VisCap: A Tool for Visualization of Chinese Ancient Capitals

CPSC 533C Course Project Update Presentation

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Why?

- Chinese history is long and complex and it deserves to be more carefully studied, not only for foreigners but for Chinese people too!
- High level of centralization, a capital means a lot to the whole country!
- No previous work before!
- We are really interested in this topic!
What?

- Chinese ancient capitals
- A range of about three thousand years (1046 B.C. ~ 1840 A.D.)
What? (Dataset)

- Wikipedia
- Start from 1046 B.C. to 1840 A.D.
- A total of 244 entries
- Pre-processed heavily
  - Lots of missing data, especially before 1 A.D.
  - Lots of uncertain data
  - History is subjective
What? (Attributes)

- Name, time, location, dynasty, ethnic group, scope, relationship
  - Linzi (now Zibo)
  - 386 B.C. ~221 B.C.
  - 36° 48’ N, 118° 03’ E
  - Qi
  - Han
  - Regional
  - Conquered by Qin
What? (Exploration)

- Geographical distribution of capitals at one time point or during a time range
What? (Exploration)

- Accumulative geographical distribution of capitals during a time range

1046 B.C. ~ 1840 A.D.
What? (Exploration)

- Comparison of capital densities between different geographical regions in a time range
- E.x.: during 770 B.C. to 670 B.C., there were 11 capitals located at the Yellow River area; while the number of capitals at the Yangzi River area was 3.
What? (Exploration)

- Comparison of different cities in terms of number of dynasties choosing it as a capital, time range when it was a capital and its distribution pattern
## What? (Exploration)

<table>
<thead>
<tr>
<th>Beijing</th>
<th>Xi’an</th>
</tr>
</thead>
<tbody>
<tr>
<td>770 B.C.~226 B.C.</td>
<td>202 B.C.~200 B.C.</td>
</tr>
<tr>
<td>352 A.D.~357 A.D.</td>
<td>200 B.C.~8 A.D.</td>
</tr>
<tr>
<td>911 A.D.~913 A.D.</td>
<td>8 A.D.~23 A.D.</td>
</tr>
<tr>
<td>1122 A.D.~1123 A.D.</td>
<td>24 A.D.~25 A.D.</td>
</tr>
<tr>
<td>1153 A.D.~1214 A.D.</td>
<td>191 A.D.~195 A.D.</td>
</tr>
<tr>
<td>1276 A.D.~1368 A.D.</td>
<td>313 A.D.~316 A.D.</td>
</tr>
<tr>
<td>1421 A.D.~1424 A.D.</td>
<td>319 A.D.~328 A.D.</td>
</tr>
<tr>
<td>1441 A.D.~1644 A.D.</td>
<td>351 A.D.~394 A.D.</td>
</tr>
<tr>
<td>1644 A.D.~1644 A.D.</td>
<td>386 A.D.~417 A.D.</td>
</tr>
<tr>
<td>1644 A.D.~1840 A.D.</td>
<td>418 A.D.~418 A.D.</td>
</tr>
<tr>
<td>202 B.C.~200 B.C.</td>
<td>535 A.D.~557 A.D.</td>
</tr>
<tr>
<td>200 B.C.~8 A.D.</td>
<td>557 A.D.~581 A.D.</td>
</tr>
<tr>
<td>8 A.D.~23 A.D.</td>
<td>582 A.D.~584 A.D.</td>
</tr>
<tr>
<td>24 A.D.~25 A.D.</td>
<td>585 A.D.~604 A.D.</td>
</tr>
<tr>
<td>191 A.D.~195 A.D.</td>
<td>618 A.D.~684 A.D.</td>
</tr>
<tr>
<td>313 A.D.~316 A.D.</td>
<td>705 A.D.~904 A.D.</td>
</tr>
<tr>
<td>319 A.D.~328 A.D.</td>
<td>1644 A.D.~1644 A.D.</td>
</tr>
<tr>
<td>351 A.D.~394 A.D.</td>
<td>1644 A.D.~1645 A.D.</td>
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<tr>
<td>386 A.D.~417 A.D.</td>
<td></td>
</tr>
<tr>
<td>418 A.D.~418 A.D.</td>
<td></td>
</tr>
</tbody>
</table>
What? (Exploration)

- The trend of a dynasty moving its capitals
  - How to represent the time range?
    - Animation?
    - Static image?
How? (Visual encoding)

- Capital: color (hue), text label
- How many colors?
How? (Visual encoding)
How? (Visual encoding)

- Time (Impact): size
How? (Visual encoding)

- What is the function between time and size?
How? (Visual encoding)

- Location
- Dynasty: text label
How? (Visual encoding)

- Scope: ring

National capital

Regional capital
How? (Visual encoding)

- Ethnical group?
  - Shape?
  - Saturation?
How? (Interface components)
How? (Interaction approaches)

- Time slider and main panel
  - Capital distribution at a time point
  - Capital distribution during a time period
How? (Interaction approaches)

- Obtain text information
How? (Interaction approaches)

- Time slider and 2D histogram panel
  - Select a time range in time slider
  - Show capital distribution against the background depicting all capitals across the whole time range
How? (Interaction approaches)

- Region comparison panel
  - Select different areas in the main panel;
  - Show histogram of number of capitals;
  - *Translate, zoom in or out to see information during a detailed time range*
How? (Interaction approaches)

- Capital comparison panel
  - Select different capitals in the main panel;
  - Compare distributions of time range when the cities are capital;
Other work remains to be done

- How to represent relationship?
Demonstration
Q&A
Thank you!