CPSC 533C: Interaction

by

Jordan Lee

08 Mar 04
Papers Reviewed


- **Worlds within Worlds: Metaphors for Exploring N-Dimensional Virtual Worlds**, Steven Feiner and Carl Beshers. UIST 1990, pp 76-83

- **Two-handed Interactive Stereoscopic Visualization**, David S. Ebert, Christopher D. Shaw, Amen Zwa and Cindy Starr. IEEE Vis 1996.
High Interaction Graphics

- Interactivity allows
  - Clarity
Clarity Example

Interactive vs. Static

Effect of Fat on Calories
High Interaction Graphics

• Interactivity allows
  – Clarity
  – Robustness
Robustness Example

Interactive Vs. Static
High Interaction Graphics

• Interactivity allows
  – Clarity
  – Robustness
  – Power
Power Example

Districts of the city of Dublin showing areas with high levels of average income.
High Interaction Graphics

- Interactivity allows
  - Clarity
  - Robustness
  - Power
  - Possibility
Possibility Example

Multiple Views
High Interaction Graphics

- Interactive data types
  - Lists
    - Colour code selected items in other plots
High Interaction Graphics

- Interactive data types
  - Lists
    - Colour code selected items in other plots
  - Histograms
    - Colour portion of histogram selected
Histogram Example

(a)

(b)

(c)
High Interaction Graphics

• Interactive data types
  – Lists
    • Colour code selected items in other plots
  – Histograms
    • Colour portion of histogram selected
  – Boxplots
    • Like histogram but shows more information in less space
    • Colour portion of boxplot selected
Boxplot Example
High Interaction Graphics

- Interactive data types
  - Lists
    - Colour code selected items in other plots
  - Histograms
    - Colour portion of histogram selected
  - Boxplots
    - Like histogram but shows more information in less space
    - Colour portion of boxplot selected
  - Scatterplot matrices
    - Allow multi-dimensional variables
    - Select in one cell, highlight in all other cells of matrix
## Scatterplot Matrix Example

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<th>Zambia</th>
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Critique

• Pros
  – Good reference paper for generating interactive data types
  – Well structured, easy to read and understand
Worlds within worlds

- Tool for financial visualization
  - Multidimensional analysis (7-space)
Worlds within worlds

- Tool for financial visualization
  - Multidimensional analysis (7-space)
- Data glove
  - 16 DOF
  - allows “grab” vs “steer”
Worlds within worlds

- Tool for financial visualization
  - Multidimensional analysis (7-space)
- Data glove
  - 16 DOF
  - allows “grab” vs “steer”
- Stereoscopic glasses
  - Reduces 3D ambiguity
  - Aids positioning in 3D
Worlds within worlds

- “world”
  - Definition: 3D graph with embedded worlds
  - Each level reduces complexity by 3 dimensions
Worlds within worlds

- “world”
  - Definition: 3D graph with embedded worlds
  - Each level reduces complexity by 3 dimensions

- Metamorphosis
Critique

• Pros
  – Good implementation details
Critique

• Pros
  – Good implementation details

• Cons
  – No user feedback
  – No comparison to alternate or past methods
  – No discussion of scalability or real-time manipulation
Two-handed Interactive...
Two-handed Interactive...

- Too to navigate and investigate 3D space
  - Eg 3D scatterplots
Two-handed Interactive...

- Minimally-immersive interaction
Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
  - Non-dominant hand
Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
  - Non-dominant hand
    - Manipulate position and orientation of the scene
    - Select drawing context from menus
Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
  - Non-dominant hand
    - Manipulate position and orientation of the scene
    - Select drawing context from menus
  - Dominant hand
Two-handed Interactive...

• Minimally-immersive interaction
• 3d magnetic trackers
  – Non-dominant hand
    • Manipulate position and orientation of the scene
    • Select drawing context from menus
  – Dominant hand
    • Select 3d volume subset
    • Pick glyphs to display information
Critique

• Pros
  – Described past iteration of software
  – Good efficiency analysis and breakdown of optimizations
  – Actual rendering benchmarks and limits
Critique

• Pros
  – Described past iteration of software
  – Good efficiency analysis and breakdown of optimizations
  – Actual rendering benchmarks and limits

• Cons
  – Few implementation details