Information Visualization

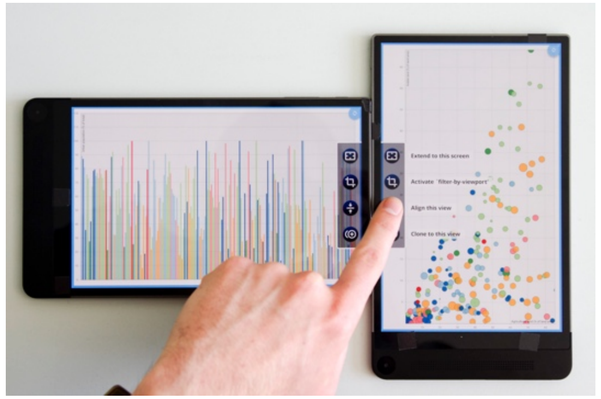
Multiple Views

Dr. David Koop

Visualization on Devices other than Personal Computers

VisTiles

[Langner, Horak, and Dachselt, VIS 2017]



David Meets Goliath

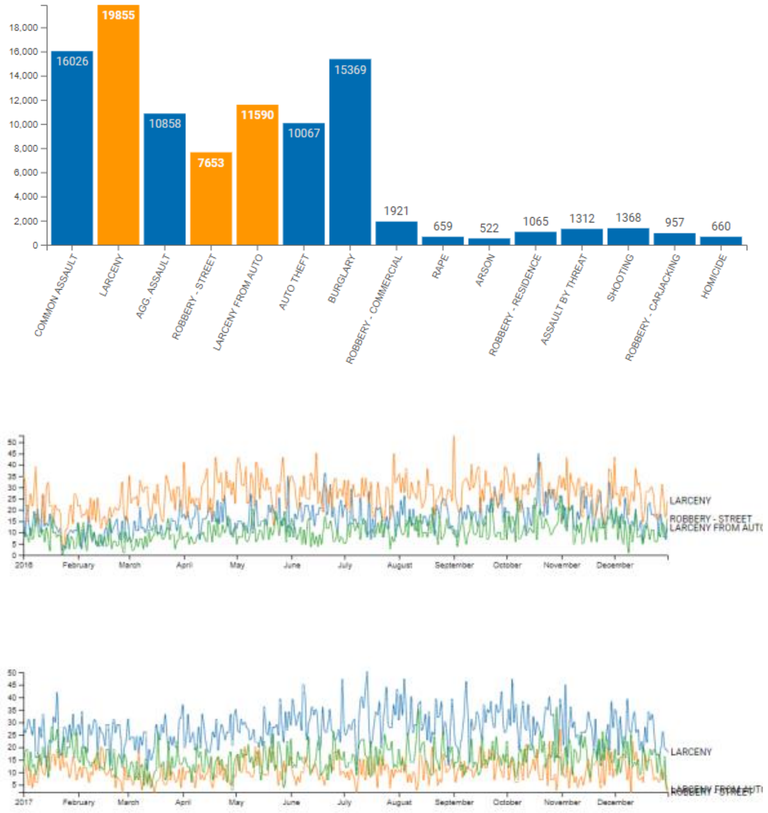
[Horak, Badam, Elmqvist, and Dachselt, CHI 2018]

Now: **Large Wall-sized Displays**

⊕ More data ⊕ More views ⊕ More users

[R. Langner et al.]

Visualizations are more than just views



Visualizations have a rich body of characteristics and certain relationships to other visualizations

Visualization Type

Encoding

Size

Data Points

Visual Density

Internal State

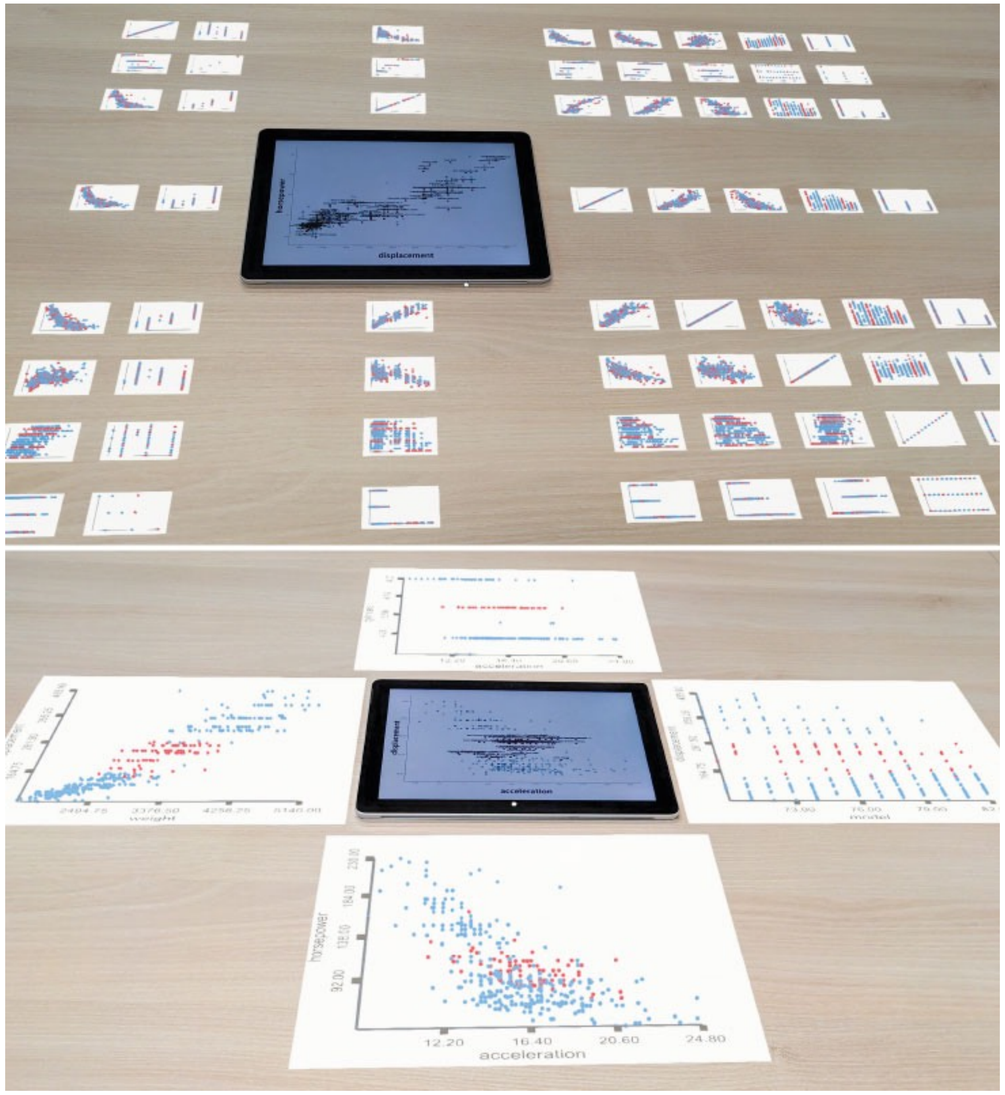
Axis

Data Source

Idea: Considering these aspects alongside device properties and user preferences

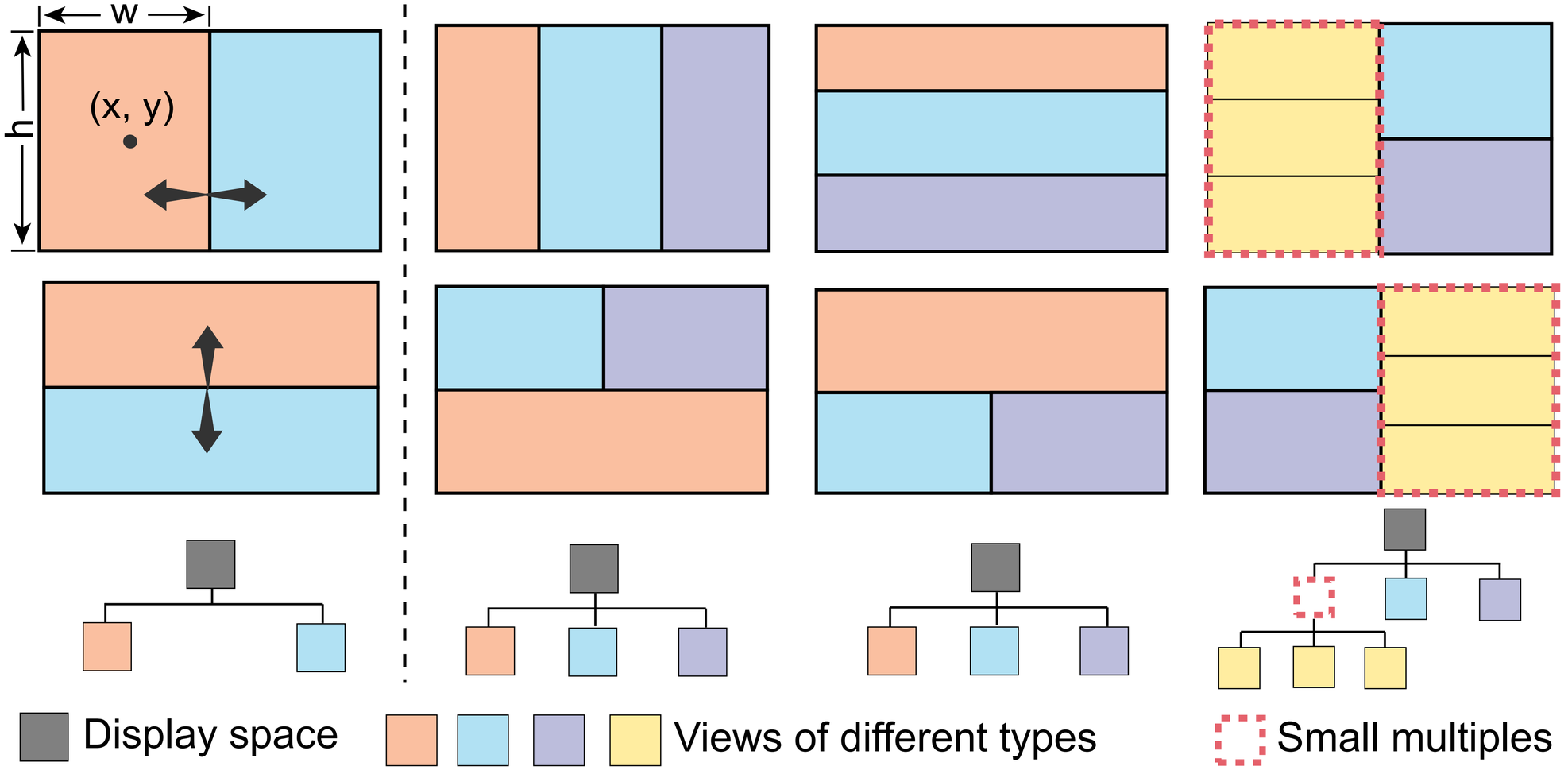
[Horak et al., 2019]

Adding Augmented Reality



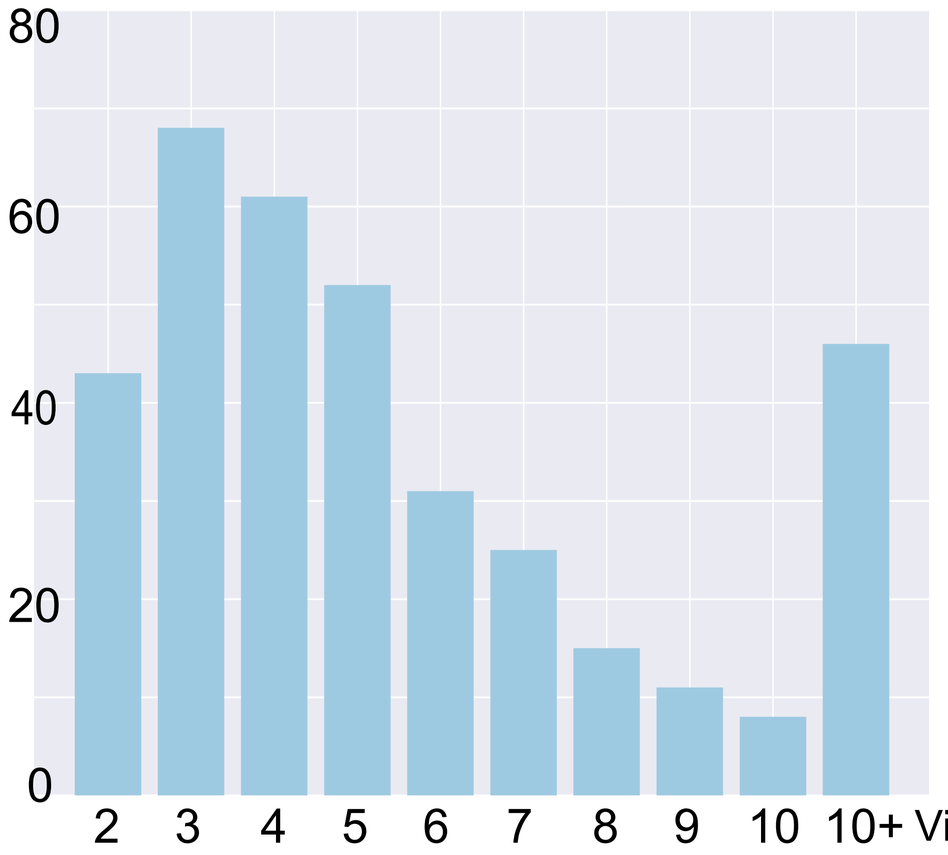
[Langner et al., 2021]

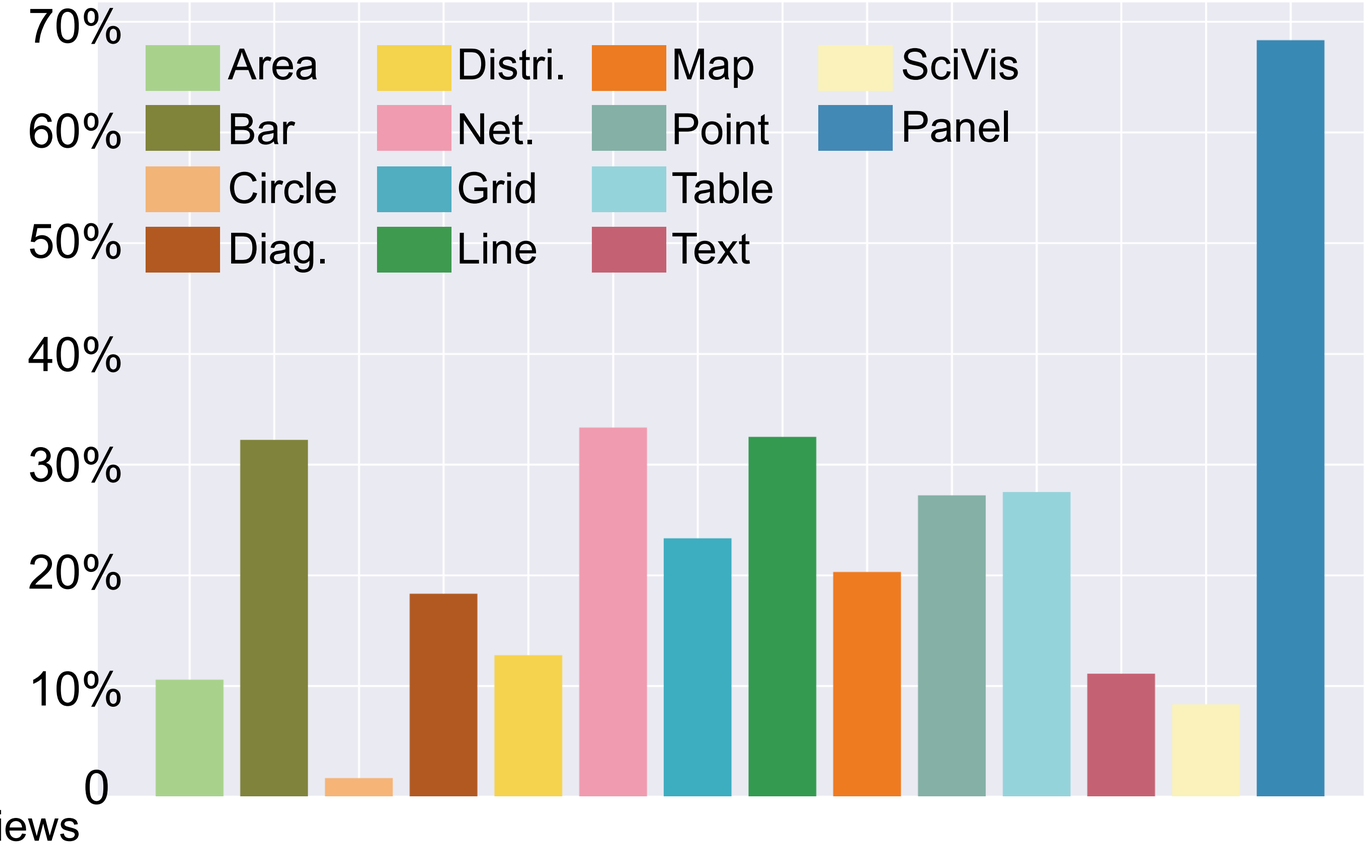
Classifying MV Layouts



[Chen et al.]

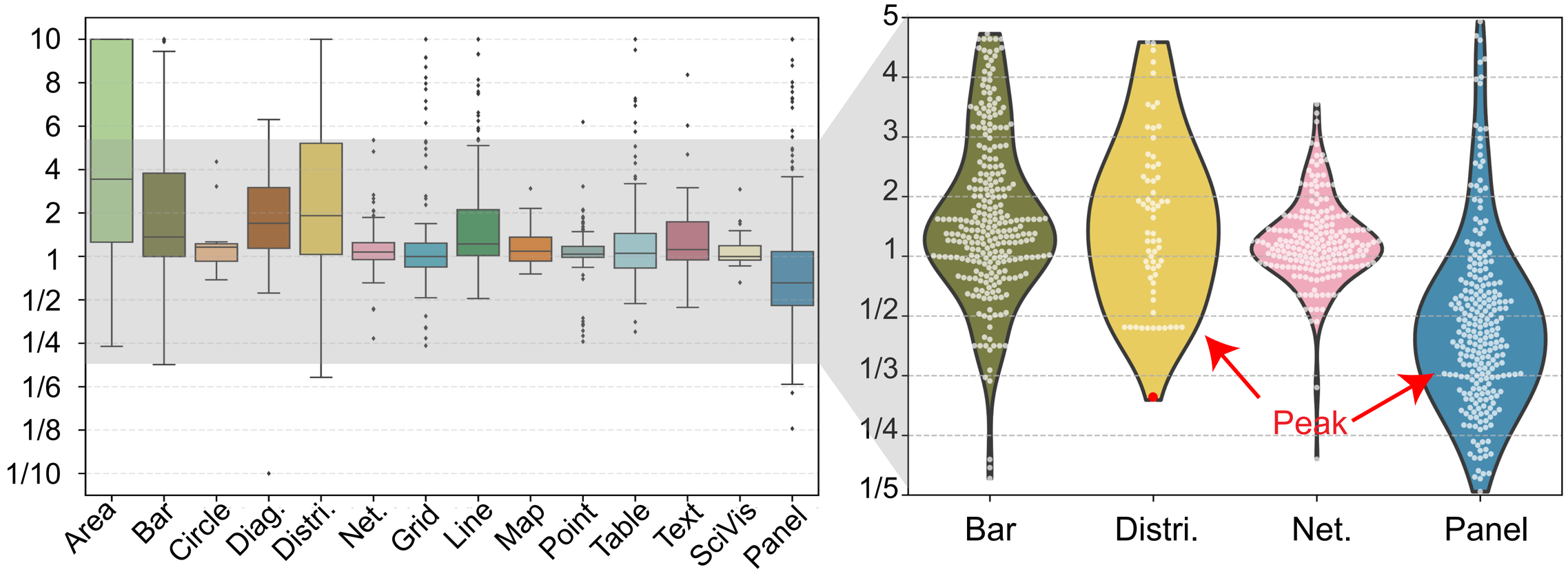
Frequency of View Count & Type





[Chen et al.]

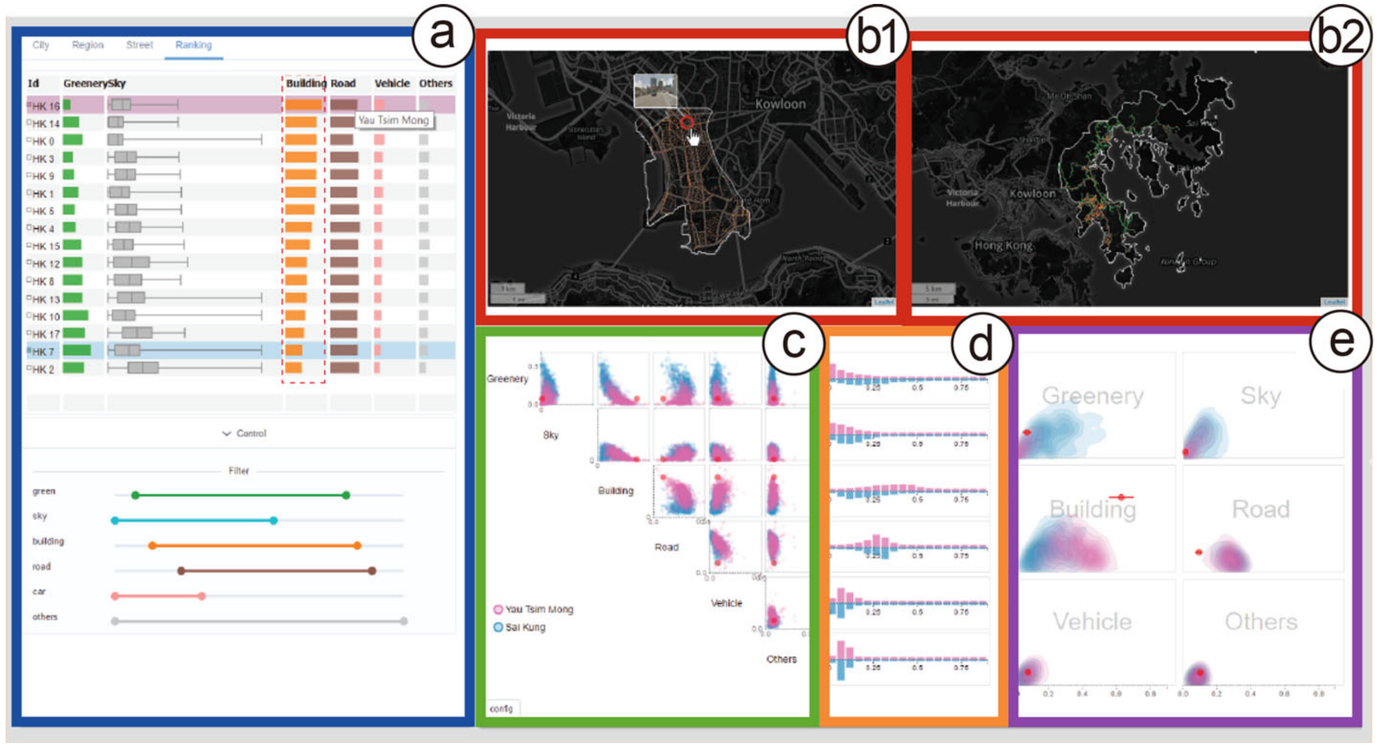
View Aspect Ratio Distribution



[Chen et al.]

Lingdan Shao · Zhe Chu · Xi Chen · Yanna Lin · Wei Zeng

Modeling layout design for multiple-view visualization via Bayesian inference



MV Design Factors

- View: Adopt Chen et al.'s Classification (Area Chart, Bar Chart, …)
- Coordination: Exploration, Focus+Context, Comparison
- Viewport: Only Desktop in this paper
- Designer: Creativity, Experience in MVs?

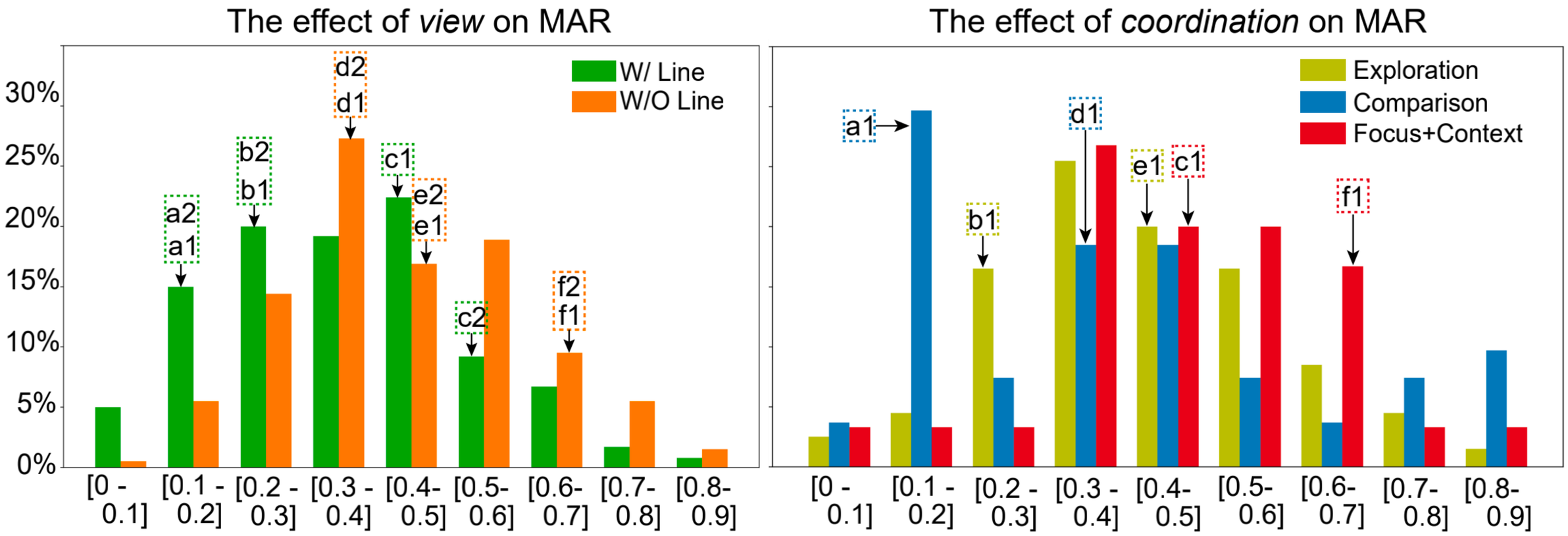
[L. Shao et al., 2021]

MV Layout Metrics

- Geometry:
  - Maximum Area Ratio (MAR): how much of one view dominates the visualization? allows identification of focus views
  - Weighted Average Aspect Ratio (WAAR): balanced in matrix arrangements or more diverse?
  - Topology: only horizontal, vertical, and hybrid

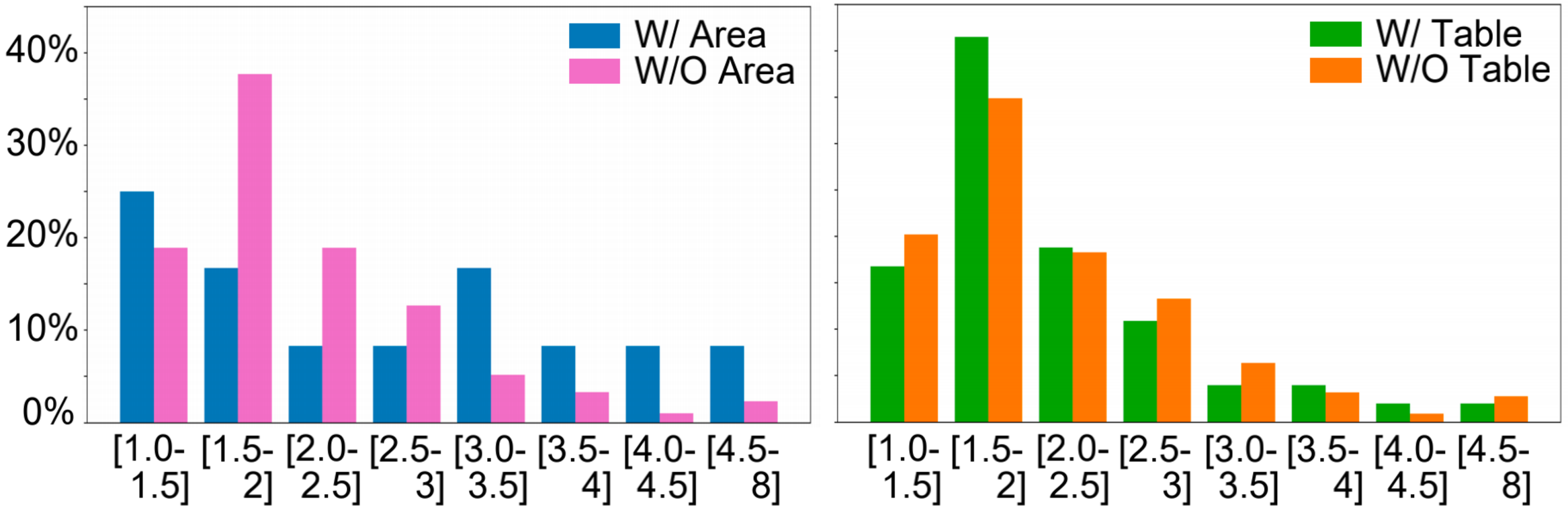
[L. Shao et al., 2021]

Effect on Maximum Area Ratio (MAR)



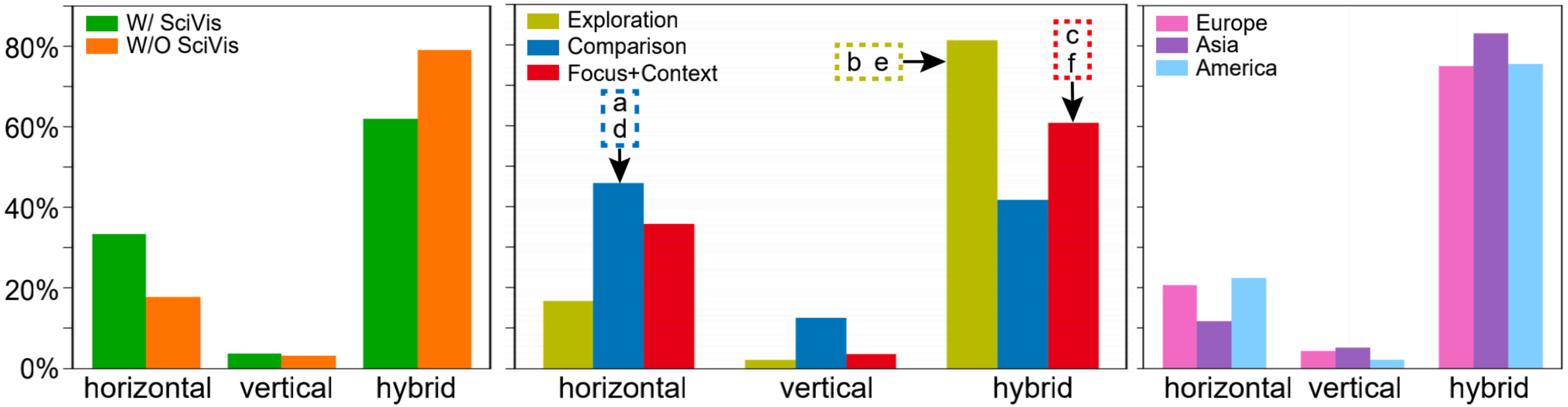
[L. Shao et al., 2021]

Effect on Weighted Average Aspect Ratio (WAAR)



[L. Shao et al., 2021]

Effect on Topology



[L. Shao et al., 2021]

Findings

- SciVis views have strong influence on topology (horizontal)
- Exploration and focus+context → hybrid
- Comparison → horizontal
- Designer has no significant impact (grouped by continent, however…)

[L. Shao et al., 2021]

MV Developer Options

- Developers can predetermine layout
- Views are positioned based on the data
- Group views that are coordinated together
- Screen size can be used to determine the layout
- Users can determine the layout

[Al-Maneea and Roberts]

Questions

- Do these surveys show how visualizations are being used?
- How much is an artifact of screen size or publication constraints?

Schedule

- Progress Reports Today
- Presentations after Thanksgiving
- Papers due at the end of the semester

Presentations

- Format: Conference Talk
  - Motivation and Introduction
  - Background & Related Work (short)
  - Technique/Methodology
  - Results
  - Conclusion
- Demos or videos are great, pre-record a video of a demo in case
  - Can be done early or later in presentation
- Motivation and results are aided by comparison with other work, that's a good way to point to related work

Presentation Schedule

- 2 on Tuesday
- 3 on Thursday (or vice versa)
- Volunteers?

Paper

- Research paper format (IEEE TVCG preferred)
- Due at the end of the semester

Progress Reports