Spatial History - "Using GIS and Open Web Resources to Reconstruct Great Tang Records of the Western Regions on the Silk Route"

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Spatial History – "Using GIS and Open Web Resources to Reconstruct Great Tang Records of the Western Regions on the Silk Route"

Zhaohui Jennifer Fu
GIS-RS Center
Digital Collection Center
Libraries
Florida International University
February, 2018
Outline

- Spatial History and Digital Humanities
- Silk Route and author XuanZang
- Great Tang Records of Western Regions in web or digital forms
- Mapping of the Records based upon open sources
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Digital Humanities

- **Technology Infrastructure**
  - Text-mining, big data, data visualization
  - Web publishing/authoring on open platforms
  - Crowd-sourcing and collective knowledge

- **Spatially-Enabled**
  - Visual story-telling ([Story Maps](#))
  - Mapping through space and time ([Spatial History](#))
Visual Story Telling

London Time Machine

The London Time Machine
Travel back to 1666 with this historic map

On Sunday the 2nd of September 1666, the Great Fire of London began reducing most of the capital to ashes. Among the devastation and the losses were many maps of the city itself.

The Morgan Map of 1662 was the first to show the whole of the City of London after the fire. Produced by William Morgan and his dedicated team of Surveyors and Cartographers it took 6 years to produce, and displayed a brighter perspective on city life for a population still mourning their loved ones, possessions, and homes.

But how much of this symbolised vision of a hoped-for ideal city remains today? What now lies on the lush green fields to the south of the river Thames? And how have the river’s banks been eaten into by the insatiable appetite of urban development? Move the spyglass to find out, and
Mapping U.S. Post Offices in the Nineteenth-Century West
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Caravane on the Silk Route

Source: Cave Number Mogao 323, the North Wall of Main Chamber
Buddhist Pilgrimage to India – XuanZang

9th century mural painting of the Buddhist monk Xuanzang travelling with a tiger.

Mogao Caves, Dunhuang, Gansu Province.

Source: Professor Li Xiguang
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Great Tang Records of Western Regions

唐 釋玄奘譯

三國

大唐西域記卷二

卷四

唐釋玄奘譯

蓋定四庫全書

唐大開元年

那僕羅昌國

勝軍王

揚州長史

發兵西征

胡僧玄奘

西遊記

自大唐西遊記

愛維

道

漢譯譚

朵等像

音宜云印度印度之人隨地稱國殊方異俗暹途

言所美謂之印度印度者唐言月月有多名

致因而譬月良以其上聖賢繼軌軌凡御物如

為清貴從其雅稱傳以成俗無云經界之別總

門國馬若其封壇之城可得而言五印度之境

餘里三垂大海北背雪山北廣南狭形如半月

運道。
Outline

- Spatial History and Digital Humanities
- Silk Route and author XuanZang
- Great Tang Records of Western Regions in web or digital forms
- Mapping of the Records based upon open sources
Mapping of Records of Western Regions

- **Goals**
  - 1) validate the unknown or unidentified ancient places recorded by XuanZang;
  - 2) A digital story map of Records of Western Regions

- **Completed work**
  - Digitizing routes
  - Identify coordinates of places
  - Geo-database and visualization on ArcGIS online

- **Resources**
  - Wiki and Baidu entries of places and cities with reference to XuanZang;
  - Getty’s Geographic Names thesaurus
XuanZang Routes Published on Google Maps

https://www.google.com/maps/d/viewer?mid=1aA0N5Nq24148934%2C87.91869149999991&z=4
Scanned Maps of XuanZang Routes
Digitizing and rectifying Xuanzang routes (base maps)

ESRI base maps data sources: ESRI, Delorme, NAVTEQ, TomTom, Intermap, increment P Corp, GEBCO, USGS, FAQ, NPS, NRCAN, GeoBase, Kadaster NL, Ordnance Survey, ESRI Japan, METI, and the GIS User Community.

ESRI Topographic maps: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, INCREMENT P Corp.

ESRI World Imagery: Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.
Digitizing and Rectifying Xuanzang routes

Credits: Routes are digitized by Sheyla Aguilar De Santana, FIU GIS Center
<table>
<thead>
<tr>
<th>Attributes</th>
<th>Attributes</th>
<th>Properties</th>
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<tbody>
<tr>
<td>Place Name</td>
<td># of temples</td>
<td>Sangharama; Buddhist Temples</td>
</tr>
<tr>
<td>Place Name</td>
<td># of believers</td>
<td>Buddhists dwellers in the temples</td>
</tr>
<tr>
<td></td>
<td>Religious notes</td>
<td>Branches of Buddhism; and other religious practices</td>
</tr>
<tr>
<td>Present location</td>
<td>Significant sites</td>
<td>Temples; Stupa; holy sites</td>
</tr>
<tr>
<td>X East</td>
<td>Mythology</td>
<td>Stories about the kings; dragons; Buddha, and bodhisattvas; etc</td>
</tr>
<tr>
<td>Y North</td>
<td>Vegetation and Climate</td>
<td>Plants, agricultural products; weather conditions</td>
</tr>
<tr>
<td>Physical</td>
<td>Products; Currency; Custom</td>
<td>Low frequency of recording</td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Creation of an On-Line Map of Western Regions
Creation of an On-Line Map of Western Regions
Remaining challenges

- Multi-lingual, including classical and contemporary Chinese;
- Unknown places – Geographic names changed through time; versions of interpretations; Places not travelled by heard by Xuanzang;
Text-mining and harvesting from existing resources to expand knowledge about the places;

Publish it in open platforms to invite crowd contributions in transcribing, and translating.

Linked Data -- Getty’s Thesaurus of Geographic Names; to verify historical and contemporary names of the places, particularly unknown places

Using GIS methods and Xuanzang’s description of directions, distances of the places, and surrounding geographic features (river, mountains, etc) to model the potential areas;
## Open Web resources

<table>
<thead>
<tr>
<th>Name</th>
<th>Properties</th>
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<tbody>
<tr>
<td>WiKi</td>
<td>Multilingual; Maps, Coordinates;</td>
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</tr>
<tr>
<td>The Getty Thesaurus of Geographic Names</td>
<td>TGN may be linked to GIS, maps, and other geographic resources; Link Data</td>
<td></td>
</tr>
<tr>
<td>Geonet Names Server</td>
<td>Open Street Map; repository of foreign place-name decisions approved by the U.S. Board on Geographic Names</td>
<td></td>
</tr>
<tr>
<td>Chinese Text Project</td>
<td>Chinese contemporary and classical dictionaries, thesauri with English translation of Chinese terms</td>
<td></td>
</tr>
</tbody>
</table>
XuanZang Referenced in Wiki entries of places

It is believed that the monumental Buddha sculptures were carved into the cliffs of Bamiyan between the 3rd to 6th centuries AD, while the cave complex in the east, including the 38 meter Buddha, a stupa was built in the 3rd or 4th centuries AD. The 55 meter Buddha is believed to date from the 5th and 6th centuries AD.

Historic documentation refers to celebrations held every year attracting numerous pilgrims and that offers were made to the monumental statues. They were perhaps the most famous cultural landmarks of the region, and the site was listed by UNESCO as a World Heritage Site along with the surrounding cultural landscape and archaeological remains of the Bamiyan Valley. Their color faded through time.

Chinese Buddhist pilgrim Xuanzang visited the site on 30 April 630 AD, and described Bamiyan in the Da Tang Xiyu Ji as a flourishing Buddhist center "with more than ten monasteries and more than a thousand monks". He also noted that both Buddha figures were "decorated with gold and fine jewels" (Wriggins, 1995). Intriguingly, Xuanzang mentions a third, even larger, reclining statue of the Buddha. A monumental seated Buddha, similar in style to those at Bamiyan, still exists in the Bingling Temple caves in China’s Gansu province.
<table>
<thead>
<tr>
<th>字部首</th>
<th>異體字</th>
<th>讀音</th>
<th>今譯</th>
<th>漢語詞典</th>
<th>繁體字</th>
<th>傳統字</th>
<th>簡體字</th>
<th>筆劃</th>
<th>意思</th>
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<td>窃</td>
<td>qiè</td>
<td>偷，竊</td>
<td>用不正當的手段獲取。</td>
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<td>頁780第08</td>
<td>0023第02</td>
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<td>以人+3</td>
<td>目</td>
<td>yì</td>
<td>`</td>
<td>停止，廢止。</td>
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<td>第94第1</td>
<td>760第1</td>
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<td>yí</td>
<td>ceremony, rites gifts; admire</td>
<td>相吸的兩船。</td>
<td>卷1頁 0228第02</td>
<td>第118第21</td>
<td>2760第3</td>
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</table>

Chinese Text Project
Sources and Contributors:

Вактрия…………. [VP]
……………….. National Register of Historic Places online (2000-)

大夏…….. [VP]
………….. National Register of Historic Places online (2000-)

ختتر………… [VP]
………….. National Register of Historic Places online (2000-)

Bactria…….. [VP Preferred]

Bactriana…….. [VP]

Bākhtar…….. [VP]
………….. National Register of Historic Places online (2000-)

Bakhtrish…….. [VP]
………….. National Register of Historic Places online (2000-)

Daxia…….. [VP]
………….. National Register of Historic Places online (2000-)

Ta-hsia…….. [VP]
………….. National Register of Historic Places online (2000-)

Subject: ….. [VP]
Adding to Records of Western Regions

Wiki Entry: Peshawar

Getty’s Linked Data: Peshawar

Peshawar

From Wikipedia, the free encyclopedia

This article is a stub. You can help by expanding it.

Peshawar (Pāhawar, Pāhawar, پیشاور) is the capital of the Peshawar District and the Peshawar Div in the Khyber Pakhtunkhwa region of northwestern Pakistan. Peshawar is the largest city in the province of Khyber Pakhtunkhwa and one of the largest cities in Pakistan. It is situated at the confluence of the Indus and Kabul rivers. The city was an important city of the Afghan Empire. The modern city was founded around the year 1855.

ID: 7002453

Record Type: administrative

Peshāwar (inhabited place)

Coordinates:
Lat: 34° 00' 29" N  degrees minutes 34.0080  decimal degrees
Long: 71° 34' 43" E  degrees minutes 71.5785  decimal degrees

Note: Located 6 km south of the Khyber Pass, which was on the Silk Road; important trade and military center; inhabitants primarily Pathan; economy based on textile, leather, and copperware production; site of Qissa Khwani bazaar, mosque of Mahabat university.
Kien-t’o-lo—Gandhāra.

The kingdom of Gandhāra is about 1000 li from east to west, and about 800 li from north to south. On the east it borders on the river Sin (Sindb). The capital of the country is called Po-lu-sha-pu-lo;\(^{54}\) it is about 40 li

\(^{53}\) The phrase *tsze chu*, which is of frequent occurrence in Buddhist composition, seems to mean “moreover” or “besides this.”

\(^{54}\) The country of Gandhāra is that of the lower Kābul valley, lying along the Kābul river between the Khoaspes (Kunar) and the Indus. It is the country of the Gandarāe of Ptolemy (*Geogr.*, lib. vi. c. i, 7). The capital was Purushapura now Peshāwar. The Gandarīi are mentioned by Hekataiōs (*Fr.* 178, 179) and Herodotos (*lib.* iii. c. 91, *lib.* vii. c.
Kanishka

From Wikipedia, the free encyclopedia

For other uses, see Kanishka (disambiguation).

Kanishka I (Sanskrit: कैश्शिक, Kāśśikā; Bactrian: Κανισ्क; Kaneshki; Middle Chinese: 迦腻色伽 (Ka-ni-sak-ka > New Chinese: Jianisejia)), or Kanishka the Great, was the emperor of the Kushan dynasty in the second century (c. AD 127–150). He is famous for his military, political, and spiritual achievements. A descendant of Kushan empire founder Kujula Kadphises, Kanishka came to rule an empire in Bactria extending from Turfan in the Tarim Basin to Pataliputra on the Gangetic plain. The main capital of his empire was located at Puruṣapura in Gandhara, with another major capital at Kapisa.

His conquests and patronage of Buddhism played an important role in the development of the Silk Road, and the transmission of Mahayana Buddhism from Gandhara across the Karakoram range to China.

Earlier scholars believed that Kanishka ascended the throne in 78 CE, and that this date was used as the beginning of the Saka calendar era. However, this date is now not regarded as the historical date of Kanishka's accession. Kanishka is estimated to have accessed to the throne in AD 127 by Falk (2001).[1]