

CPSC 533C: Interaction

by
Jordan Lee
08 Mar 04

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Papers Reviewed

- [High interaction graphics](#), Stephen G. Eick and Graham J. Wills. European Journal of Operational Research, 81:445-459, 1995.
- [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.

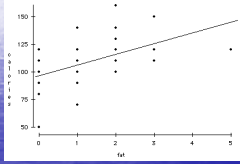
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High Interaction Graphics

- Interactivity allows
 - Clarity

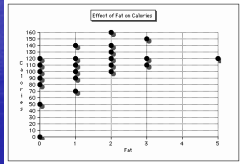
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Clarity Example



Interactive

Vs.



Static

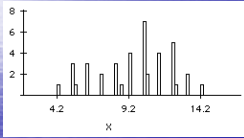
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High Interaction Graphics

- Interactivity allows
 - Clarity
 - Robustness

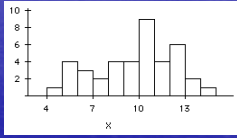
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Robustness Example



Interactive

Vs.



Static

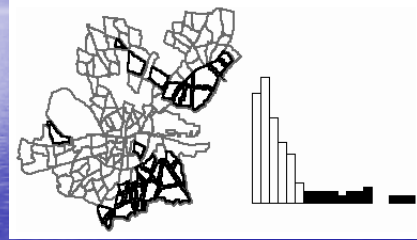
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High Interaction Graphics

- Interactivity allows
 - Clarity
 - Robustness
 - **Power**

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Power Example



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

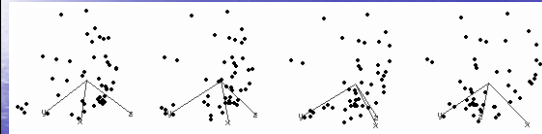
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High Interaction Graphics

- Interactivity allows
 - Clarity
 - Robustness
 - Power
 - **Possibility**

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Possibility Example



Multiple Views

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High Interaction Graphics

- Interactive data types
 - **Lists**
 - Colour code selected items in other plots

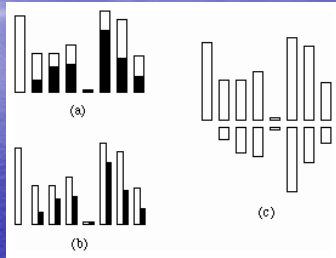
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High Interaction Graphics

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

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Histogram Example



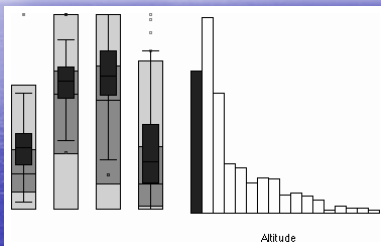
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High Interaction Graphics

- 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

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Boxplot Example



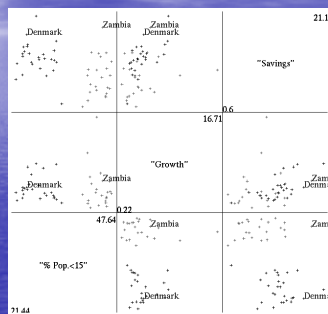
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High Interaction Graphics

- 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

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Scatterplot Matrix Example



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Critique

- Pros
 - Good reference paper for generating interactive data types
 - Well structured, easy to read and understand

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Worlds within worlds

- Tool for financial visualization
 - Multidimensional analysis (7-space)

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Worlds within worlds

- Tool for financial visualization
 - Multidimensional analysis (7-space)
- Data glove
 - 16 DOF
 - allows "grab" vs "steer"

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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

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Worlds within worlds

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

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Worlds within worlds

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

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Critique

- Pros
 - Good implementation details

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Critique

- Pros
 - Good implementation details
- Cons
 - No user feedback
 - No comparison to alternate or past methods
 - No discussion of scalability or real-time manipulation

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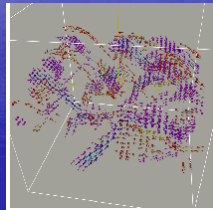
Two-handed Interactive...



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Two-handed Interactive...

- Too to navigate and investigate 3D space
 - Eg 3D scatterplots



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Two-handed Interactive...

- Minimally-immersive interaction

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Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers

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Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
 - Non-dominant hand

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Two-handed Interactive...

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

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Two-handed Interactive...

- Minimally-immersive interaction
- 3d magnetic trackers
 - Non-dominant hand
 - Manipulate position and orientation of the scene
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 - Dominant hand

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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

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Critique

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

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Critique

- Pros
 - Described past iteration of software
 - Good efficiency analysis and breakdown of optimizations
 - Actual rendering benchmarks and limits
- Cons
 - Few implementation details

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