

# BiDots

Visual Exploration of Weighted Biclusters  
 Jian Zhao, Maoyuan Sun, Francine Chen, and Patrick Chiu  
 Presented by Siyuan He

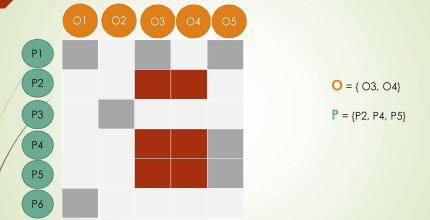
## 2 What's a bicluster?

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

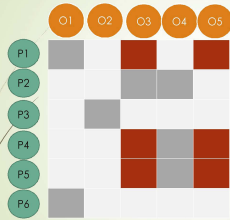
## 3 Bicluster Example



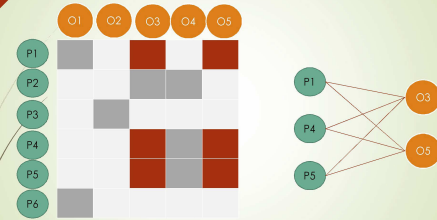
## 4 Bicluster Example



## 5 Bicluster Example



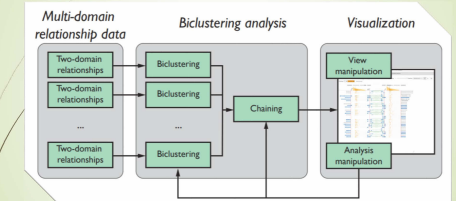
## 6 Bicluster Example



## 7 Main Contributions of the paper

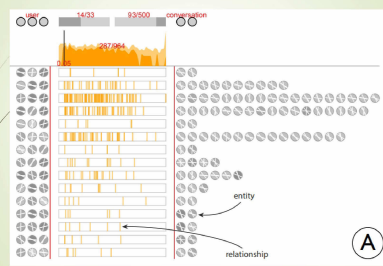
- Visualizing biclusters with relationship weights
  - Example: Likelihoods, gene expression levels.
- Visualizing biclusters across multiple domains
  - A bicluster matching and chaining algorithm

## 8 System Overview



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

## 9 Visualization (One pair of domains)



A Image from the paper

## 10 Visualization (One pair of domains)



B Image from the paper

## 11 Visualization (One pair of domains)

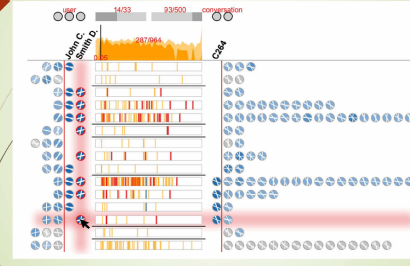


Image from the paper

## 12 Two pairs of domains

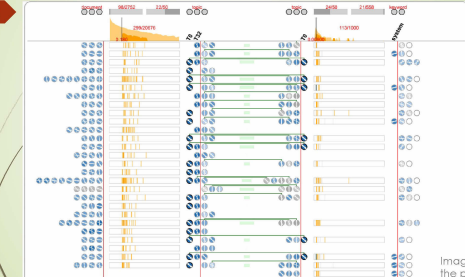
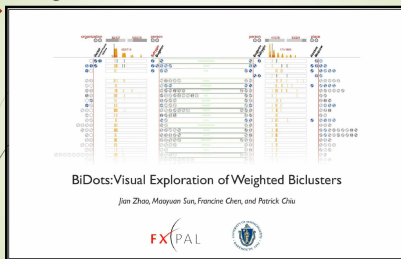


Image from the paper

## 13 Usage Scenario



## 14 VAD

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

## 15 VAD

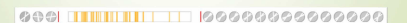
System	BiDots
How: Manipulate	Reorder, Realign, Animated transitions; Hovering highlighting
How: Facet	Linked Highlighting
How: Reduce	Filtering
Scale	Several dozens of biclusters per pair of domains limited to several pairs of domains.



Image from the paper

## 16 Strength and Weaknesses

- |  |   |
|--|---|
| <b>Strength</b> <ul style="list-style-type: none"> <li>Adjustable Filtering Parameters</li> <li>Grouping Biclusters</li> <li>Visual Linking</li> </ul> | <b>Weaknesses</b> <ul style="list-style-type: none"> <li>Entity encoding</li> <li>Bicluster relation encoding</li> <li>Difficult to locate an entity</li> </ul> |
|--|---|



## 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=79V5gVl11M>