# **Towards Better Understanding: Proposing Effective** Visualization Methods for Analyzing Argument in Debate

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This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea(NRF-2020S1A5A2A01043532 & RS-2022-00156318).

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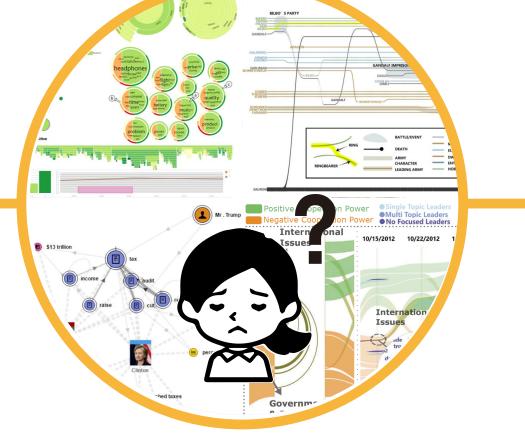
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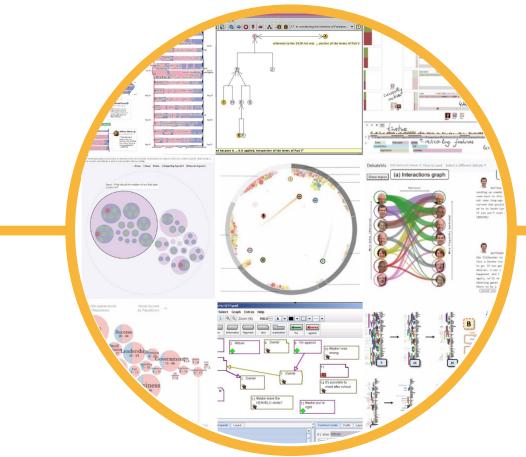
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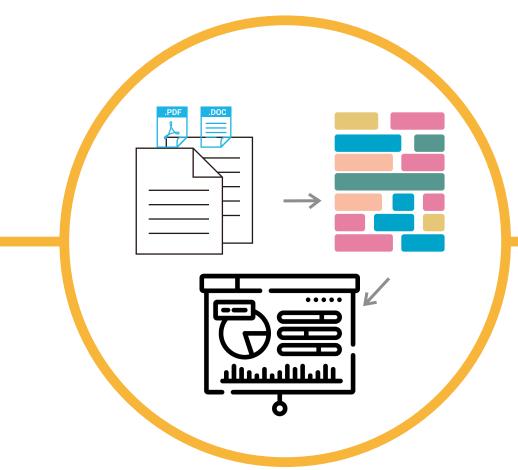


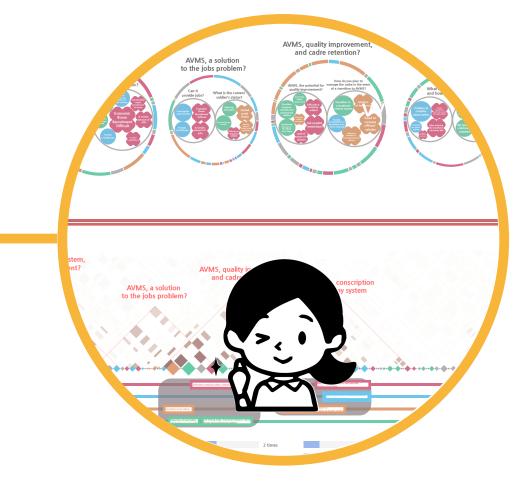
# Introduction











Debate is an important process in which participants exchange different perspectives and information to reach a reasonable conclusion.

Analyzing arguments during a debate is complex and in an environment where topics and arguments are constantly changing, it's important to find important arguments and compare participants perspectives.

As a result, many researchers are turning to visualization to alleviate the complexity of debate analysis.

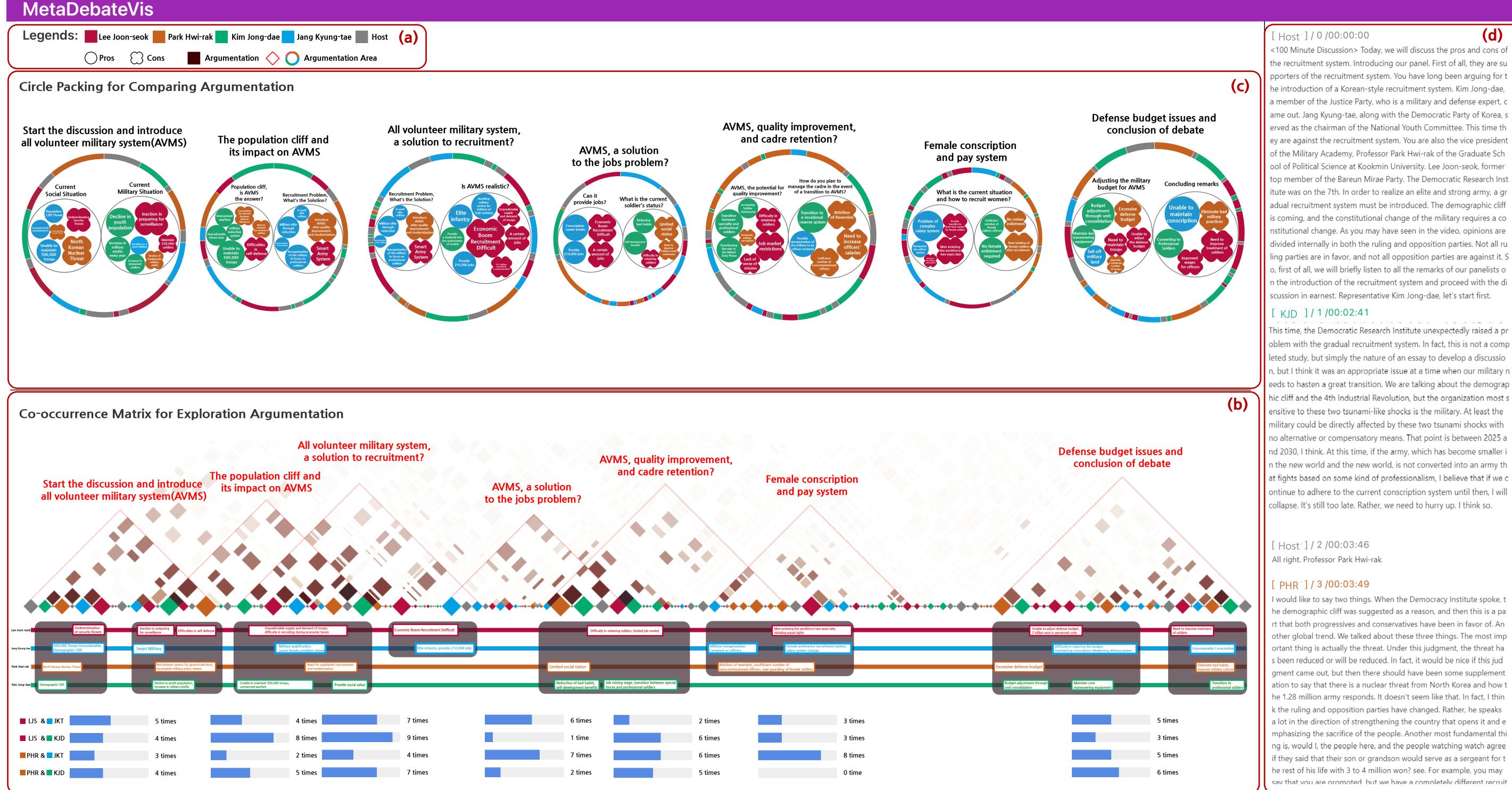
Our work presents visualization methods for debate analysis, including co-occurrence matrix for argument detection and circle packing for argument comparison and script

The system helps users detect key topics and contentious areas, identify key participants and keywords, and provides a clear picture of the overall flow and structure of the debate.

(d)

# **Visualization Overview**

viewers of key utterances.



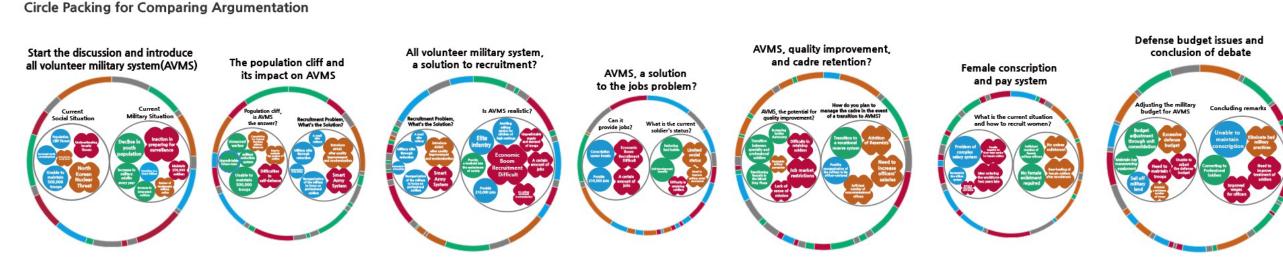
a) Legends: Represents the information and argumentation of the debaters.

b) Co-occurrence Matrix: Displays debaters argument relationships. Accompanied by a keyword graph and a contention bar chart.

c) Circle Packing: Displays the primary keywords within each debate topic, facilitating a comparison of the pros and cons on each issue.

d) Script Viewer: Located on the right side of the interface, it allows users to access detailed transcripts of the debate participants' contributions.

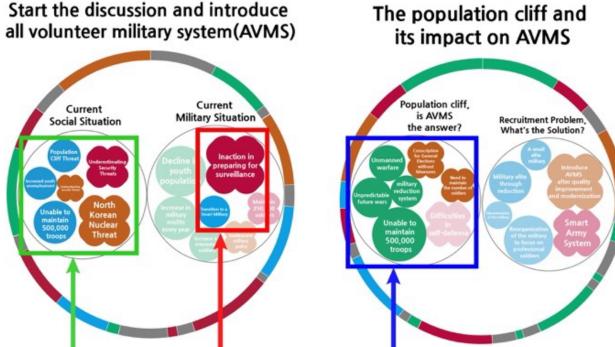
### Main Visualization



**Summary of Circle Packing and Design** 

Visualize topics, subtopics, keywords, and participant opinions in a debate. Participation is represented by the size of circles, positions (pro/con) by shapes, and keywords by text.

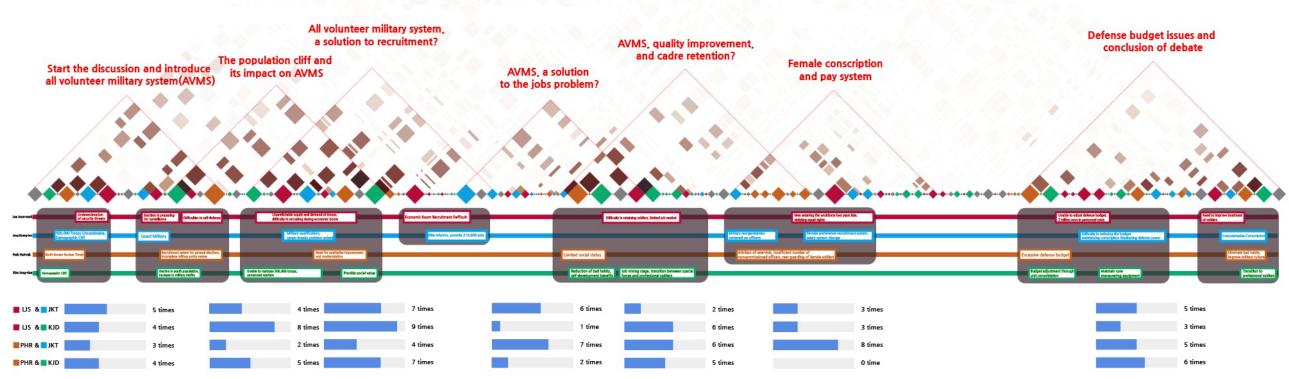
## **Usage Scenario**



• User want to analyze the important parts of the first and second debate topic sections start the debate and introduce all volunteer military system(AVMS)" and "The population and its impact on AVMS.

• The main arguments in the debate sections

I would like to say two things. When the Democracy Institute spoke, t he demographic cliff was suggested as a reason, and then this is a pa rt that both progressives and conservatives have been in favor of. An other global trend. We talked about these three things. The most imp ortant thing is actually the threat. Under this judgment, the threat ha s been reduced or will be reduced. In fact, it would be nice if this jud gment came out, but then there should have been some supplement ation to say that there is a nuclear threat from North Korea and how t he 1.28 million army responds. It doesn't seem like that. In fact, I thin k the ruling and opposition parties have changed. Rather, he speaks a lot in the direction of strengthening the country that opens it and e mphasizing the sacrifice of the people. Another most fundamental thi ng is, would I, the people here, and the people watching watch agree if they said that their son or grandson would serve as a sergeant for t he rest of his life with 3 to 4 million won? see. For example, you may say that you are promoted, but we have a completely different recruit



The design visually shows the engagement of participants and their opinions on the topic of the debate.

**Co-Occurrenece Matrix for Exploration Argumentation** 

#### Summary of Co-occurrence Matrix and Design

The colors of the nodes represent the participants in the debate, and the red rectangles represent the topics of the debate. The visualization shows the structure and flow of the debate, while the design represents the overall flow of the debate and its key participants, depth, and topics. Bar charts and keyword plots show the main activities of participants in the debate.

The design is based on the conditions under which arguments occur in a debate, and this visualization provides a visual representation of the overall flow of the debate, the main participants, and the depth and topic of the argument.

The population cliff and Start the discussion and introduce ts impact on AVMS all volunteer military system(AVMS)

such as Type1, Type2 and Type3 can be seen through interaction between co-occurrence matrix and circle packing.

• This visualization provides a holistic and intuitive snapshot of the debate enhancing the user's understanding and analysis of the debate.



#### **Debate Analysis Guideline** — Type 2 — Type 3 Type 1

• User use both visualizations to effectively represent the argument parts of the debate in circle packing and see where the debate is deepening through correlation saturation in the co-occurrence matrix.