Large-scale Argument Visualization (LSAV)

Dana Khartabil, Simon Wells, Jessie Kennedy

Institute for Informatics and Digital Innovation, Edinburgh Napier University, Edinburgh, UK.

Edinburgh Napier UNIVERSITY

Abstract

❖ Arguments are structures of premises and conclusions that underpin rational reasoning processes.

❖ Visualisation tools have been developed to support argument analysts and help them to work with arguments.

❖ Larger argument datasets present problems for the current generation of argument visualization tools.

❖ We propose a tool for interacting with argument corpora that enable users to explore and understand the reasoning structure of large-scale arguments.

Visualization Approach

Present large-scale arguments
➕ Radial adjacency layout
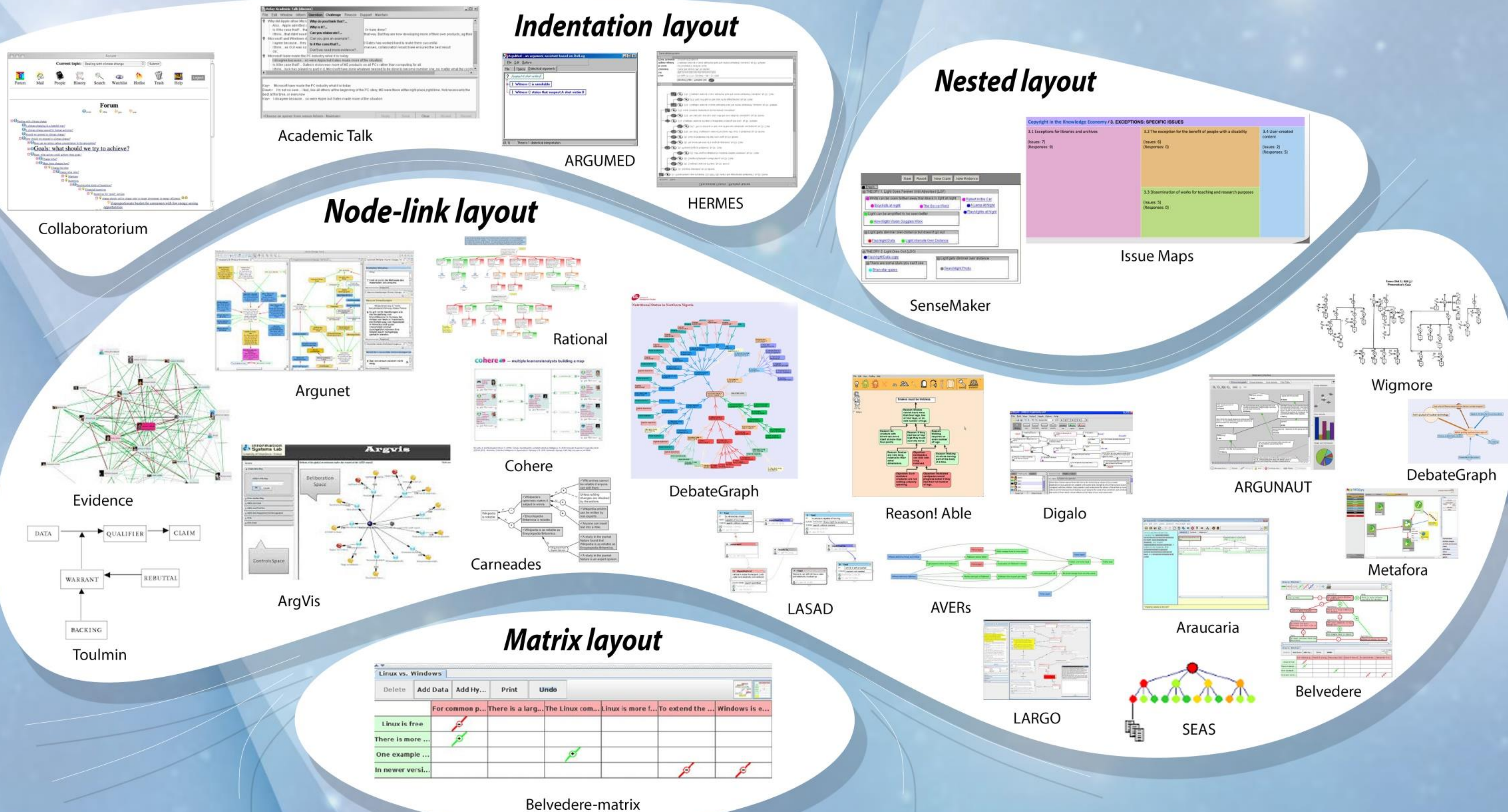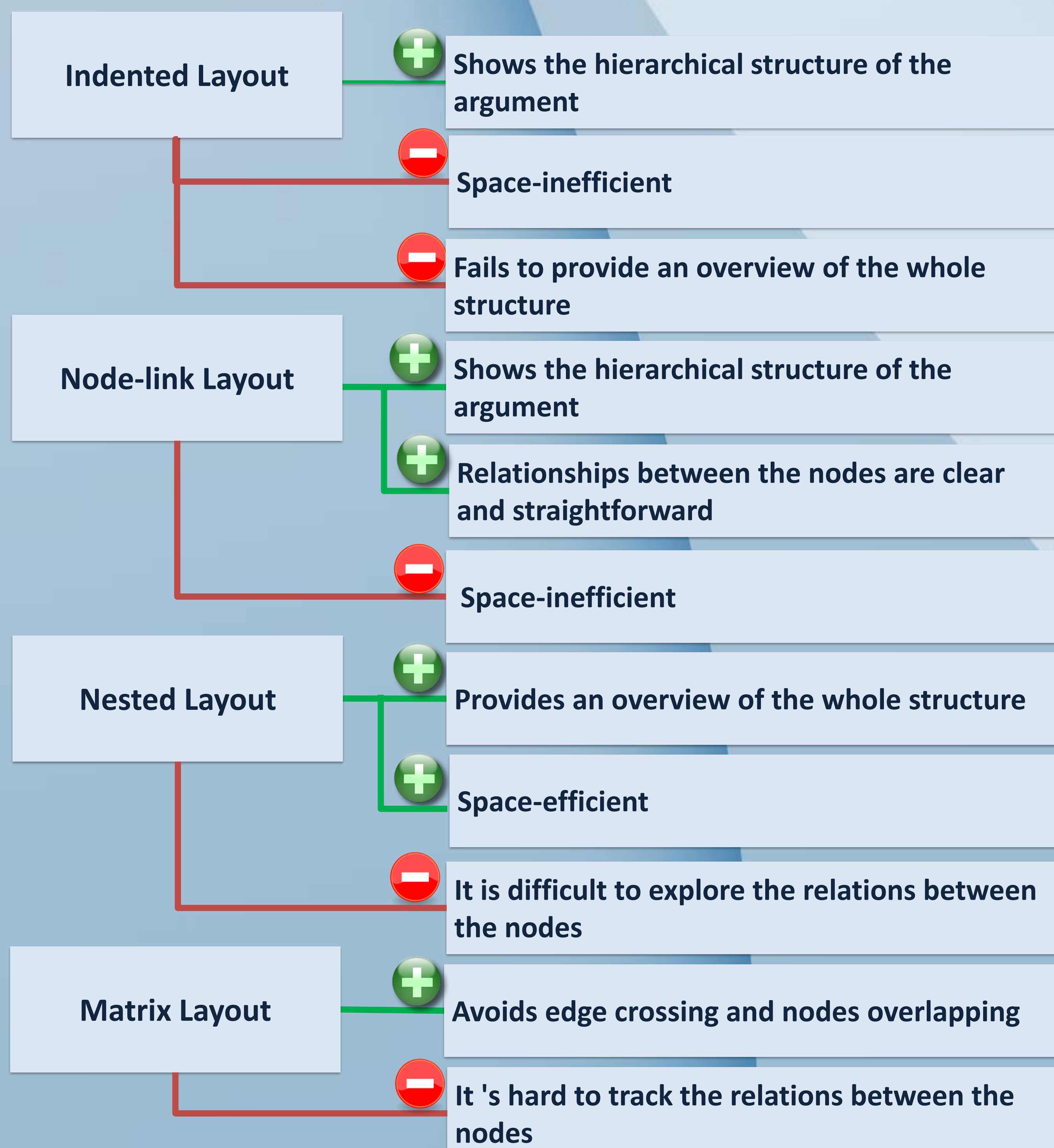
Quick navigate of the whole structure
➕ Fisheye technique
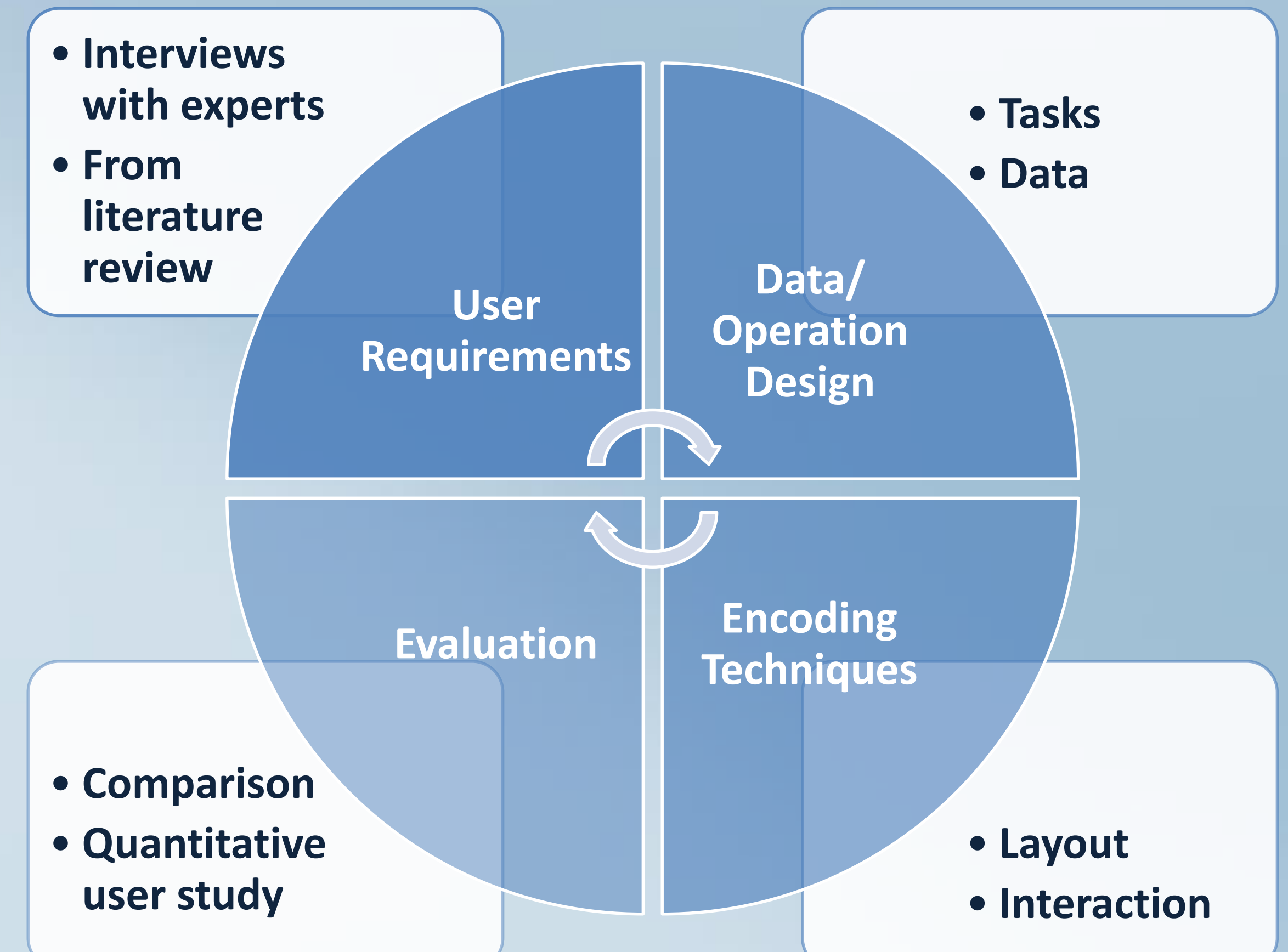
Ability to save and share argument graphs
➕ Using D3 and Argument Interchange Format (AIF)

Indentation layout — Academic Talk, ARGUMED, HERMES, Collaboratorium

Nested layout — Issue Maps, SenseMaker

Node-link layout — Argunet, Rational, Cohere, Evidence, DebateGraph, ArgVis, Carneades, Reason! Able, Digalo, LASAD, AVERs, Araucaria, Wigmore, DebateGraph, ARGUNAUT, Metafora, Belvedere, LARGO, SEAS, Toulmin

Matrix layout — Belvedere-matrix

Argument Visualization Layout

Indented Layout
➕ Shows the hierarchical structure of the argument
➖ Space-inefficient
➖ Fails to provide an overview of the whole structure

Node-link Layout
➕ Shows the hierarchical structure of the argument
➕ Relationships between the nodes are clear and straightforward
➖ Space-inefficient

Nested Layout
➕ Provides an overview of the whole structure
➕ Space-efficient
➖ It is difficult to explore the relations between the nodes

Matrix Layout
➕ Avoids edge crossing and nodes overlapping
➖ It 's hard to track the relations between the nodes

Methodology

- Interviews with experts
- From literature review

User Requirements

- Tasks
- Data

Data/Operation Design

Evaluation
- Comparison
- Quantitative user study

Encoding Techniques
- Layout
- Interaction

Conclusion

We propose an argument visualization tool that can usefully handle arguments at increasing scale. This will help stakeholders to reach decisions by enabling them to navigate through arguments, explore logical reasons, and understand relations between arguments. Stakeholders may include policy and health analysts, academics, and employees, etc.