



BiDots

Visual Exploration of Weighted Biclusters

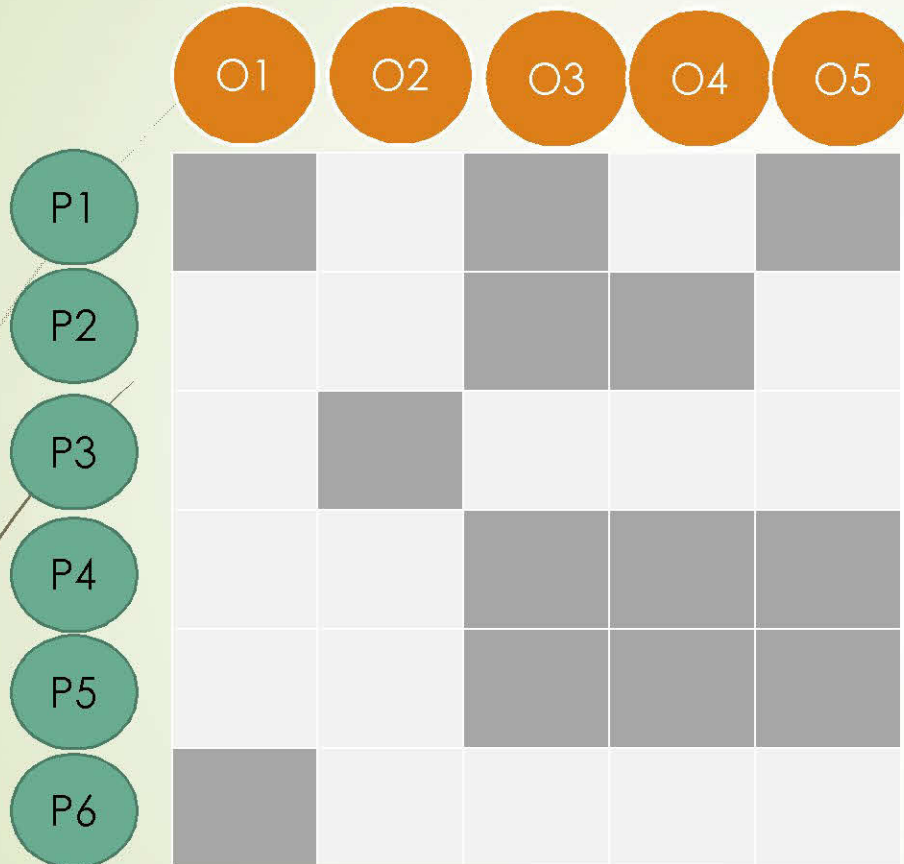
Jian Zhao, Maoyuan Sun, Francine Chen, and Patrick Chiu

Presented by Siyuan He

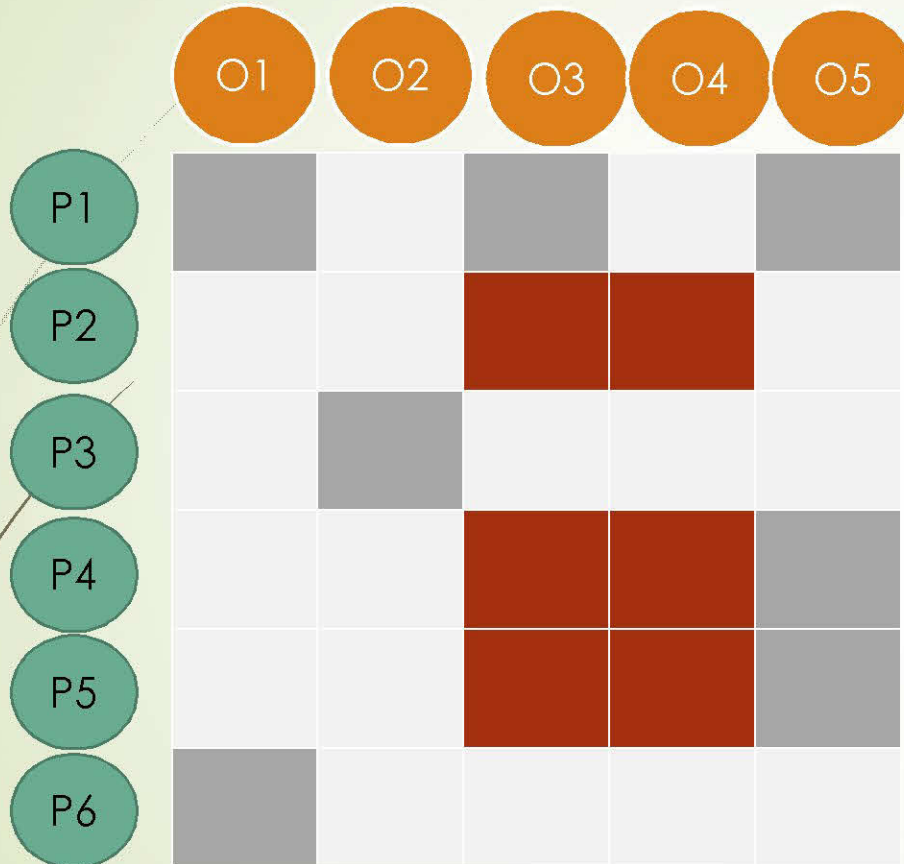
What's a bicluster?

- ▶ A *cluster* is a set of entities.
- ▶ A **bicluster** is two sets of entities and their relationships

Bicluster Example



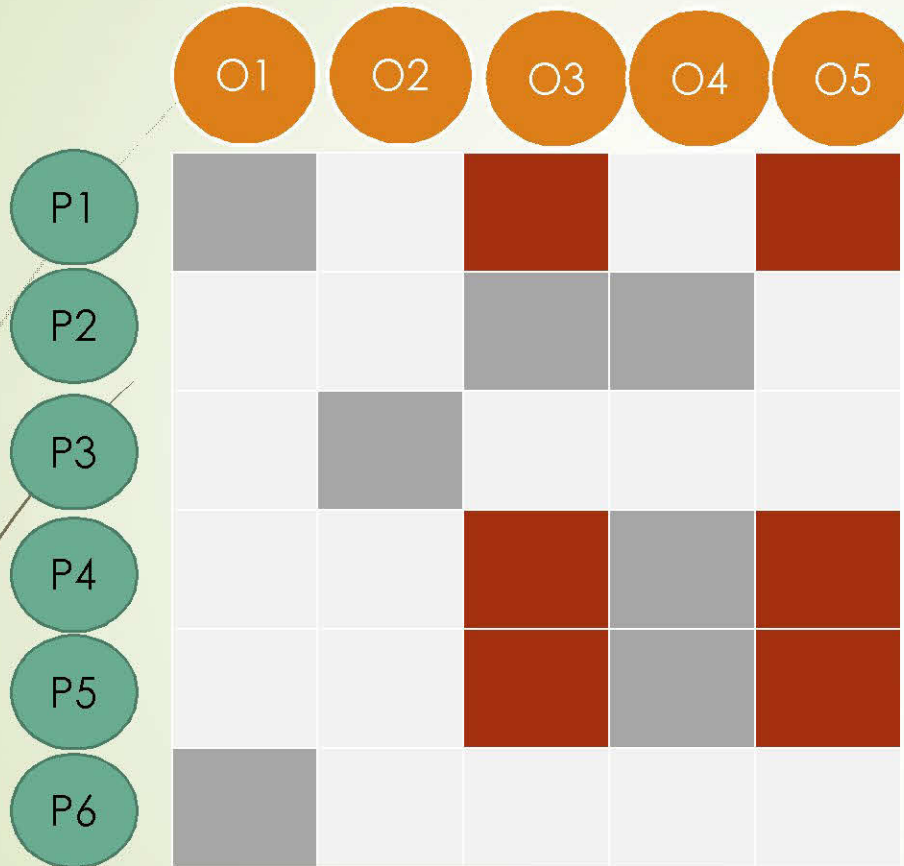
Bicluster Example



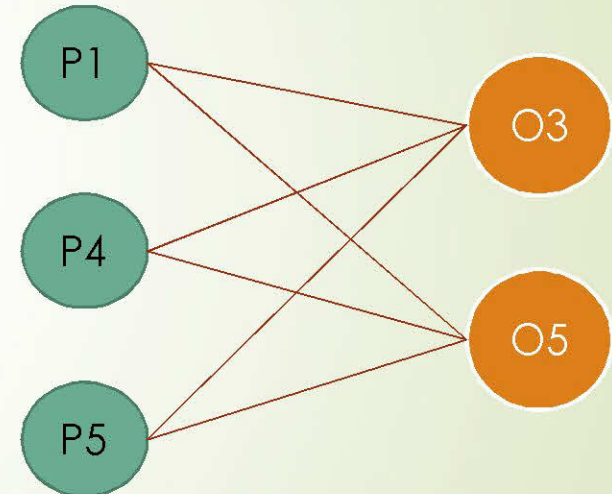
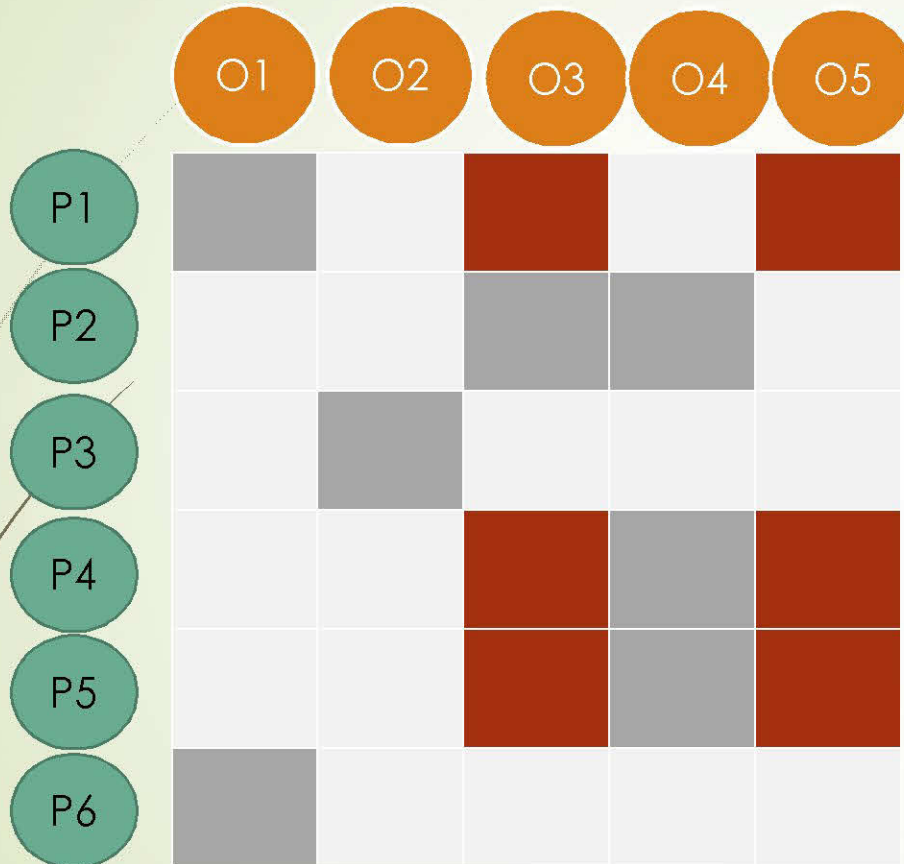
$$O = \{O3, O4\}$$

$$P = \{P2, P4, P5\}$$

Bicluster Example



Bicluster Example

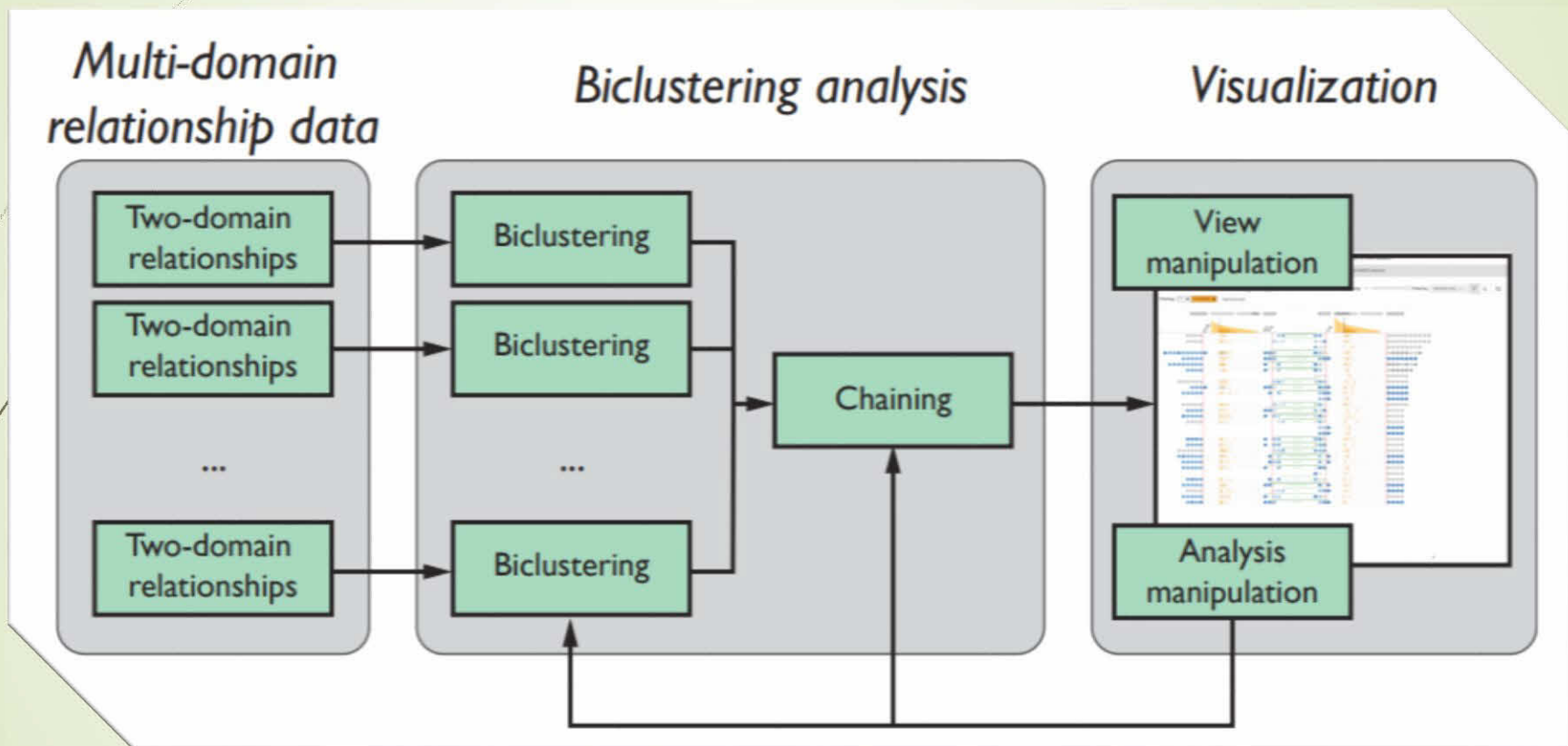


Main Contributions of the paper

- ▶ Visualizing biclusters with relationship weights
 - ▶ Example: Likelihoods, gene expression levels.

- ▶ Visualizing biclusters across multiple domains
 - ▶ A bicluster matching and chaining algorithm

System Overview



BiDots: Visual Exploration of Weighted Biclusters. Jian Zhao, Maoyuan Sun, Francine Chen, Patrick Chiu. Proc. InfoVis 2017, IEEE TVCG to appear.

Visualization (One pair of domains)

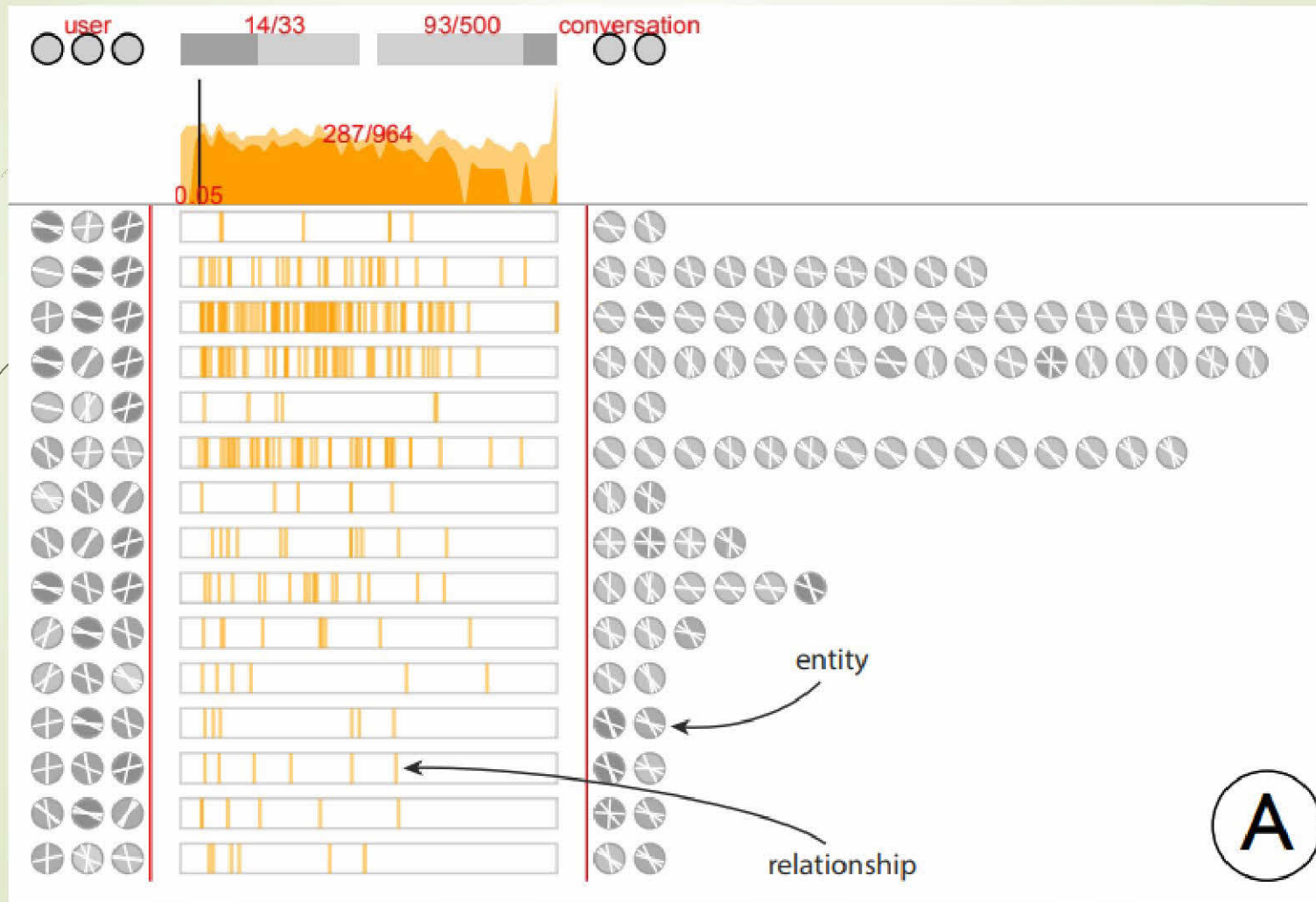


Image from
the paper

Visualization (One pair of domains)

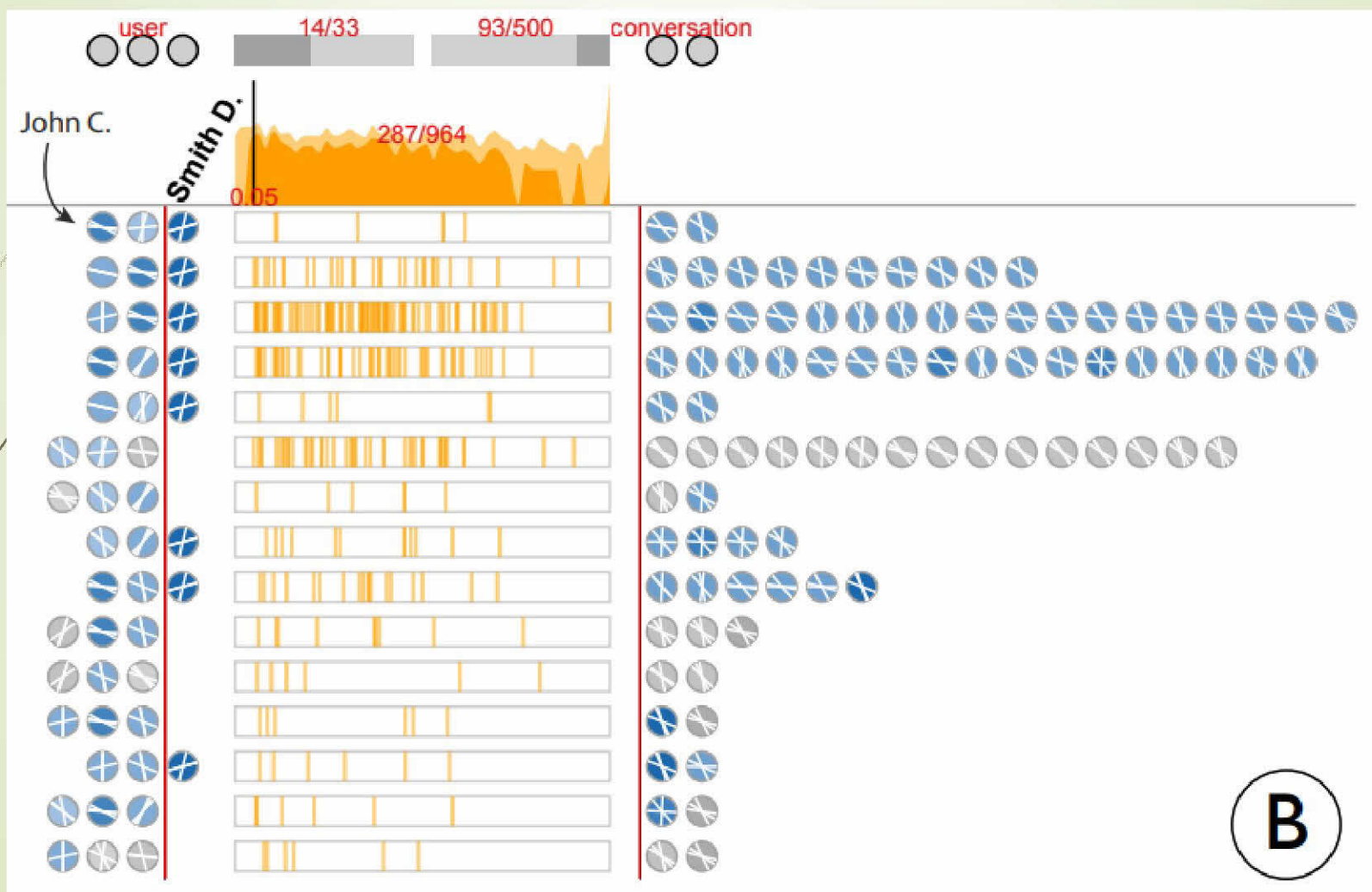


Image from
the paper

Visualization(One pair of domains)

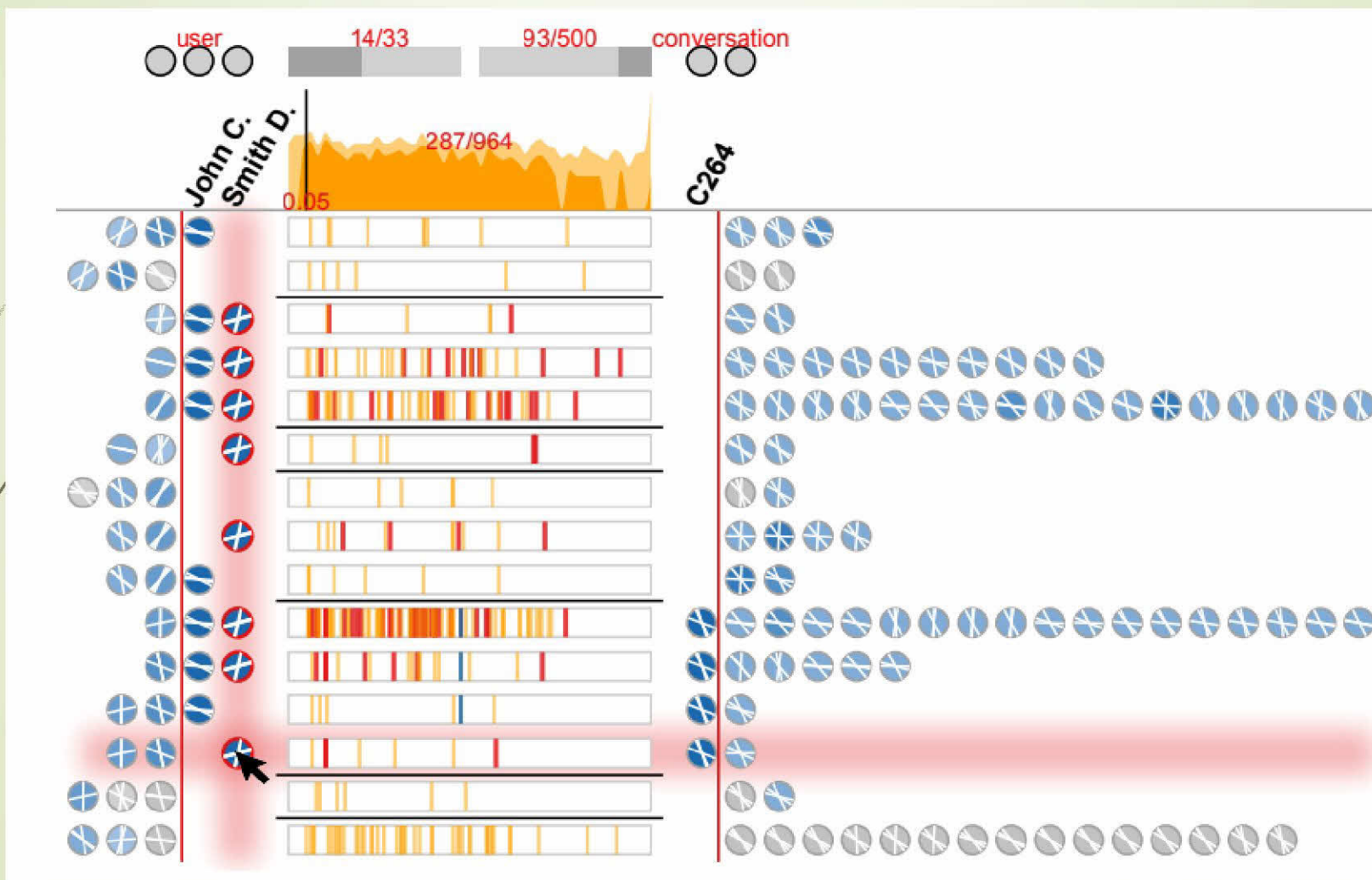


Image from
the paper

Two pairs of domains

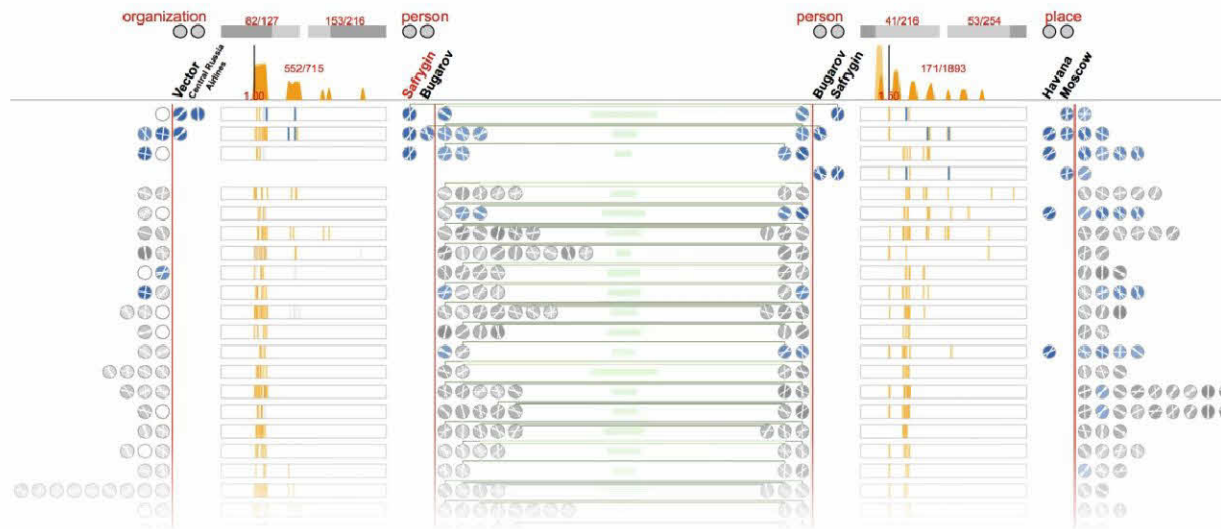
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Image from the paper

Usage Scenario

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BiDots: Visual Exploration of Weighted Biclusters

Jian Zhao, Maoyuan Sun, Francine Chen, and Patrick Chiu



System	BiDots
What: Data	Tables (Graphs)
What: Derived	Biclustering of tables (Biclusters).
Why: Tasks	Find, Compare Biclusters. Explore entity co-occurrences. Analyze biclusters across multiple domains
How: Encode	Entity with line orientation and saturation. Relation weights with line strips aligned on common scale. Histogram.



Image from
the paper

VAD

System	BiDots
How: Manipulate	Reorder, Realign, Animated transitions; Hovering highlighting
How: Facet	Linked Highlighting
How: Reduce	Filtering
Scale	Several dozens of biclusters per pair of domains limited to several pairs of domains.



Image from the paper

Strength and Weaknesses

Strength

- ▶ Adjustable Filtering Parameters
- ▶ Grouping Biclusters
- ▶ Visual Linking

Weaknesses

- ▶ Entity encoding
- ▶ Bicluster relation encoding
- ▶ Difficult to locate an entity



Critique

- Difficult to navigate if the number of biclusters is huge.
- Duplicate entities across different biclusters.
- The size of biclusters cannot too large.



Further Readings

- ▶ [BiDots: Visual Exploration of Weighted Biclusters](#). Jian Zhao, Maoyuan Sun, Francine Chen, Patrick Chiu. Proc. InfoVis 2017, IEEE TVCG to appear.
- ▶ [Demo: BiDots: Visual Exploration of Weighted Biclusters](#)
<https://www.youtube.com/watch?v=79VSgVII11M>