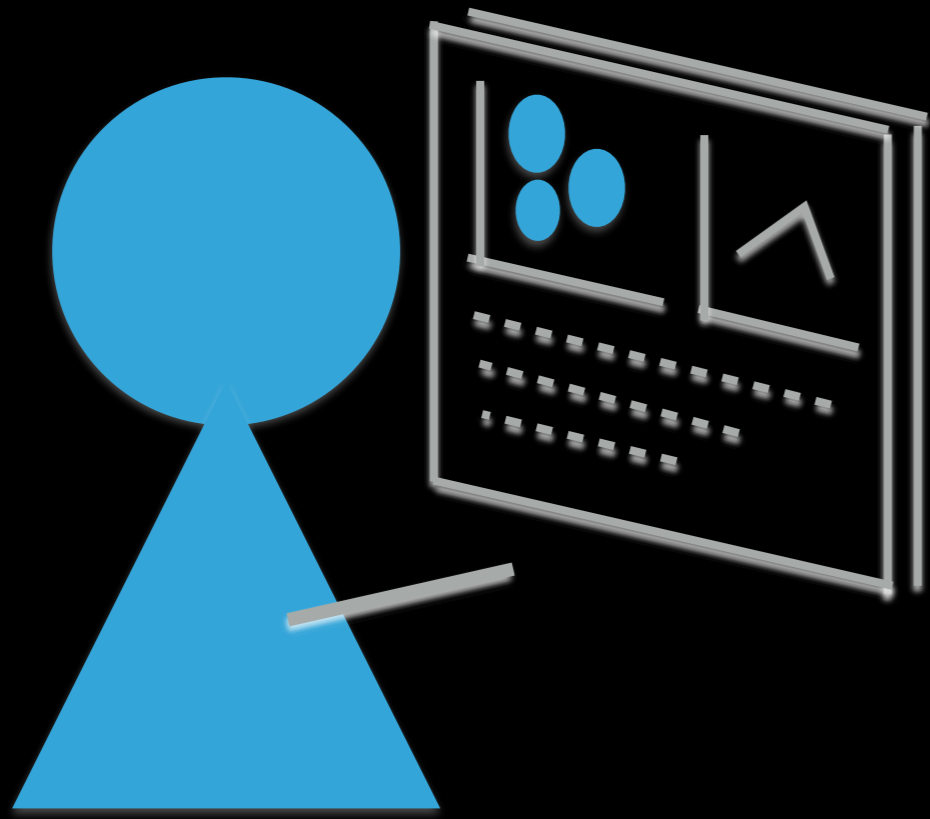
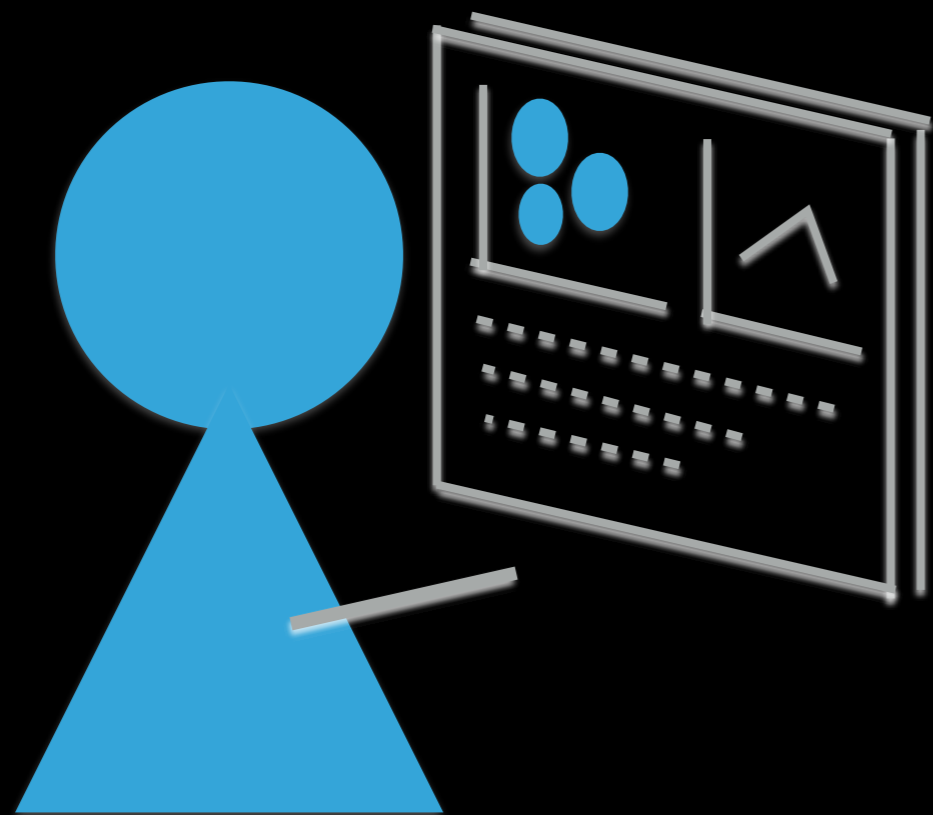


Requirements for Visual Interaction Analysis Systems

Yi Han, Gregory D. Abowd, John Stasko
Georgia Institute of Technology

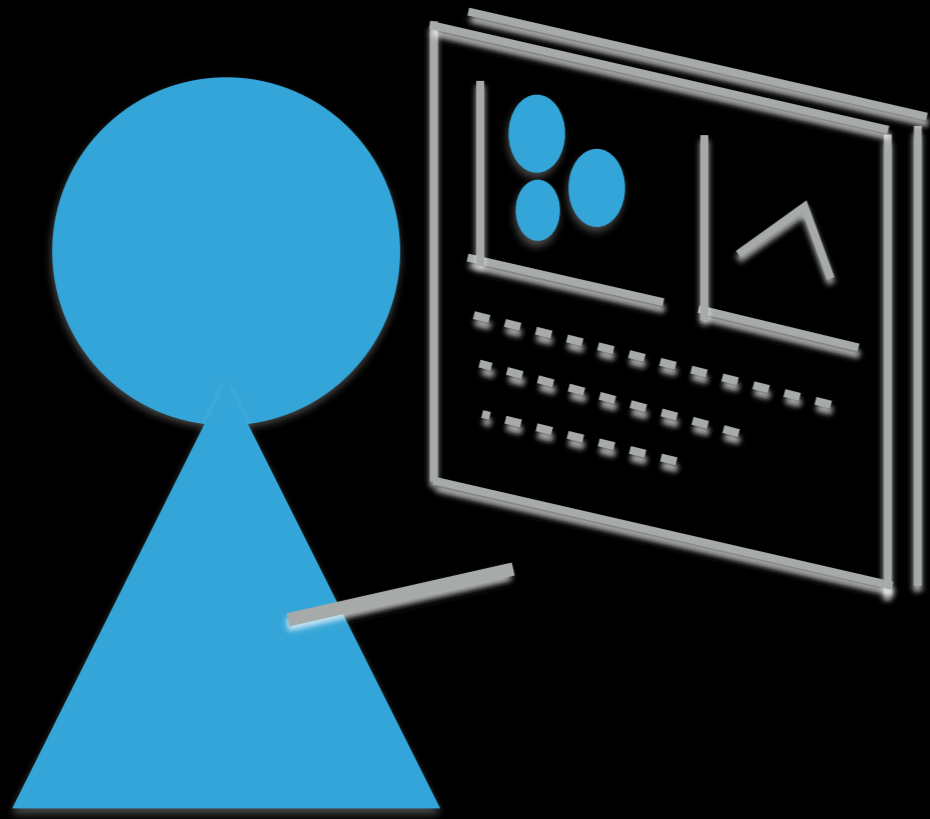


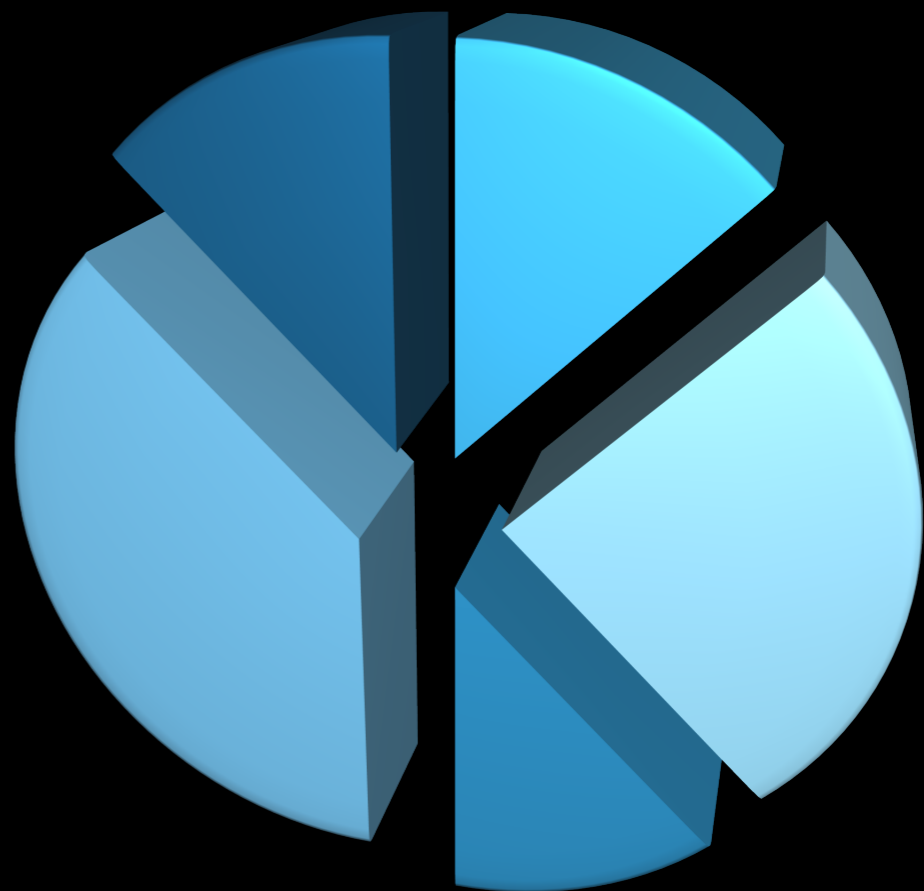
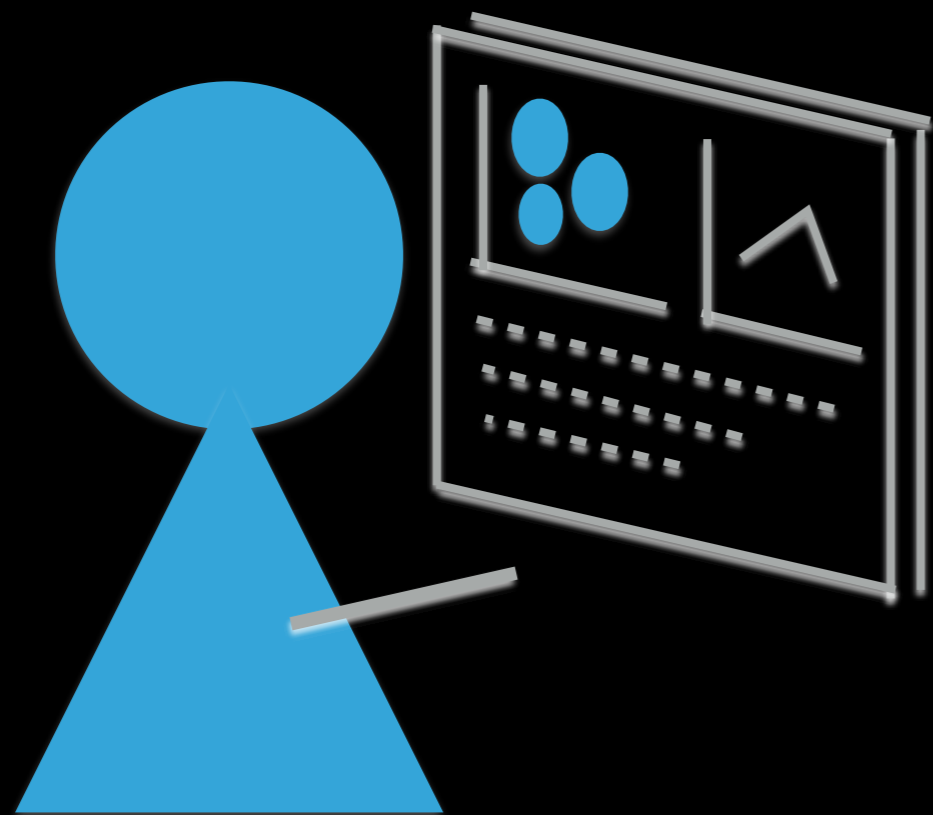




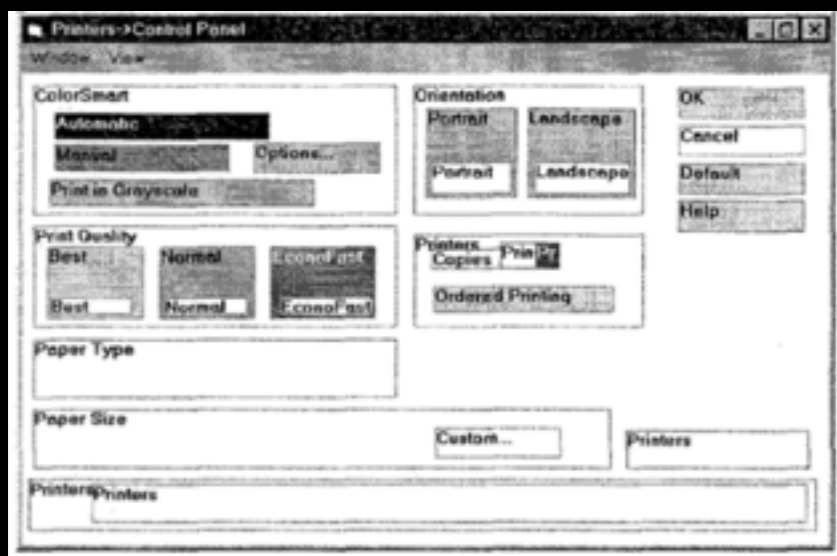
Add chart
Filter data
Zoom in
Pan left
Show details

...

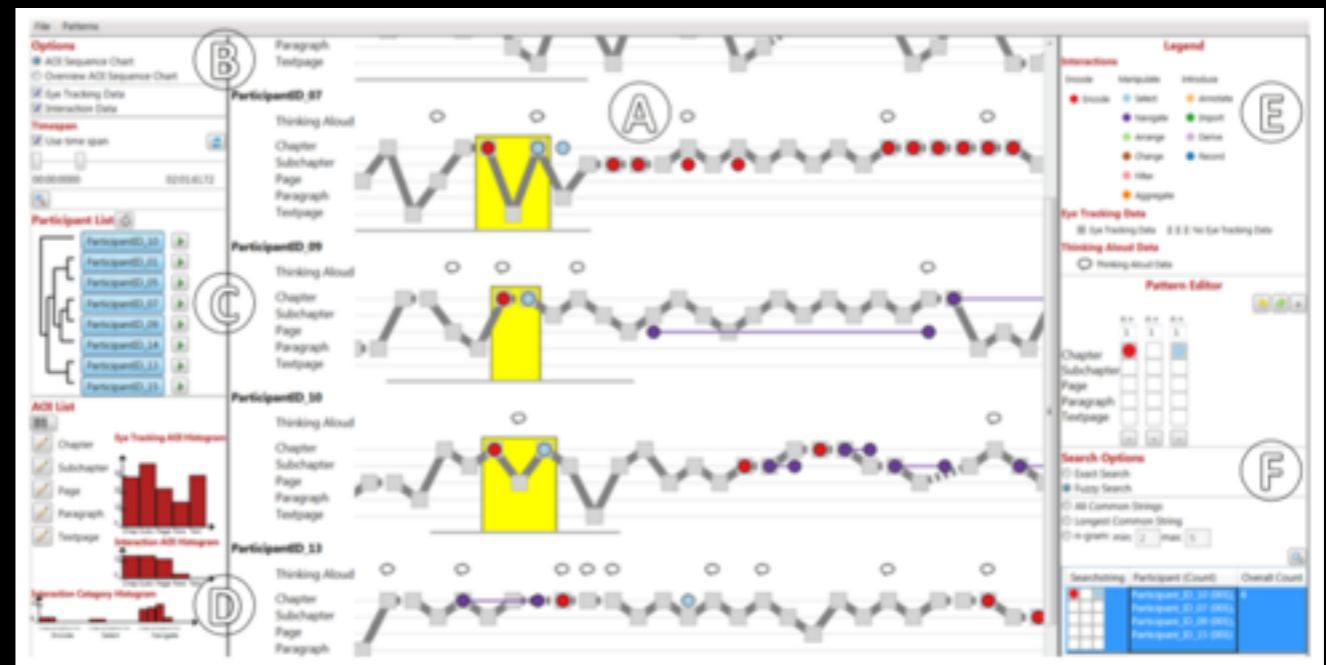




Visual Interaction Analysis



Gray et al., 1996



Blascheck et al., 2016



Jeong et al., 2008

Limitations

Limitations

- **Lack of Flexibility**
 - Single set of categories (e.g., encode, select,...)

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Limitations

- **Lack of Flexibility**
 - Single set of categories (e.g., encode, select,...)
- **Insufficient Scalability**
 - Small scale interaction dataset
- **Limited Generalizability**
 - Applicable only to a specific interaction dataset

Requirements

Flexibility

Single set of categories

Scalability

Less scalable techniques

Generalizability

Specific interactions

Requirements

Flexibility

Single set of categories

⋮

?

Scalability

Less scalable techniques

⋮

?

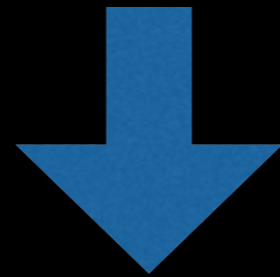
Generalizability

Specific interactions

⋮

?

Tasks



Requirements

Flexibility

Single set of categories

⋮

?

Scalability

Less scalable techniques

⋮

?

Generalizability

Specific interactions

⋮

?

Interaction Analysis Tasks

Interaction Analysis Tasks

- **Assess Usability**
 - Ease of use and learning
 - e.g., Random ► Consistent patterns

Interaction Analysis Tasks

- **Assess Usability**

- Ease of use and learning
- e.g., Random ➤ Consistent patterns

- **Assess Utility**

- Find insights
- e.g., Bookmark (Visual Insight Action, Gotz and Zhou, '08)

Interaction Analysis Tasks

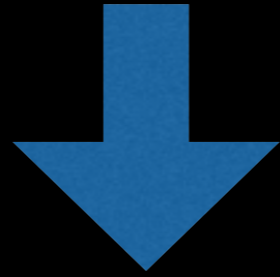
Interaction Analysis Tasks

- **Learn About Users**
 - e.g., Novice and Expert Users

Interaction Analysis Tasks

- **Learn About Users**
 - e.g., Novice and Expert Users
- **Understand Usage Patterns/Analysis Methods**
 - e.g., Visual Information-seeking Mantra
 - “Overview first, zoom and filter, then details on demand.”
(Shneiderman, '96)

Tasks



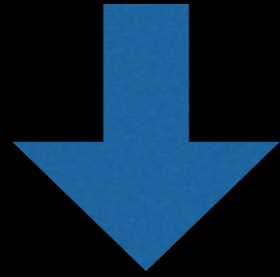
Requirements

Flexibility

Scalability

Generalizability

Tasks



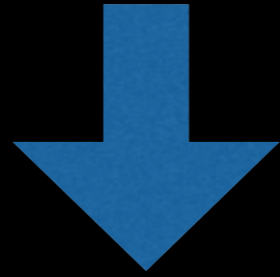
Requirements

Flexibility

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Generalizability

Tasks



Requirements

Flexibility

Scalability

Generalizability

Select Events

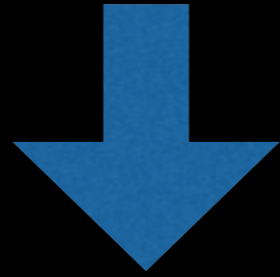
Click Zoom In

Click Zoom Out

Select Item

Remove Item

Tasks



Requirements

Flexibility

Scalability

Generalizability

Select Events

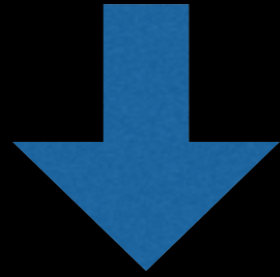
Click Zoom In

Click Zoom Out

Select Item

Remove Item

Tasks



Requirements

Flexibility

Scalability

Generalizability

Define Categories

Zoom

Zoom

Filter

Select Events

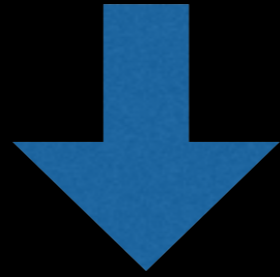
Click Zoom In

Click Zoom Out

Select Item

Remove Item

Tasks



Requirements

Flexibility

Scalability

Generalizability

Extract Sequences

Zoom and Filter

Define Categories

Zoom

Zoom

Filter

Select Events

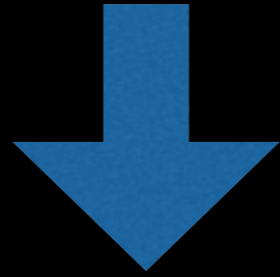
Click Zoom In

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Select Item

Remove Item

Tasks



Requirements

Flexibility

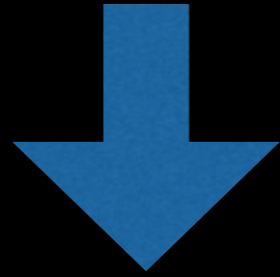
Scalability

Generalizability



Configurable Visualization

Tasks



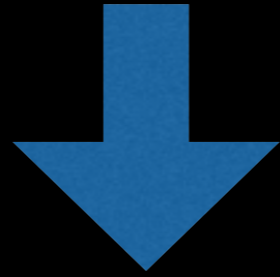
Requirements

Flexibility

Scalability

Generalizability

Tasks



Requirements

Flexibility

Scalability

Generalizability

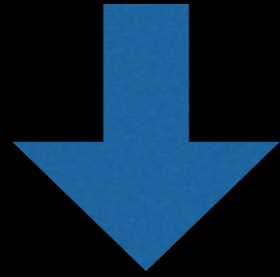
Zoom and Filter

Zoom and Filter



Zoom and Filter

Tasks



Requirements

Flexibility

Scalability

Generalizability

Zoom and Filter

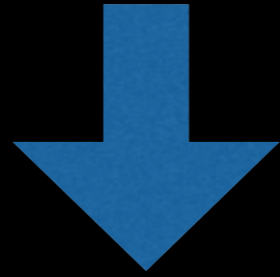
Zoom and Filter



Zoom and Filter

Sequential Pattern Mining

Tasks



Requirements

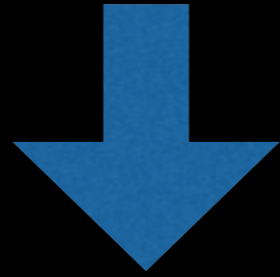
Flexibility

Scalability

Generalizability

Automated Computational Assistance

Tasks



Requirements

Flexibility

Scalability

Generalizability

Applicable to Any Visualization Applications

Requirements

- **Flexibility**
 - Support Event Organization
 - Provide Configurable Visualizations
- **Scalability**
 - Include Automated Computational Assistance
- **Generalizability**
 - Apply to Any Visualization Application

Visual Interaction Analysis System

Demo at the Event Event workshop (4:15 pm) tomorrow



Thank you

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yihan@gatech.edu