SSHA 2016

Visual Analysis for Human Relationships in Joseon Dynasty

Seongmin Mun, Gyeongcheol Choi, Hyunwoo Han, Tearin Yoon, Jongsik Kim, Kyungwon Lee







Introduction

- History is a filed which empirically examines historical records in order to understand facts and relationships between cause and effect.
- Visual analysis can enable users to better understand data by automatically analyzing and visualizing the data.









Introduction

- First, it shortens time to learn historical records by its automated method.
- Second, Visualized system can help users to understand the results more effectively.









Purpose and Background

- Human relationships in modern society share certain characteristics with in pre-modern period.
- We aim to discover the factors affecting human relationships in Joseon dynasty by analyzing historical records in pre-modern period.









Related Work

000		SocialAction
Data		
Overview 🧼 Rank Nodes	🐵 Rank Edges 💅 Plo	ot Nodes 🦃 Find Communities 🐗 Edge Types 📄 Details 🥥 Settings
Overview		Network Visualization
Network Overview	۲	Font Size: Cabel S
Density	0.51	
Diameter	3	
# of Components	3	Webb (Mikulski) (Graham)
Node Overview	۲	Bingaman Akaka Brownback Corker Sununu Boxer Levin Murray Feinstein Akaka Brownback Domenic Kyl
# of Nodes	98	Biden Casey Cardin Crassley Dole Crassley Dole Crassley
Avg. Degree	49.88	Alayand Daid U. Viohur M.
Highest Degree	88 ^	Inouve Whitebouse Rockefeller Dorgan Showe Warner Warner
Avg. In-degree	24.94	Multichindes Ballou Sanders Malson Ban
Avg. Out-degree	24.94	Control Reed
# of Isolates	2	Colins Coleman Colins Coleman Bennett
Edge Overview	۲	Nelson Bill Stabenow Kohl Tester Ugar Bond Hatch I Inhofe
# of Edges	2444	Champic Champic Allard
# of Bridges	N/A	Cautenbergrown Bayn McCain Cochran Burr
Avg. Path Length	N/A	Lott
Avg. Weight	N/A	

Adam Perer, Ben Shneiderman,"Integrating Statistics and Visualization: Case Studies of Gaining Clarity during Exploratory Data Analysis", CHI 2008 Proceedings · Visual Synthesis, pp. 265-274, 2008.

Annals of the Joseon Dynasty

- The Annals of the Joseon Dynasty are the annual records of the Joseon Dynasty of Korea.



Preprocessing

- In human relationship data, People who agree with a issue are represented in 1, have no idea in 0, disagree in -1.

순번 🕚	IC		성	•	명	▼	Fullnan 🔻	관직	▼	관품	-	사건1- 🔻	사건1- 🔻	사건1- 🔻	사건1- 🔻	사건1- 💌	사건2 🔻
	1		하		연		하연	영의정부사			1	-1	-1	1	1	1	0
	2		허		후		허후	예조판서			2	-1	-1	1	1	1	0
	3		0		선제		이선제	동지춘추관사			2	-1	-1	1	1	1	0
	4		정		척		정척	예조참판			2	-1	-1	1	1	1	0
	5		김		종서		김종서	좌찬성			1	0	0	1	1	1	0
	6		정		갑손		정갑손	좌참찬			2	1	1	1	1	1	0
	7		신		석조		신석조	집현전부제학			3	1	1	1	1	1	0
	8		노		숙동		노숙동	직제학			3	1	1	1	1	1	0
	9	1686	0		석형		이석형	직협전직제학			3	1	1	1	1	1	0
1	0		김		예몽		김예몽	응교			4	1	1	1	1	1	0
1	1		0		개		이개	교리			5	1	1	1	1	1	1
1	2		유		성원		유성원	수찬			6	1	1	1	1	1	0
	3	6267	0		극감		이극감	수찬			6	1	1	1	1	1	0
1	4	4671	서		거정		서거정	수찬			6	1	1	1	1	1	0

User Tasks and Design Objectives

- **Task 1:** Calculating the similarity between each figure and Geojeong Seo in each agenda.
- **Design Objective:** We should create an axis that indicates similarity levels as to mark the relationships on it.

$$\Phi coefficient = \Phi = \frac{n_{11}n_{00} - n_{10}n_{01}}{\sqrt{n_1 n_0^* n_0^* n_1^* n_0^* n_1^* n$$







User Tasks and Design Objectives

- **Task 2:** Classifying agenda to present human relationships in specific categories.
- Design Objective: Users should be able to select each classification and human relationships will be changed according to each category.









User Tasks and Design Objectives

- **Task 3:** Presenting figures based on the blood relationship and degree of kinship.
- **Design Objective:** We need to visually distinguish relationships between people who have blood relationship or not.

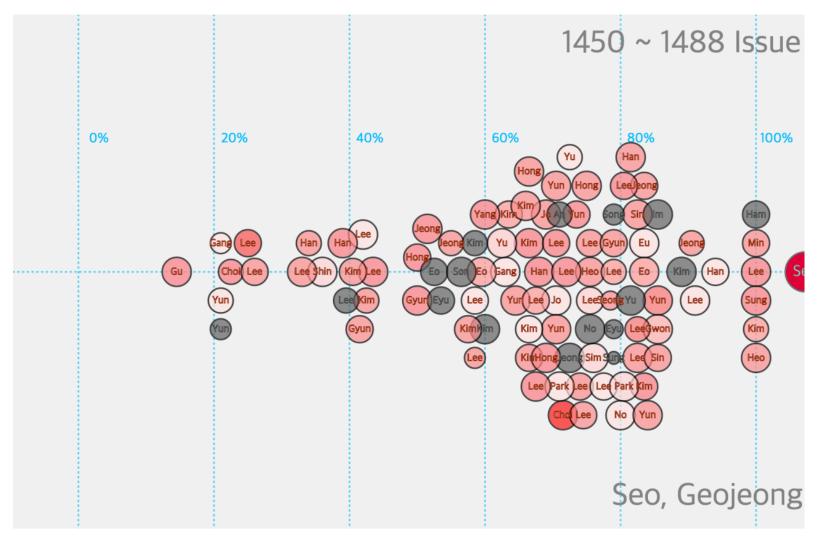




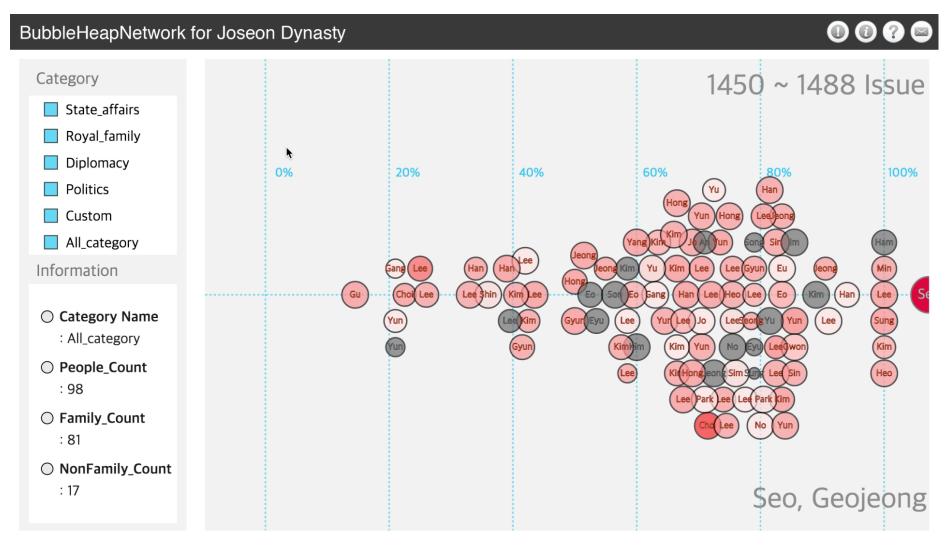




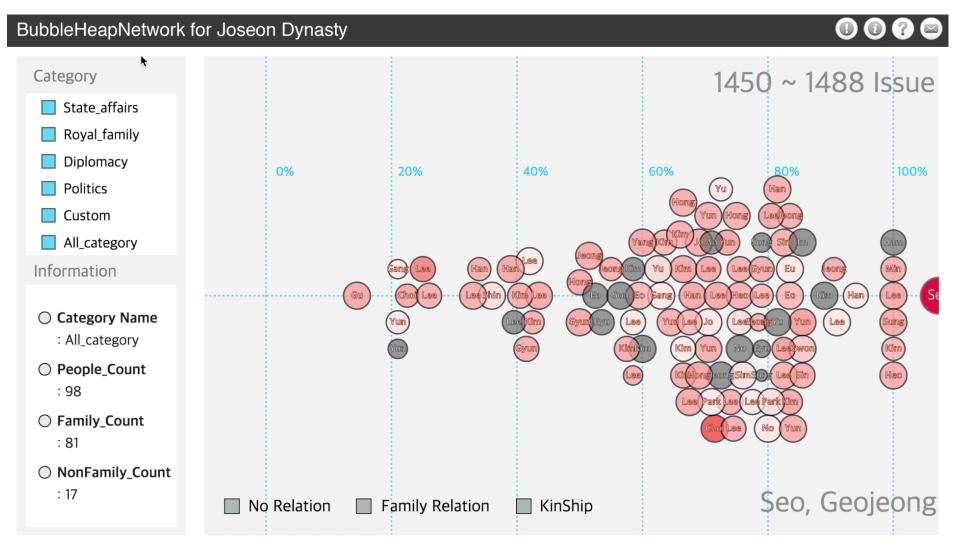
- **Task 1:** Calculating the similarity between each figure and Geojeong Seo in each agenda.



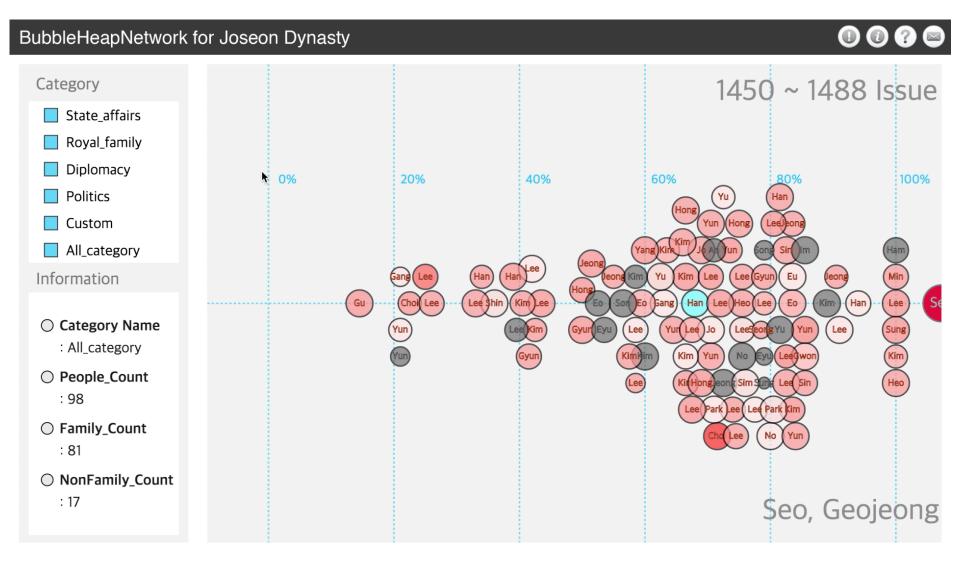
- Task 2: Classifying agenda to present human relationships in specific categories.



- Task 3: Presenting figures based on the blood relationship and degree of kinship.

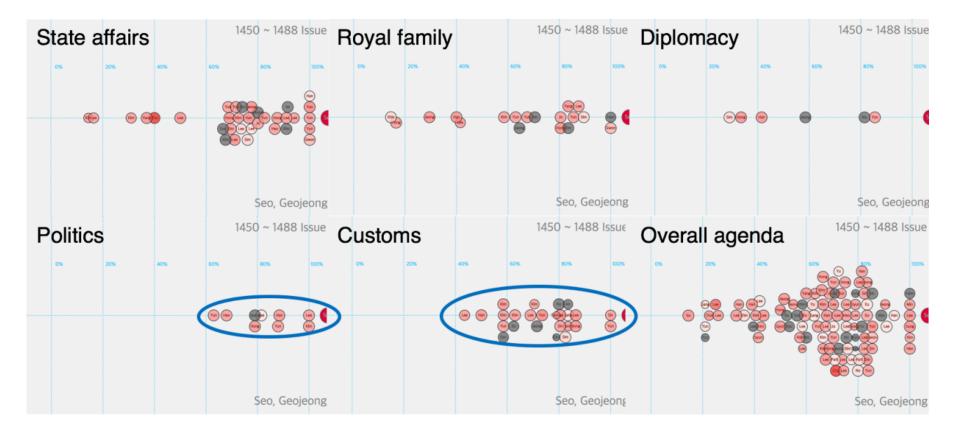


- Other function of visualization.



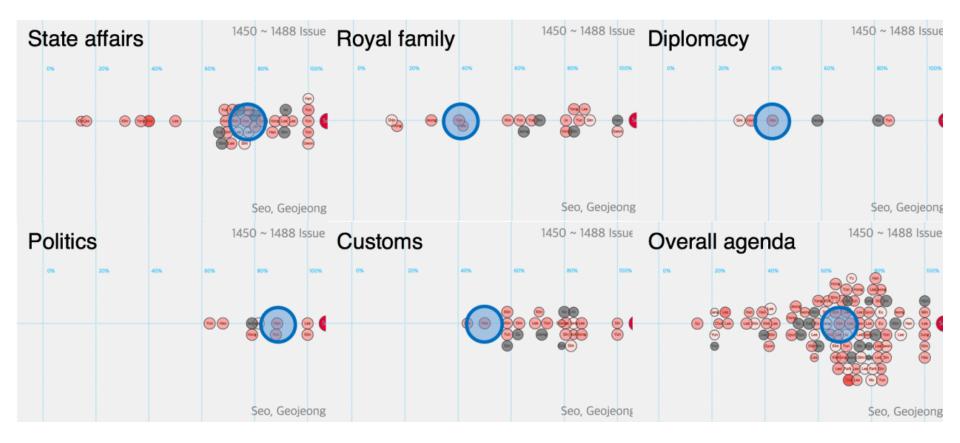
Scenario for the Visual Analysis

- Scenario 1: Is there a difference in voting patterns if the nature of agenda changes?



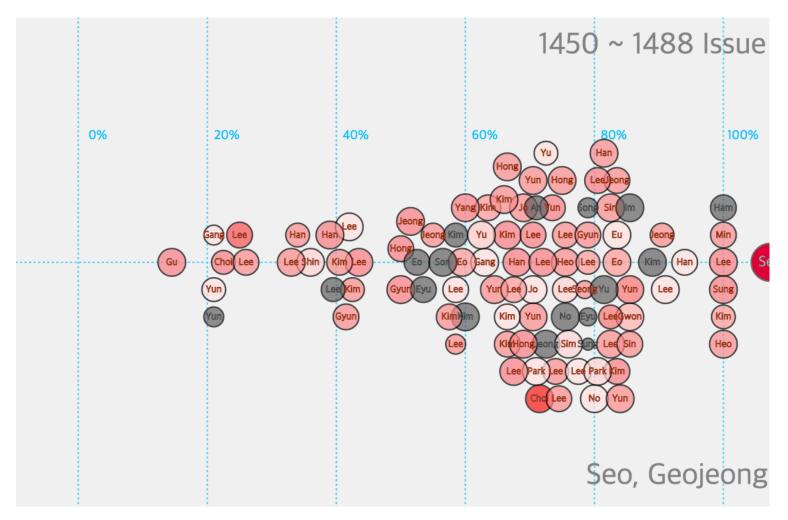
Scenario for the Visual Analysis

- Scenario 2 : Will an individual show different voting patterns if the nature of agenda changes?



Scenario for the Visual Analysis

- Scenario 3 : Will kinship affect the similarity level in voting patterns?



Research Conclusion

- First, historical events can be classified into five categories, and the opinions on each agenda will vary according to the nature of agendas.
- Second, each figure indicate different opinions in different sets of agendas.
- Third, blood relationship cannot be affected the similarity level of voting patterns.









Demonstration

- http://202.30.24.167:3007/SSHA2016

