Visualization Approach to a Korean Genealogy Data

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The Purpose of this Paper

• Simplify and visualize intricate historical materials for supporting the analysis to variegated research subjects

• Methodology development applied to a historical data especially having hierarchy structure from visualization approach

• Find ancestors’ effect on individual’s social achievement from visualization approach
Theoretical Framework

• The succession range of property and office to next generation (Goody 1973)

• Tendency to “descent group mechanism” perspective
  • Intergenerational effects; measuring transmission of social positions within a two-generation (parent-to-offspring)
  • Multigenerational effects; measuring transmission of social positions from multigenerational influences (Mare 2011)
Sociopolitical Background

• In pre-modern Korea

• Characterized by ambiguous status system
  • Guaranteed the possibility of social mobility
  • Clarity between status boundaries acted as an obstacle for social mobility

• Becoming a public office during this period was directly associated with salary and estate.
  • Stipend Land System and Rank Land Law in Goryeo dynasty(918-1392) and Joseon dynasty(1392-1910)
• The elite families’ priority was to enter government service.

• Thus, individuals’ and families’ primary concern in the premodern Korean society is preoccupied with political intentions rather than the maximization of economic capital.
Data

• The oldest genealogy in Korean history
  • The Genealogy of the Andong Gwon-ssi in the Cheonghua era 安東權氏成化譜 (henceforth GAG)

• Including the multilateral kinships such as agnate kinship from blood ties and affinal kinship by marriage relationships
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注：具体信息请参考文档内容。
Genealogy Structure
Derivative challenges

• Derivative challenges from Progenitor-oriented-record structure
  • The possibility of artifacts; structural bias
  • Autocorrelation issue; the edges from a single genealogy are not independent
  • Boundedness, cohesion, size and cohesive relinking, types of relations and relinking, and groups or roles (White et al 1999)

• Trace the impact of patrilineal line or collateral relative like ‘great uncle’ on ego’s social achievement from visualization approach
Priorities to visualizing data

• Measure contribution levels of father, grandfather, great-grandfather on the son with standardized regression coefficients

• Product visualization with radial tree structure based on the contribution levels of each node

• Trace correlations among generations and marriage networks in each family through designated device filtering
• Measure individual’s social status based on his government official

• Categorizing 7 levels in terms of individual’s government official as well as non-officials
  • The first group; royal family
  • The second group; the senior and junior grades of the first to third court ranks
  • The third group; the senior and junior grades of the fourth to sixth court ranks
  • The fourth group; the senior and junior grades of the seventh to ninth court ranks
  • The fifth group; hyangni clerks who served as assistants to local and central government officials.
  • The sixth group; prospective government officials and military personnel were not considered government officials.
  • Lastly, non-officials represented individuals without career
Visualization of Existing Methods

*Normal tree*

*Radial tree*
Beck, etc. 2014

Genea quilt (Bezerianos 2010)
• Limitation of existing methods to a genealogy data
• Distance edge of showing nodal property, information, and influence in a view
  • Not easy to visualize numerous nodes in a view
  • Not easy to put the whole information on each node in a view
  • Not easy to trace impact measurement coefficients of each node in a view
  • Not easy to be intuitively aware of correlations in nodes in a view
Applied visualization methods

• Directions of methodology development applied to a historical data
  • Consider the nature and size of a historical data
  • Consider the dynamics of a historical data as over passes
  • Consider researcher-centered design
OUTCOME 1

• Applied method
  • Radial tree for intuitively showing whole nodes
• Exploration and compress by using a fisheye lens
• Visualization of influence
• Examine the influence of each node with color and circle size
OUTCOME 2

• Applied method
  • Normal tree and Cartesian tree

• Show nodal property, information, and influence in a view

• Node density; influence indicator

• Upper position has stronger influence than lower position

• Father’s and grandfather’s influence on son’s social achievement

• Collateral relative’s (uncle) influence on nephew’s social achievement

Overview of whole data
Father’s influence

bokyagong sect (left) vs chumilgongsect (right)

Uncle’s influence

bokyagong sect (left) vs chumilgongsect (right)

Visualization approach in terms of a family sect
Findings and Implication

• Ancestors’ effect on individual’s achievement from visualization approach
  • Father’s effect was much stronger than grandfather’s one
  • Grandfather’s effect was not so much strong
  • Uncle’s effect was much stronger than we expect
  • In terms of a family sect, ancestors’ effect on individual’s achievement is different
• Strong potential of visualization approach to a history research
• Challenge for influence index in nodes
• The aim of visualization approach is not only to show the nature and structure of data by intuition but also to explore the answers to research questions in a view