

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

Genealogy Structure



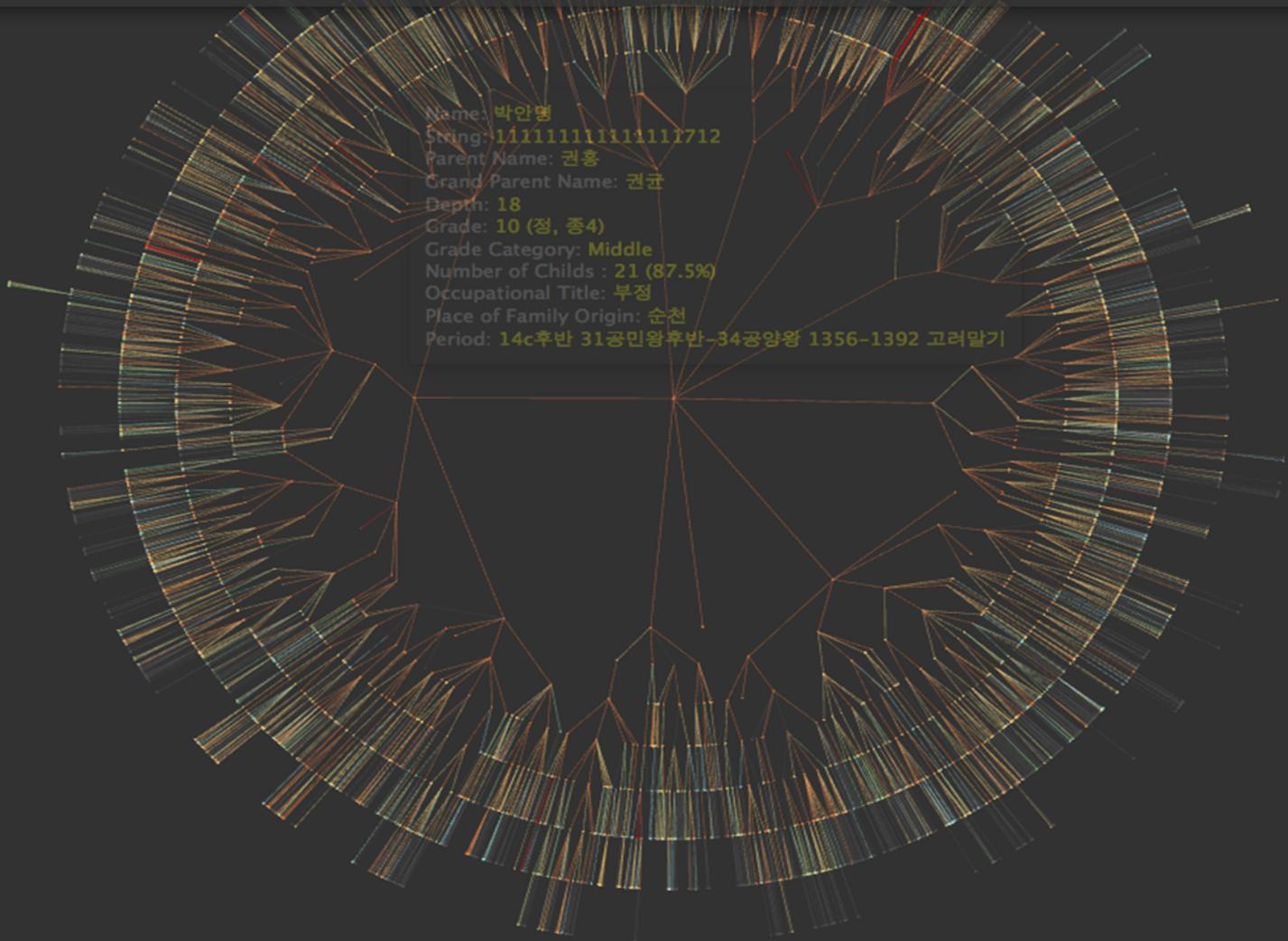
Grade	Count	Percentage
1	3	0.05%
2	6	0.099%
3	4	0.066%
4	8	0.13%
5	0	0%
6	0	0%
7	154	2.5%
8	328	5.4%
9	484	8%
10	322	5.3%
11	475	7.9%
12	492	8.1%
13	234	3.9%
14	48	0.79%
15	113	1.9%
16	0	0%
17	314	5.2%
18	2	0.033%
19	5	0.083%
20	3050	50%

Grade[Grade Number = Count(%)]



Succession Type	Count	Percentage
Parent	2234	37%
GrandParent	328	5.4%
Cousin	1171	19%
Son In Law	2309	38%

Succession[Type = Count(%)]



Name: 박안명
 String: 11111111111111712
 Parent Name: 권홍
 Grand Parent Name: 권균
 Depth: 18
 Grade: 10 (정, 종4)
 Grade Category: Middle
 Number of Childs : 21 (87.5%)
 Occupational Title: 부정
 Place of Family Origin: 순천
 Period: 14c후반 31공민왕후반-34공양왕 1356-1392 고려말기

View Element Option

Root Setting

Default Root Custom Root

Set

Text Information

Set Text Information

Console

```
Name: 박안명
String: 11111111111111712
Depth: 18
Grade: 10
Line: 1
Parent: 권홍 Grade: 8
Grand Parent: 권균 Grade: 8
```

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

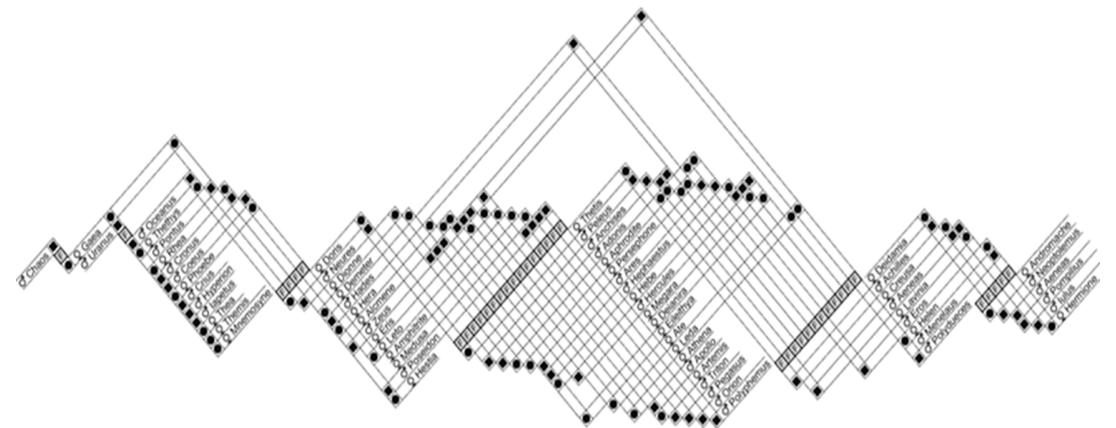
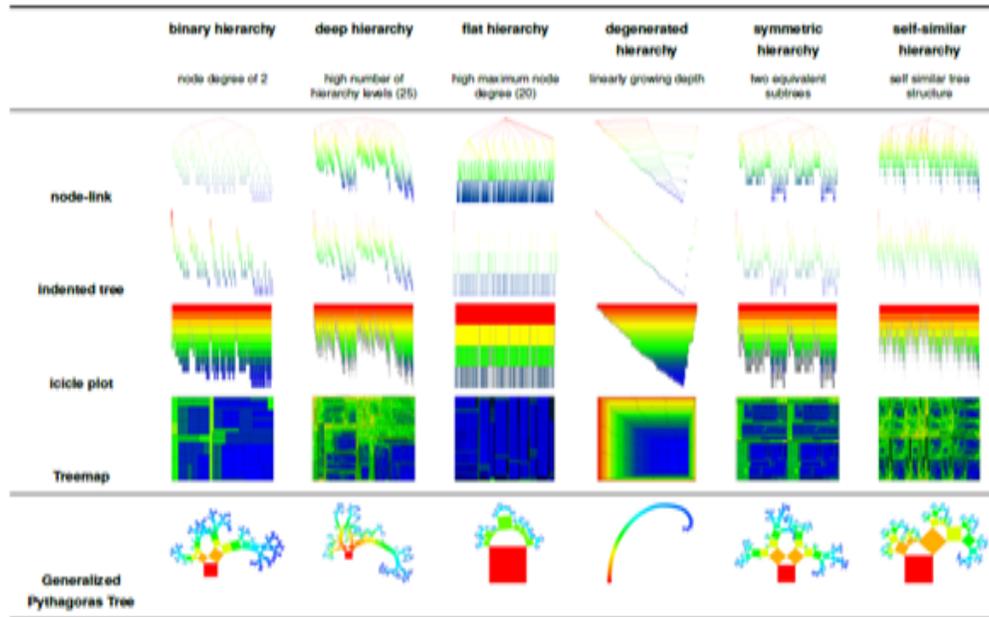
Priorities to visualizing data

- 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

Beck, etc. 2014

Genea quilt (Bezerianos 2010)



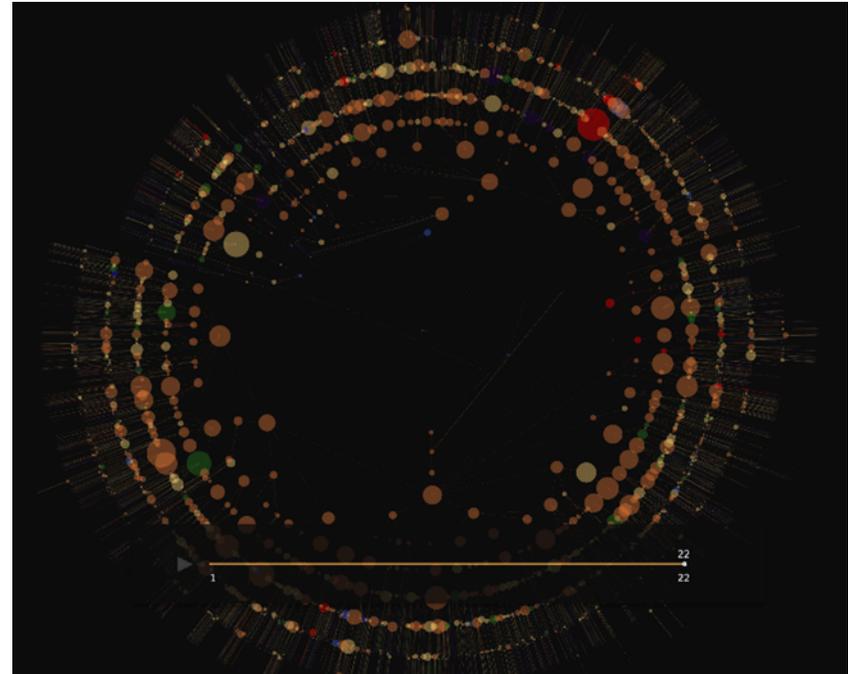
- Limitation of existing methods to a genealogy data
- Distance edge of showing nodal property, information, and influence in a view
 - Not easy to visualize numerous nodes in a view
 - Not easy to put the whole information on each node in a view
 - Not easy to trace impact measurement coefficients of 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

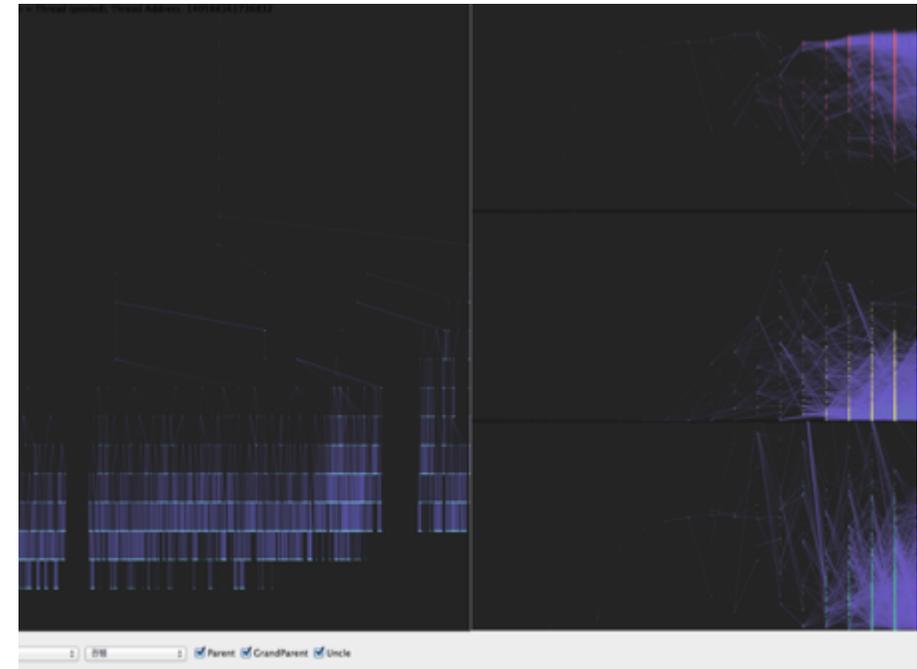
OUTCOME 1

- 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



• Father

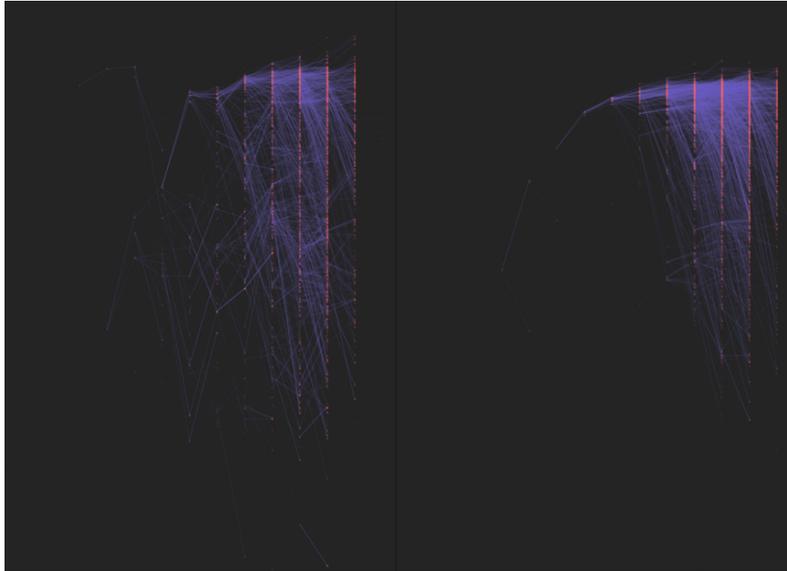
• grandfather

• uncle

Overview of whole data

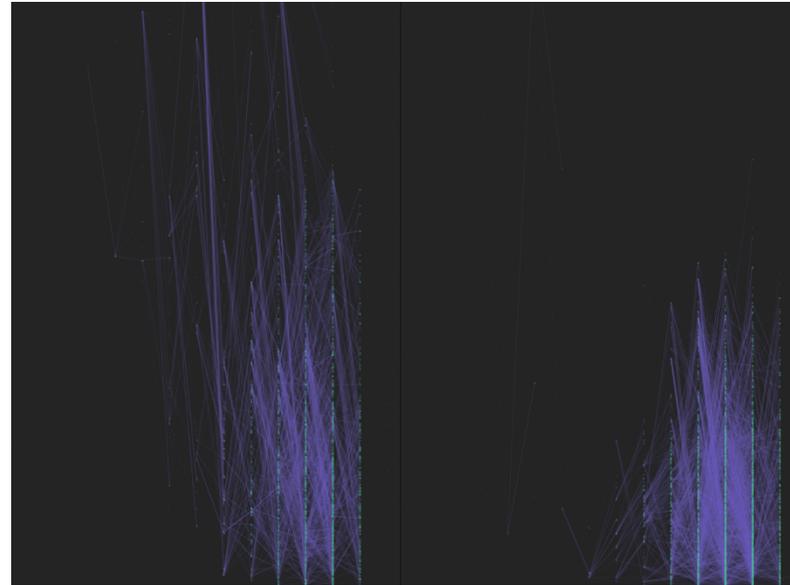
Father's influence

bokyangong sect(left) vs chumilgongsect(right)



Uncle's influence

bokyangong 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