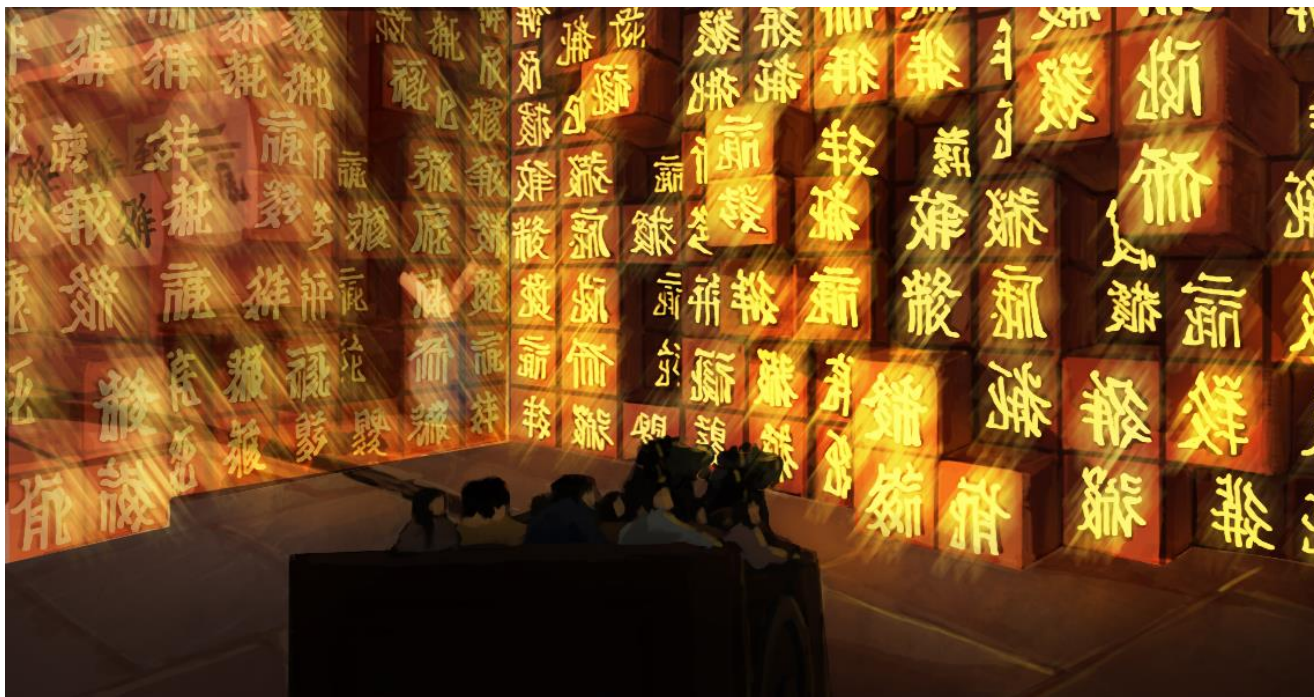


Fig. 25: Section 4 and 5. The introduction of Confucianism and Buddhism during the reign of the Western Xia sovereign Renxiao (1139-1193). Designed by Luo Shen-Shen Luo and drawn by Wang Yingluo in 2016. The characters are reversed because they want to illustrate the printed blocks that were hypothetically used by the Tangut (for this hypothesis see Shi 1986).

7.7. Section 6: Destruction of Western Xia (1227)

For the last section, the whole stage is designed in bright red. The vehicle will travel among eight 10-meter-long gigantic screens. The defence forces of Western Xia will be displayed on the left screens and the sieging Mongol troops commanded by Genghis Khan on the right screens. This stereoscopic-like stage will make the visitors feel like being in the middle of the battle field.

Movable sculptures of sieging machines will be put on stage to enhance the experience. The visitors should feel like running along the huge walls of Xingqing Fu. The vehicle will shake and surrounding sound complete the immersive feeling. As the battle ends, near the exit the *shibi*-narrator, in a blue background, will greet the visitors and quietly welcome them to the Western Xia Imperial Tombs archaeological site.

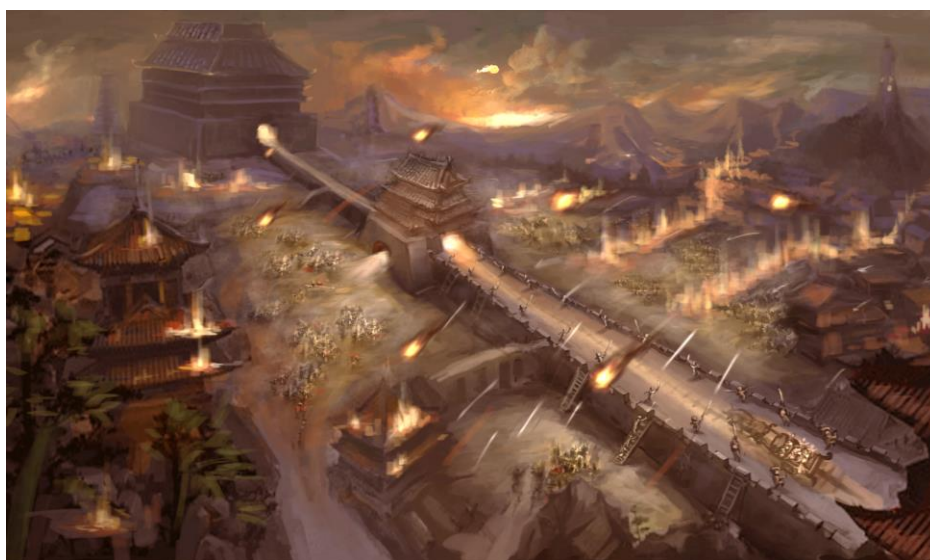


Fig. 26: Section 6. The destruction of Western Xia (1227). Designed by Luo Shen-Shen and drawn by Luo Fujian in 2016.

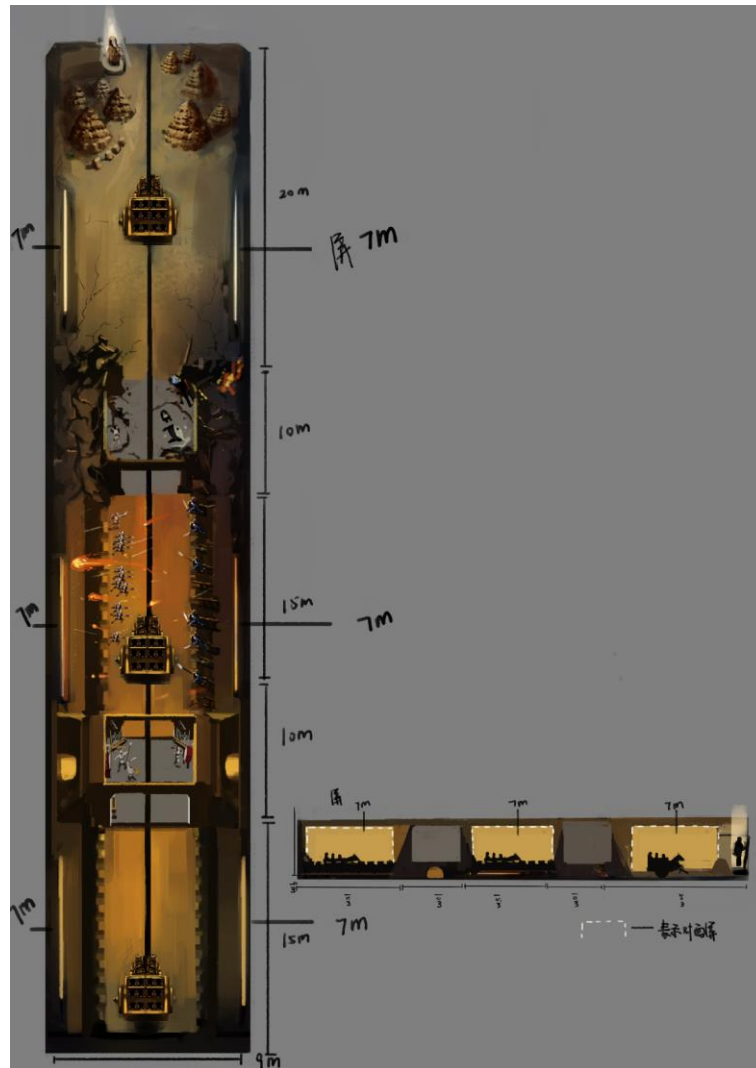


Fig. 27: Section 6. Layout designed by Luo Shen-Shen in 2016.



Fig. 28: End of the Dark Ride. The *shibi*-narrator introducing the visitors to the Western Xia Imperial Tombs, at the end of the dark ride. Designed by Luo Shen-Shen and drawn by Li Chong and Luo Fujian in 2016.

8. Clay Model of the Underground Tunnel

After having accomplished the concept design of all sections, we made a clay and resin model to support the realisation of the architectural space. The model (scale 1:50) is 5.31-meter long.

The model is supplemented by animations made with Autodesk 3-D Max (the footage for the ride is 6 minutes and 30 seconds). In this way the final presentation of the concept design combines 2-D animation and 3-D animated modelling.



Fig. 29: Luo Shen-Shen and the clay model of the underground tunnel that he made in 2015. Photo by Mr. Yan Jiang (2016).

9. Conclusions

The realisation of the concept design for the underground tunnel that links the museum to the heritage site of the Western Xia Imperial Tombs took four months for the NTU-ADM research team. The display of the animated installations uses gigantic and dome screens, and holographic tools, together with stage decorations and live shows to create for the visitors an immersive experience through dynamic narrations.

The aim is to enhance the visitors' experience of the knowledge and the values embedded in the Tanguts' and Western Xia's cultural heritage as it is still present in both the museum and the archaeological site of the Western Xia Imperial Tombs. From this perspective, the concept design took as much advantage as possible of the scholarly works published so far in Chinese, English, Russian, and French.

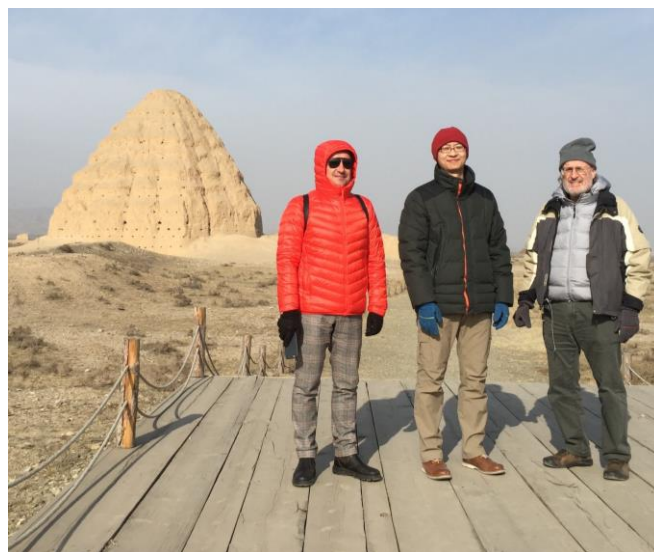


Fig. 30: The NTU-ADM research team (from left: Andrea Nanetti, Luo Shen-Shen, Ben A. Shedd) in the Western Xia Imperial Tombs heritage site (15 January 2016). Photo by Ms. Ma Ming.



Fig. 31: Li Yuanhao (sovereign of Western Xia) looking his capital city Xingqing. Designed by Luo Shen-Shen and drawing by Luo Fujian in 2016. The reconstruction of the city is based on materials provided by the Beijing Top Production Co., Ltd. (see here above Fig. 7 and Fig. 8). The painted figure of Yuanhao (clothes and hairstyle) is based on the documentary film *Mysterious Tangut* directed by Jin Tiemu for the Beijing Top Production Co., Ltd. (2014, based on Li 2005, 583; Shi 2007, II 679-681).

Acknowledgments

This research project on “Animated installations and other creative solutions to increase cultural-heritage-driven immersive experiences in the underground time corridor of Xixia/Western Xia Tomb Museum (Yinchuan, Ningxia Hui Autonomous Region, PRC)” was made possible by a collaboration between the School of Art, Design and Media of the Nanyang Technological University Singapore (ADM-NTU) and the Beijing Top Production Co., Ltd. (BTP) that co-funded it (NTU External Research Grant M4061789).

The research was carried out between November 2015 and February 2016 by Andrea Nanetti (Principal Investigator), Ben A. Shedd (Co-Principal Investigator), and Shen-Shen Luo (Collaborator) at ADM-NTU, and by Luo Fujian, Li Chong, Hou Sanli, Wang Yingluo and Jiang Yan at BTP. Special thanks goes to the ADM-NTU Research Office, namely to Associate Professor Michael Walsh, Associate Chair (Research), and Mrs Lew Huey Shan, Manager, and to the CEO of BTP, Mr. Jin Tiemu, and his senior staff, Mr. Nan Xiayang, Mr. Ji Guorui, and Ms. Ma Ming.

We are particularly grateful to the Yinchuan Government (Ningxia Hui Autonomous Region, PRC) for giving us free access to the Museum and the Archaeological Site of the Western Xia Imperial Tombs, namely to Mr. Zhai Shixiao, Director of the Museum.

The authors are very thankful to Dr. Alexey Frolov (Russian Academy of Sciences, Institute of World History) for his precious advices on the bibliography in Russian, and Dr. Mohammad Javad Khajavi (ADM-NTU graduate alumnus, Volda University College, Department of Animation, Faculty of Media and Journalism) for corresponding on Persian bibliography.

The authors would like to thank Diane Zhang-Goldberg, whose attentive reading of the last draft of this paper has allowed to greatly improve the historical section of this article. We also thank Michael Stanley-Baker for his valuable comments on the reading of ancient Chinese texts. Last, but not least we thank the anonymous peer-review readers of this article for their invaluable comments and suggestions.

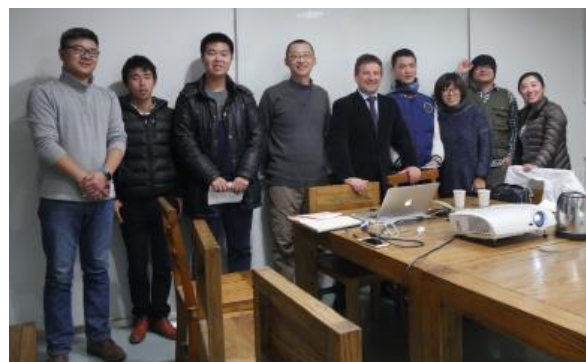


Fig. 32: Research meeting at Beijing Top Production Co., Ltd. (17 December 2015). From left to right: Mr. Xie Yupeng, Mr. Luo Fujian, Mr. Hou Sanli, Mr. Luo Shen-Shen, Dr. Andrea Nanetti, Mr. Li Chong, Mrs. Ma Ming, Mr. Ji Guorui, Mrs. Jiang Yan. Photo by Mr. Nan Xiayang.



Fig. 33: Research meeting at Beijing Top Production Co., Ltd. (18 December 2015). From left to right: Mr. Ji Guorui, Ms. Ma Ming, Mr. Luo Fujian, Mr. Luo Shen-Shen, Mr. Zhang Yan, Mr. Luo Fujian, Ms. Xie Yupeng, Mr. Li Chong. Photo by Mrs. Jiang Yan.

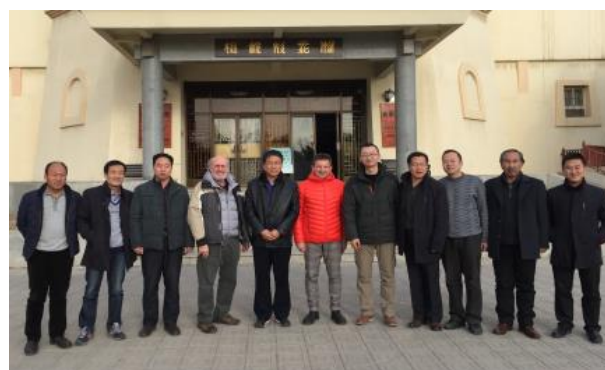


Fig. 34: Research meeting with the staff of the Museum of the Western Xia Imperial Tombs (15 January 2016). Photo by Ms. Ma Ming.

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