VISUALIZATIONS ON TABLETOPS

CPSC 533C
Jen Fernquist

Papers

- EMDialog: Bringing Information Visualization into the Museum *Uta Hinrichs, Holly Schmidt, Sheelagh Carpendale*
- Visualizing Biodiversity with Voronoi Treemaps *Michael S. Horn, Matthew Tobiasz, Chia Shen*
- Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections *Petra Isenberg, Danyel Fisher*

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EMDialog: Bringing Information Visualization into the Museum

- **Goal:** Info vis for museums
  - Display in Emily Carr exhibit in Calgary

- Display Considerations:
  - Appeal – *motivation to approach*
  - Data – *dependent on exhibition content*
  - Highly intuitive interaction – *users aren't experts*
  - Engaging data representation – *short time span*

EMDialog: Bringing Information Visualization into the Museum

- Appeal

EMDialog: Bringing Information Visualization into the Museum

- Data for 2 Vis Components
  1. Primary data set – they compiled 103 written statements about Emily Carr, 71 pictures of paintings
  2. Tree frameworks – they derived 6 keyword tree maps to provide context for statements/pictures

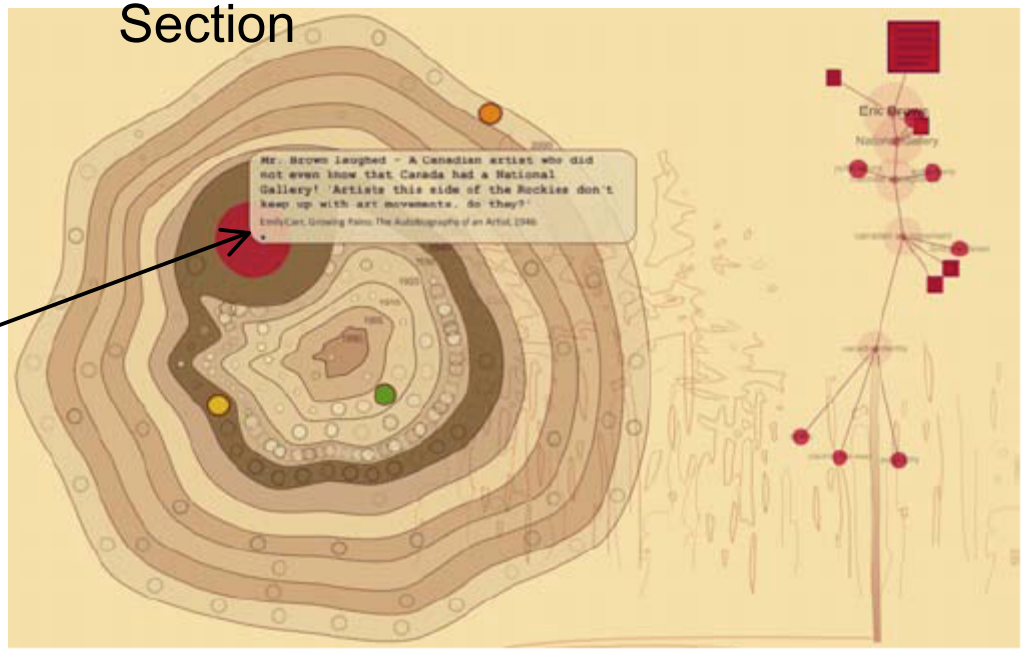
EMDialog: Bringing Information Visualization into the Museum

- Highly Intuitive Interaction / Data Representation

1. Cut Section

2. Tree Map

written statement



EMDialog: Bringing Information Visualization into the Museum

- Resulting System
  - *<video>*

EMDialog: Bringing Information Visualization into the Museum

- Evaluation
  - Ethnographic observation
  - 267 interactions observed (1 person watched 2-4hrs, 15 days)
  - 87 questionnaires
- Results
  - Interaction time: <2 mins (30%) or 2-5mins (avg)
  - Cut section vis dominated; familiar button-like dots
  - Interactions primarily touch-and-release, “which worked but in a rather inaccurate and dissatisfying way”
    - They intended people to run their fingers through the vis
  - Mixed response

EMDialog: Bringing Information Visualization into the Museum

- Critique
  - Bad
    - Projection hindered more than helped
    - Un-intuitive interaction – solved with a pilot study?
    - Didn't design to be multi-user! People visit museums in groups
      - People came up with their own ways to make it multi-user
    - They intended it to be walk-up-and-use but many people couldn't (some looked for instructions)
    - Easy to get lost in tree animation
  - Good
    - Pretty!

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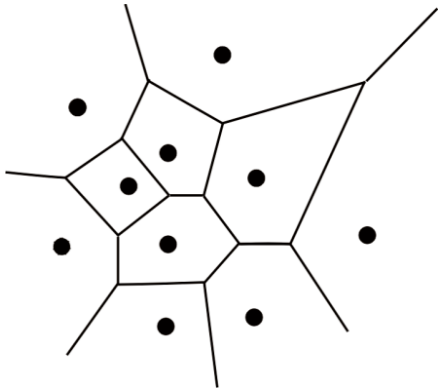
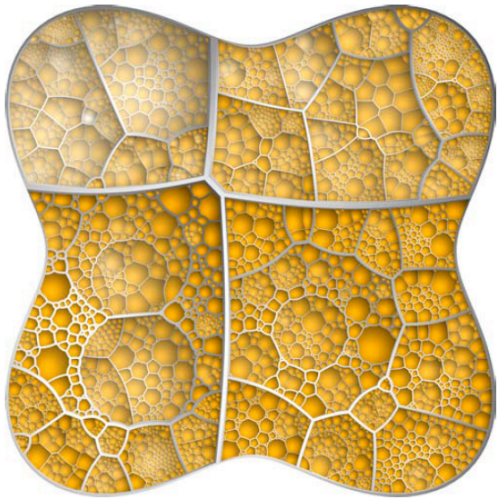
Visualizing Biodiversity with Voronoi Treemaps

- Defn: Voronoi Diagram



- Defn: Voronoi Treemaps
  - Treemaps that allow cells of arbitrary shape
  - Treemaps can also be contained *within* an arbitrary shape

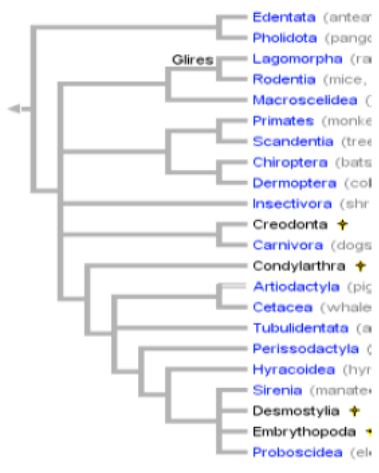


M. Balzer and O. Duessen. "Voronoi Treemaps." InfoVis 2005

Visualizing Biodiversity with Voronoi Treemaps

- **Goal:** create an multi-user interactive vis for the Encyclopedia of Life (EoL)
  - EoL has 1.2M entries of species names/descriptions
  - EoL organizes species using 9-level taxonomy
- Avoid indentation-style lists more appropriate for single us

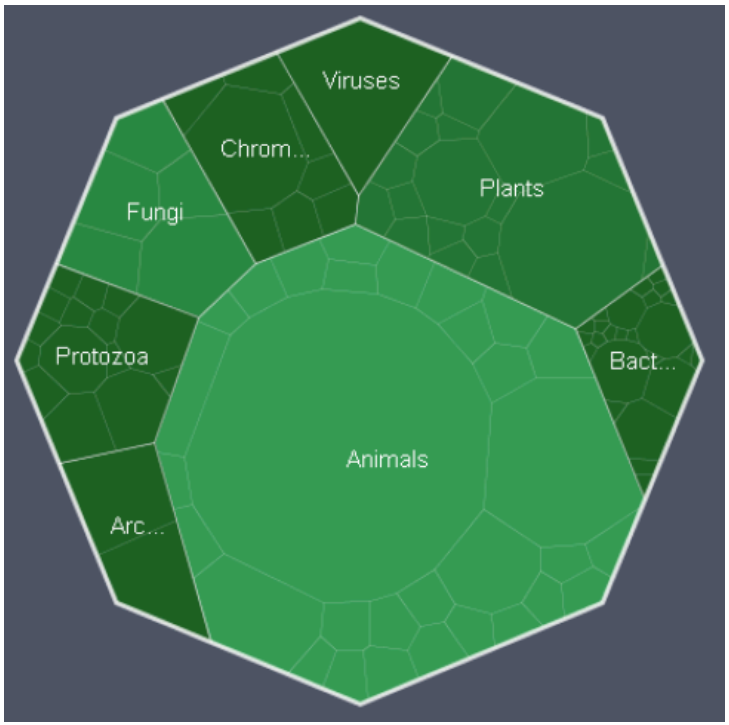
EoL



Tree of Life

Visualizing Biodiversity with Voronoi Treemaps

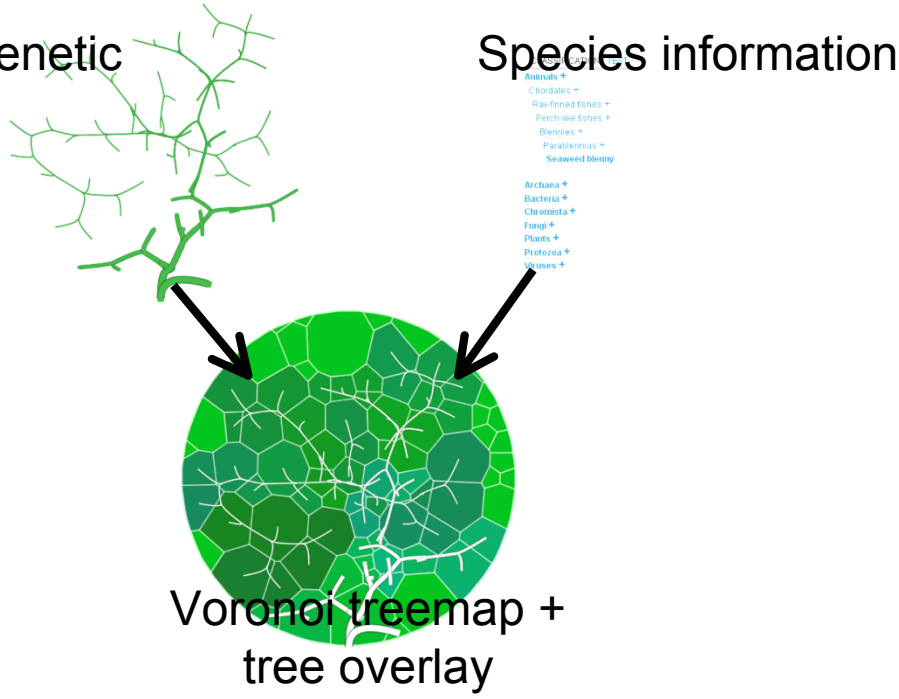
- Voronoi Treemap
  - Region sizes are relative to number of species within that section of taxonomy



Visualizing Biodiversity with Voronoi Treemaps

- Phylogenetic Trees (from ToL)
  - Phylogenetic trees show evolutionary relationships
  - Group regions spatially based on relatedness

ALGORITHM:



Visualizing Biodiversity with Voronoi Treemaps

- Resulting System
  - *<video>*

Visualizing Biodiversity with Voronoi Treemaps

- Critique
  - Good
    - Continually iterative development
    - Use of Voronoi treemaps for multi-user interaction
    - Main vis can be rotated
    - Animation during transitions
    - ‘Back’ button at opposite ends of table
  - Bad
    - Media component and Back buttons have 1 orientation
    - No other indication of current tree level – lack context
    - No indication of path followed
    - More colour use?

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Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- **Goal:** create a visual analytics tool to support individual and collaborative information foraging

- Defn: Collaborative brushing and linking:

  "An awareness technique in which the interactions of one collaborator on a visualization are visible to other collaborators viewing the data items in their own visualizations or view of the data."

Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Data and Tasks
  - Task – 2 users search through a document collection to understand an outbreak of BSE (mad cow disease), see if it's linked to corruption in city hall
  - Data – 1200 fictitious newspaper articles from VAST 2006 contest

Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- 4 Questions Guiding Design
  -  Did another search also find my document?
  -  Has someone else issued my search?
  -  Has someone considered the same document?
  -  Has someone read the same document?

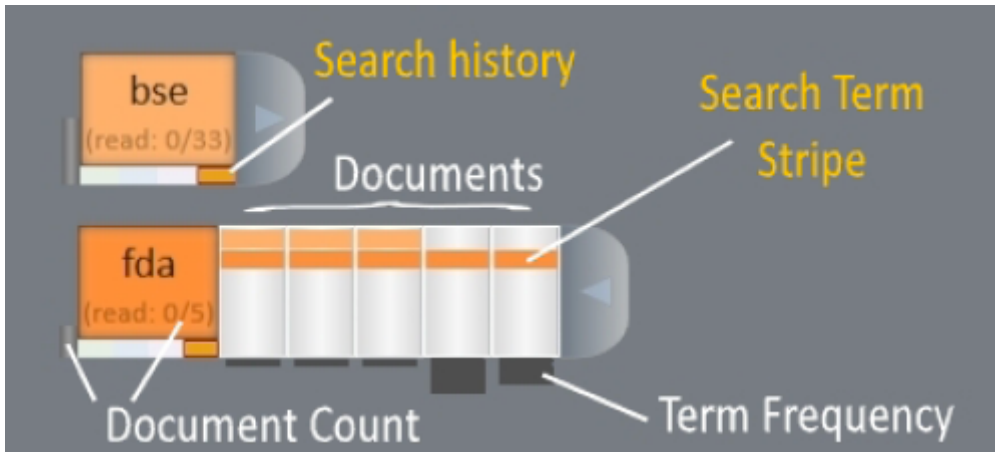
- Motivation
  - Work independently; collaborate if there's something in common
  - Prevent redundancy

Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Interaction Starts with a Search

Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

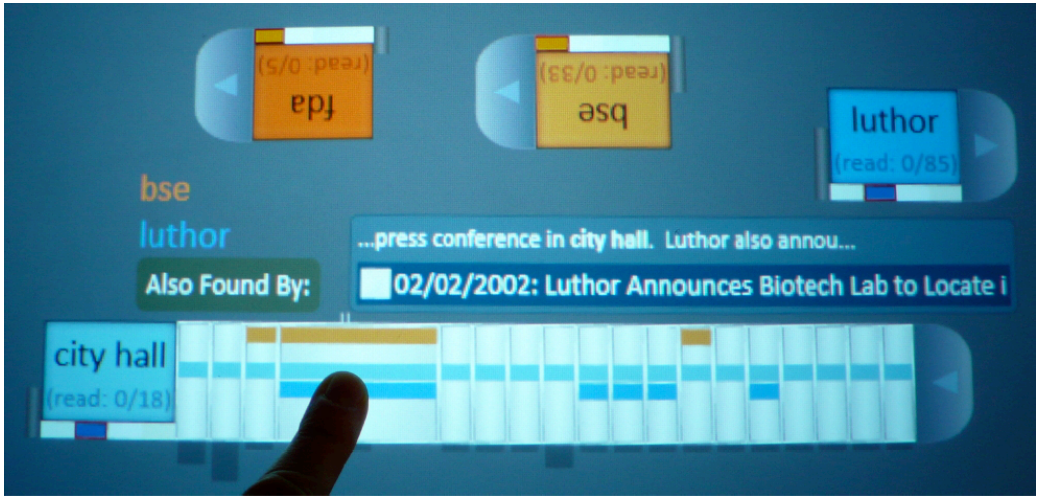
- Presenting Search Results



- Palette of colours per user: each gets one hue

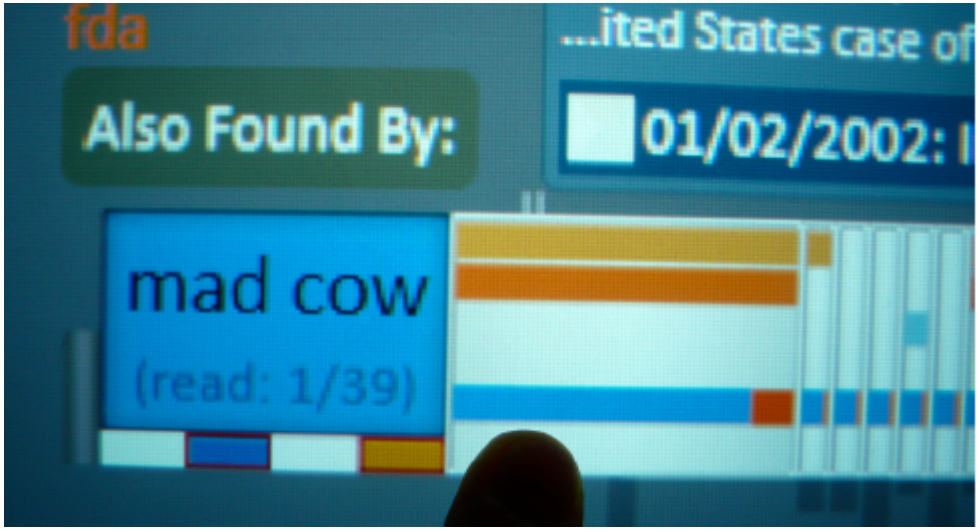
Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Did another search also find my document?



Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Has someone else issued my search?

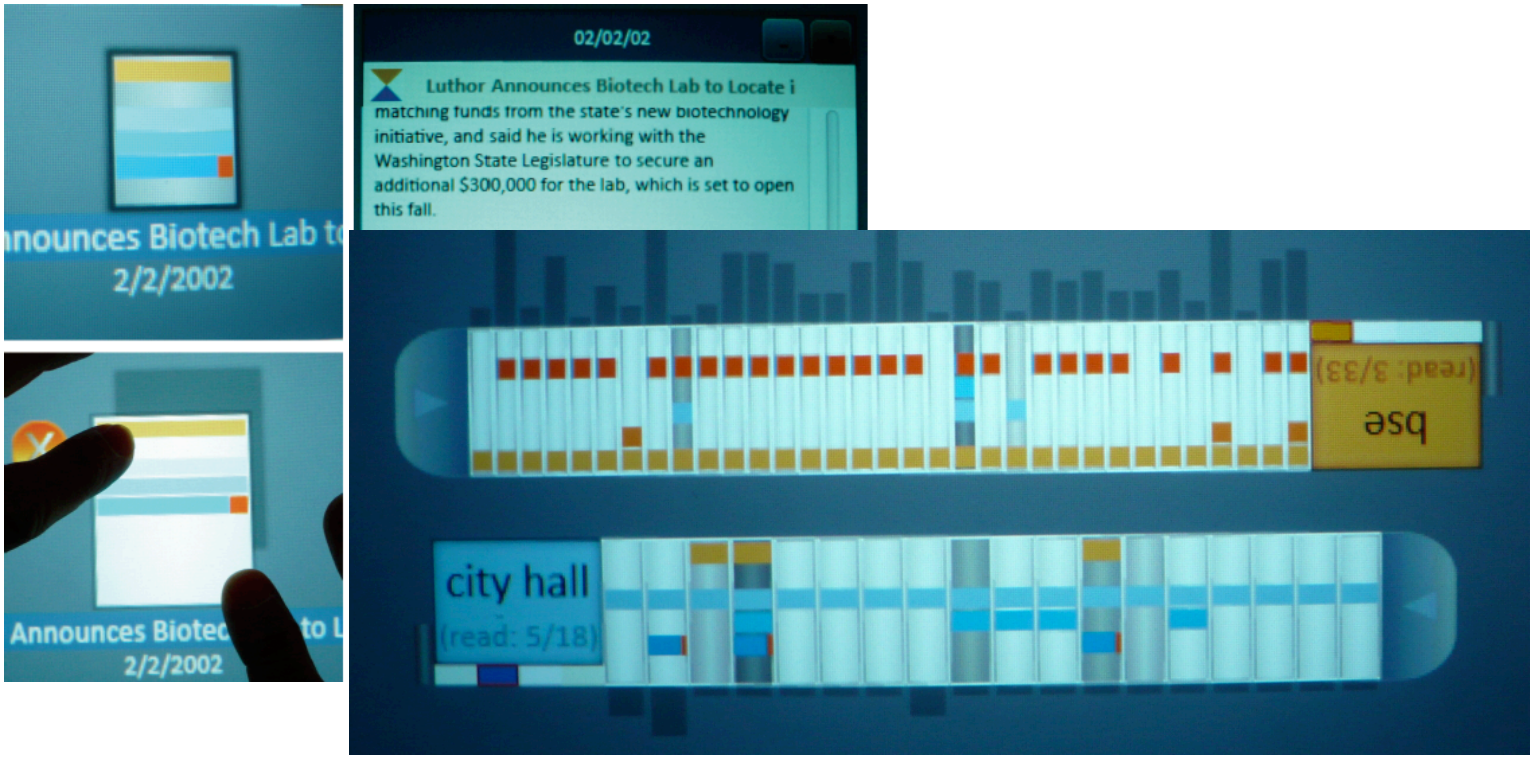


Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Has someone considered the same document?

Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Has someone read the same document?



Collaborative Brushing and Linking for Co-located Visual Analytics of Document Collections

- Initial Eval & Critique
  - Good
    - Substantial emphasis on collaboration
    - Good interaction after 15mins training
    - Good multi-touch support
  - Bad
    - Results show users mostly worked by themselves, in silence (though monitored other participant)
    - Scalability, e.g. if a user performs >6 searches

QUESTIONS?

Thanks!