

# Social Visualization



CS 7450 - Information Visualization  
November 19, 2012  
John Stasko

## Casual InfoVis

### Recap



- User population
  - Everyday people
- Usage pattern
  - Momentary, repeatable, contemplative
- Data type
  - Often personal and relevant
- Insight
  - Not analytical

## Casual InfoVis Subareas



- Artistic InfoVis
- Ambient InfoVis
- Social InfoVis - today

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## Definition



- Social Visualization
  - “Visualization *of* social information *for* social purposes”  
---Judith Donath, MIT
  - Visualizing data that concerns people or is somehow people-centered

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# Social Visualization



- “Unlike information visualization which has as its goal of helping users digest information more effectively or data visualization which has as its goal of helping users analyze and see trends in the data, **social visualization** has as its goal of creating **awareness and catalyzing social interactions among its users.**”  
(Alison Lee)

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# Example Domains



- Social visualization might depict
    - Conversations
    - Newsgroup activities
    - Email patterns
    - Chat room activities
    - Presence at specific locations
    - Social networks
    - Life histories
- Can you think of others?

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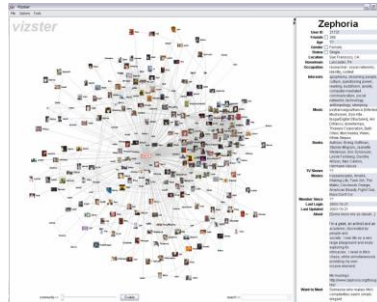
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## Projects



- We've seen projects from this area already this term



Vizster  
(Graph & Networks day)

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## Activity



- Social Media Group at MIT Media Lab, directed by Judith Donath, was an early focus for this kind of work
  - <http://smg.media.mit.edu>
- Social Spaces Group at Illinois, directed by Karrie Karahalios, also works on social visualization
  - <http://social.cs.uiuc.edu>

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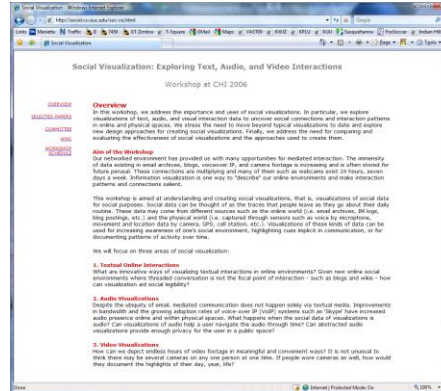
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# Workshop

<http://social.cs.uiuc.edu/soc-viz.html>



- 2006 CHI Conference had a workshop on the topic



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# SMG Projects



- Let's examine a few projects from the SMG group
  - Visual Who
  - ChatCircles
  - Loom
  - Web Fan
  - PeopleGarden
  - ...

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## Visual Who



- Background
  - Make social patterns of an electronic community visible
  - Patterns of Association
  - Patterns of Presence
  - Spring-based

Donath  
Multimedia'95

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## Objectives



- Try to show
  - busy-ness
  - affinities
  - arrivals
  - who's around
  - ...
- Utilize one main visualization technique

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# Data Gathering



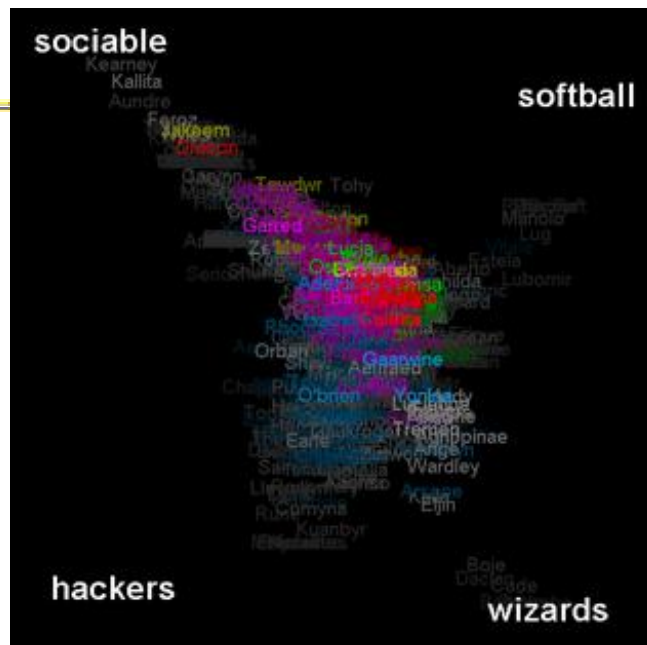
- Uses mail list file, as well as data about logins and idle times
  - From utmp entries

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Appearance



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## Technique



- Present people's names and different group names (lists)
- Uses spring model
- User can move group names around on display and the position of people updates to reflect their affinity to different groups

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## Algorithm



- Start with everyone in center
- Move lists around, update positions
- Color represents groups, brightness is relative strength of item with respect to groups it's near

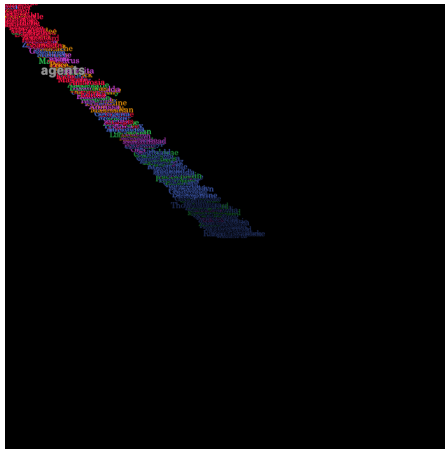
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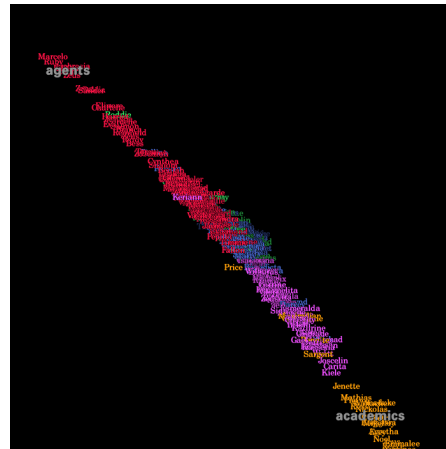


# Example Use



One anchor

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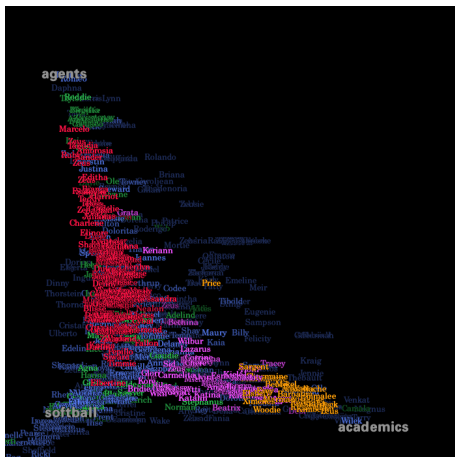


Add a second anchor

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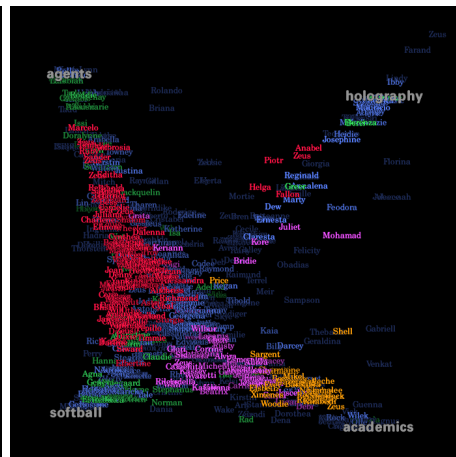
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# Example Use (contd)



Add third anchor

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Add fourth anchor

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## Presence Information



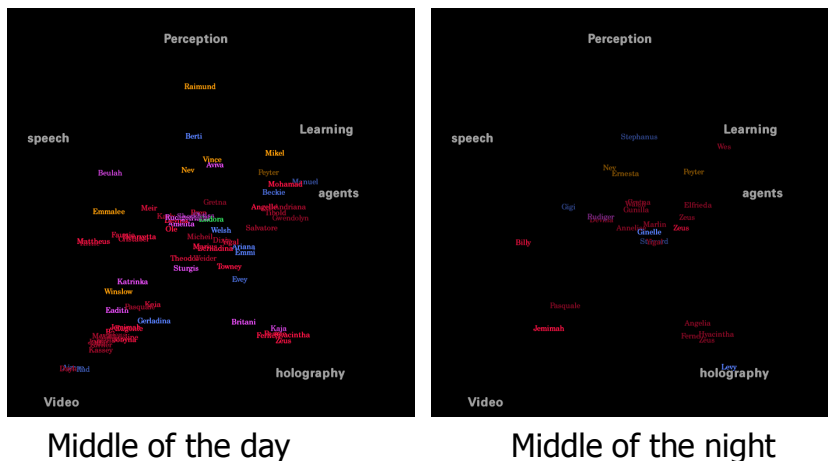
- In another mode, only people who meet some condition would be displayed
  - Condition could be “are currently logged on”
  - Would show presence data

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## Visualizing Presence



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## Potential Issues



- Motion only occurs during anchor placement
- Unix-based only (data from utmp)
- Privacy concerns
- Display is fundamentally “noisy” (Can you really differentiate that much?)

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## Discussion Groups



- Web-based message boards
  - Usenet newsgroups
  - Chatrooms
- Blast from the past**
- All once pervasive, not so much now
  - Can we create a relatively general tool to show activity at such places?

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## Common Questions



- Do participants really get involved?
- How much interaction is there?
- Do participants welcome newcomers?
- Who are the experts?
  
- Provide a visualization tool that helps to answer these questions
  - Show patterns, rates, interactions

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## Chat Circles



- GUI for chat rooms
- Makes each person's presence more clear
- Can more clearly see different conversations going on
- Mimics cocktail party in certain ways

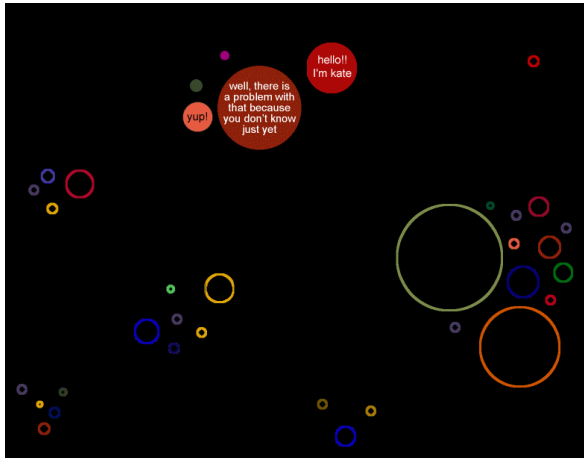
Viegas and Donath  
CHI '99

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# Interface



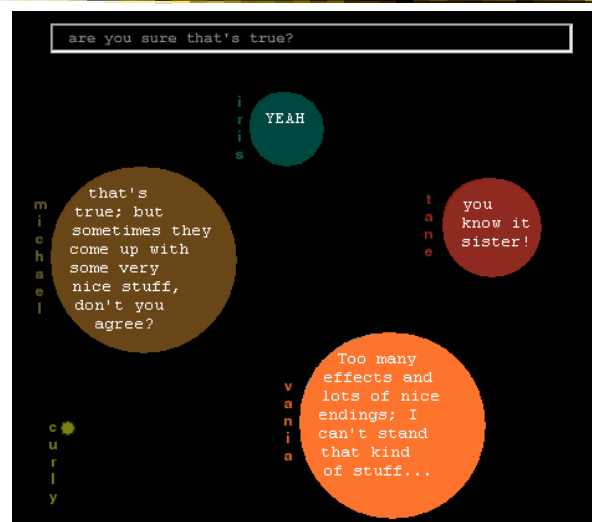
- Each person is a colored circle
- Circle grows with each posted message, slowly shrinks/fades as goes idle
- Will stay there as small circle while connected
- Comments appear inside circles
- Can only "hear" what is going on nearby

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# Conversational Interface

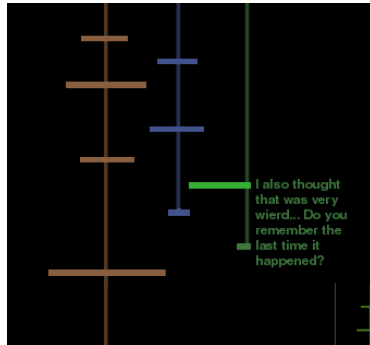


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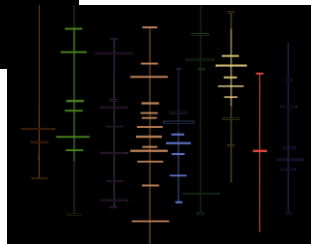
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## History Interface



- Individual users on x-axis
- Time goes up on y-axis
- Tick marks are postings, mouse over reveals them
- Solid tick marks were within earshot of you, hollow ones weren't



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## Potential Issues



- Long sentences hard to display (negligible?)
- Text only (no avatars)
- Real-estate intensive

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# Loom



- A tool for visualizing newsgroups
- Patterns of key events in a newsgroup
  - Entry and exit of participants
  - Birth and death of a thread
  - Tone of messages
  - “Path traversed by users as they create this social fabric”

Donath, Karahalios, and Veigas  
HICSS '99

<http://www.media.mit.edu/~kkaarahal/loom/>

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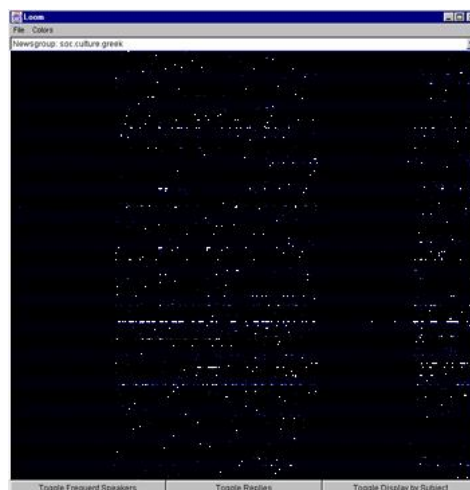
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# Visualization



People on  
y-axis



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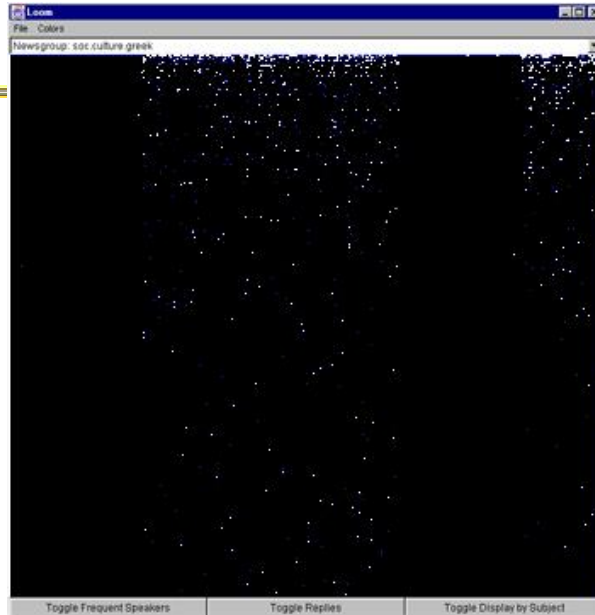
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Time on x-axis ->

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## Reorder

Resort ordering of people so that most frequent posters appear at top



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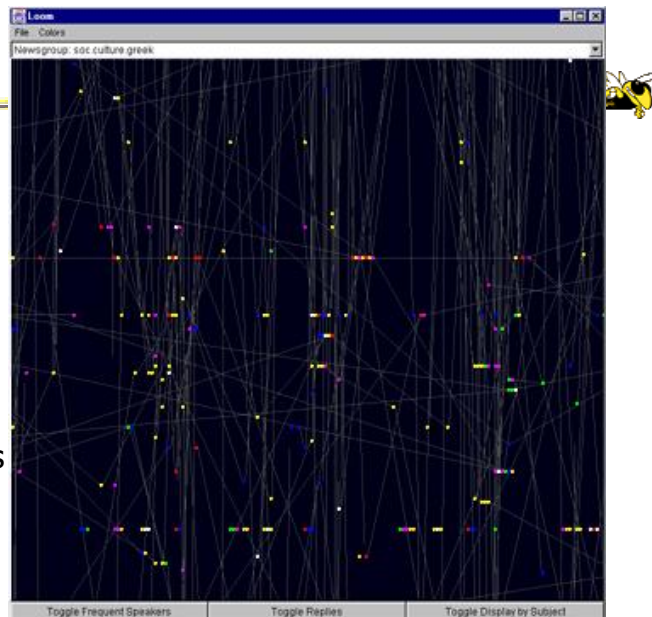
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## Zoom

Clicking on an area gives a zoomed in view of that region

Lines represent threads and connect postings

Color can be subject, domain, etc.



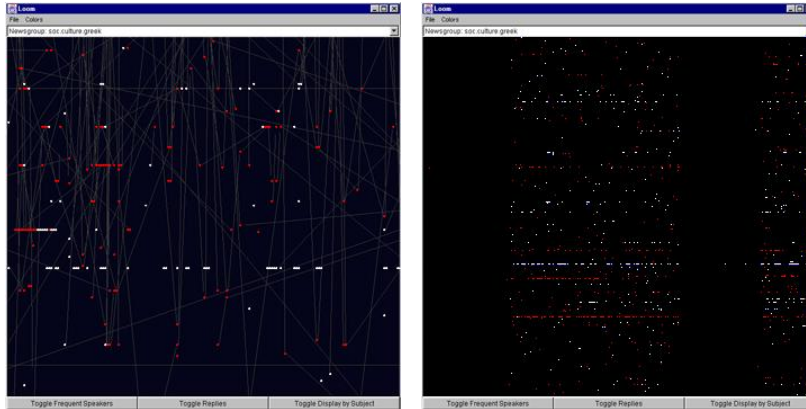
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## Post/Response



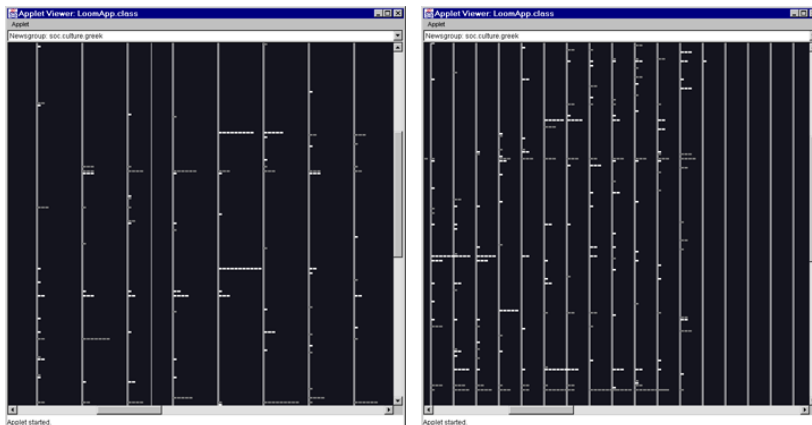
White items are original posts, replies are red

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## Day View



Lines separate different days during the period

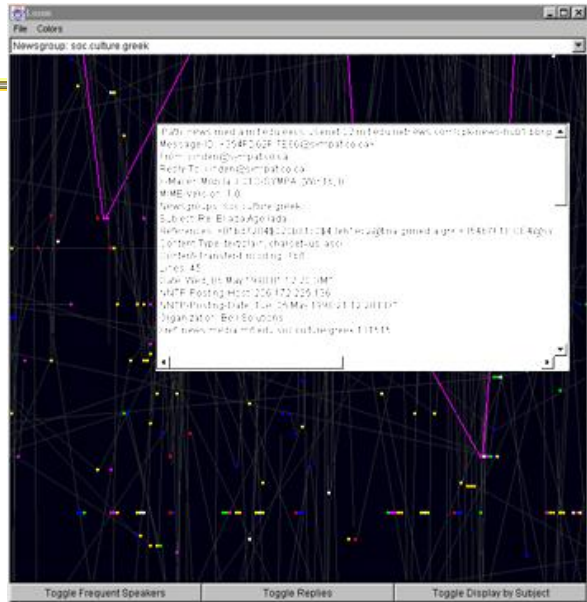
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## Posting Text

Clicking on an item shows the text of that posting



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## Web Activity Visualization



- What's hot?
- Who's interested in what I like?
- What is everyone else looking at?

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## Web Fan



- Visualize user activities at WebBoards, or Web-based message boards
- Visualizes a large set of Web pages with multiple levels
- Presents overview and comparison at the same time

R. Xiong

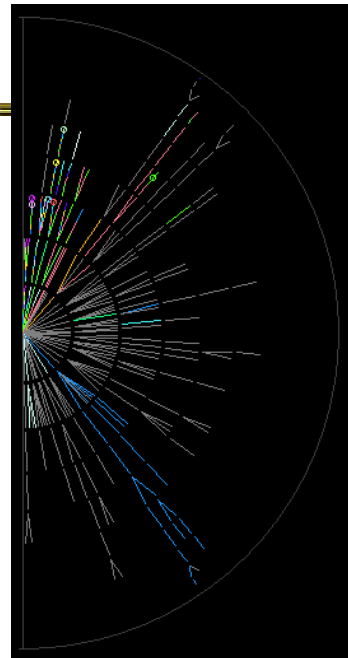
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## Visualization

- Each line is a message
- Responses shown as lines branching off
- Color represents user
- When user has read message, it becomes that color
- Messages can be multi-colored
- o indicates where user is now
- Interactive, so when mouse moves over, more detail is shown
- Can be animated



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## On-line Communities



- PeopleGarden
  - Visualization technique for portraying on-line interaction environments (Virtual Communities)
  - Provides both individual and societal views
  - Utilizes garden and flower metaphors

Xiong & Donath  
UIST '99

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## Particulars



- Who – Anyone visiting online community
- Problem – Help someone gain a more rapid understanding of the community as a whole and the individual participants
- Data – Postings from past

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## Data Portrait: Petals



Fundamental view of an individual



His/Her postings are represented as petals of the flower, arranged by time in a clockwise

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## Data Portrait: Postings



Time of Posting



New posts are added to the right

Slide everything back so it stays symmetric

Each petal fades over time showing time since posting

A marked difference in saturation of adjacent petals denotes a gap in posting

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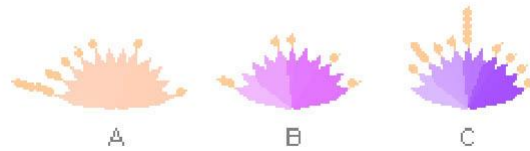
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## Data Portrait: Responses



Response to posting



Small circle drawn on top of a posting to represent each follow-up response

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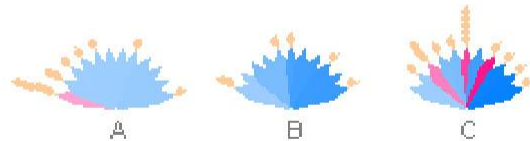
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## Data Portrait: Color



Initial post vs. reply



Color can represent original/reply  
Here magenta is original post, blue is reply

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## Garden

Combine many portraits to make a garden

Message board with 1200 postings over 2 months

Each flower is a different user  
Height indicates length of time at the board



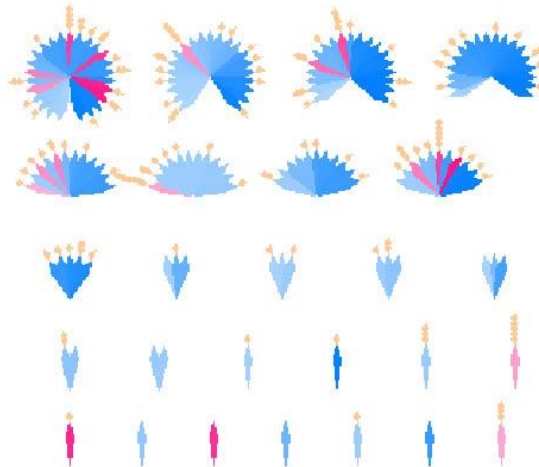
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## Alternate Garden View

Sorted by number of postings

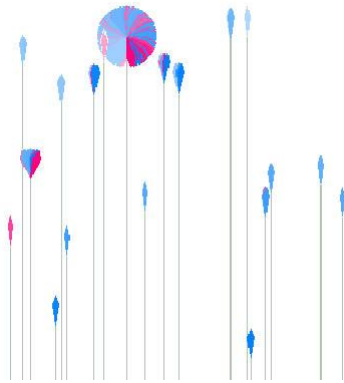


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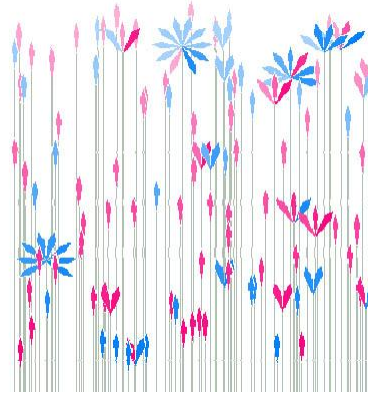
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# Interpreting Displays



Group with one dominating person

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More democratic group

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## Thoughts



- Is it an effective visualization technique?
- Likes/dislikes?

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# Email



- How much and to whom do you send?
- How much and from whom do you receive?
- Have your patterns changed?

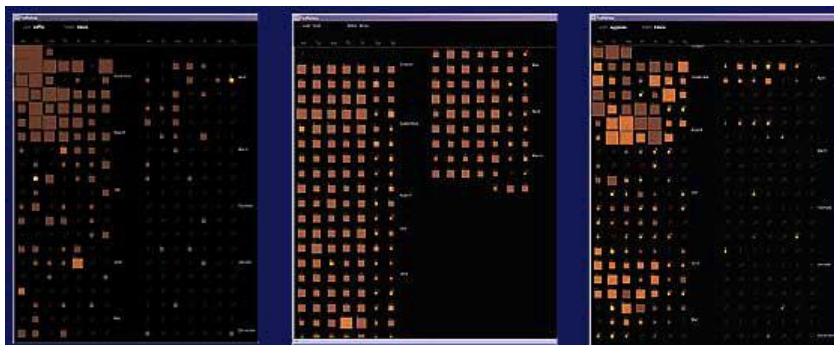
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# PostHistory

F. Viegas



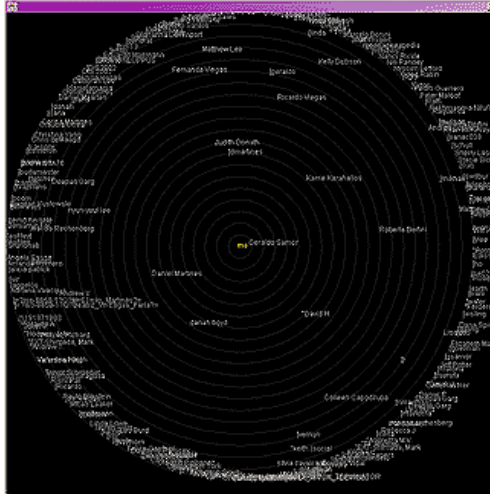
Mailbox visualization

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# Email Social Network



People to whom user sends email

Radius indicates frequency

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# Another Representation

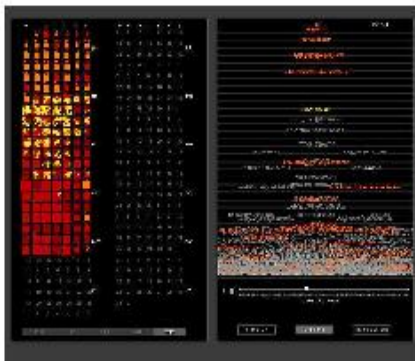


Fig 1. PostHistory interface with calendar panel on the left and contacts panel on the right. A contact name has been highlighted and the corresponding emails sent by this person have been highlighted in yellow on the calendar pane



Fig 2. PostHistory interface with the circular mode of the contacts panel on the right

alphabetical order or by the number of emails people

Viegas, Boyd, Donath  
HICSS '04

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# Themail



- Visualize one's email history
  - With whom and when has a person corresponded
  - What words were used
- Answer questions like:
  - What sorts of things do I (the owner of the archive) talk about with each of my email contacts?
  - How do my email conversations with one person differ from those with other people?

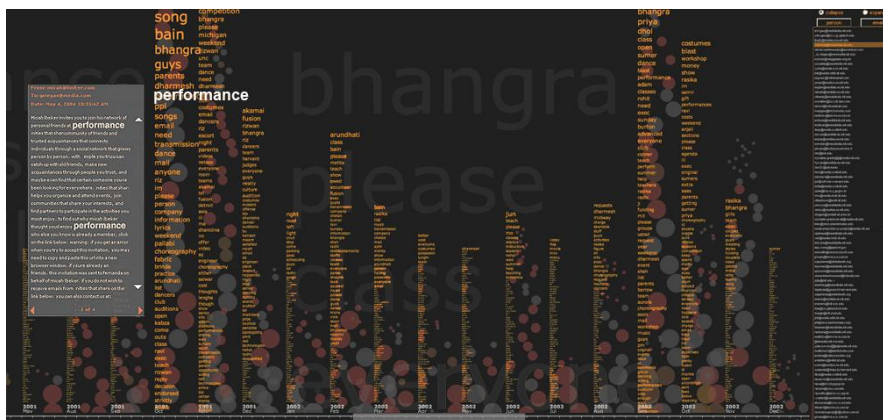
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Viégas, Golder & Donath  
CHI '06

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# Interface



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## User Study



- What type of user study did they conduct?

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## Baby Names



- We saw a demo back at the start of the term
- M. Wattenberg developed a visualization to help promote his wife's book on the topic
- Used 100+ years of US Census data on baby names
- Became an internet rage
  - 500,000 hits in first two weeks

Wattenberg & Kriss  
*TVCG '06*

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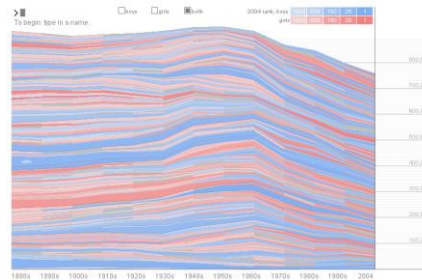
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# The Visualization



- Shneiderman's mantra
- Dynamic Query Approach
- Keyboard-based mechanism for filtering
- Pop-up boxes for details
- Smooth animation on each transition



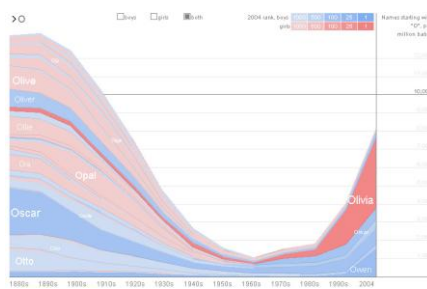
<http://babynamewizard.com/namevoyager/>

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# Examples



Result of typing O

Result of typing  
Unkown



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## Social Data Analysis



- Exploring data a social activity
- Stimulus to conversation and repartee
- Very effective style of data mining & analysis
- Data analysis that relies on social interaction as the source of motivation

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## Usage Characteristics



- Four distinct types of users
  - Achiever – expectant parents
  - Socializer – main motive is to have interaction with others
  - Explorer – gets delight in discovering odd or unexpected features
  - Killer- enjoys imposing themselves on others and causing distress

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## Key Factors for the Popularity



- Common Ground
- Personal Perspective
- Deep Pointers

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## Feedback



- Thoughts about the paper?

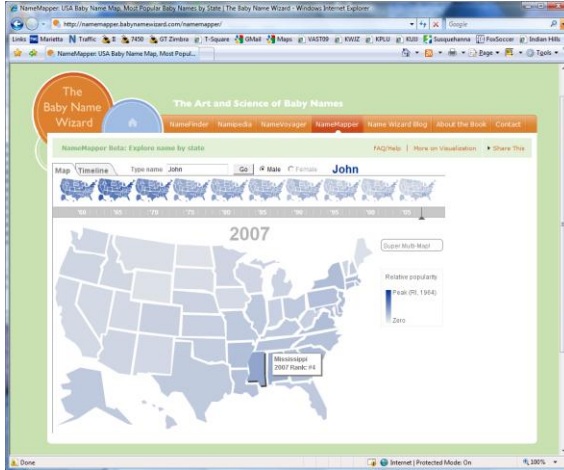
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# Follow-ons



Show usage changes over time and by state

(I'm still big in Mississippi)

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# More



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# Tweets



- Another hot topic in social visualization recently
- Flood of tweets can be overwhelming
  - Can we visualize them (maybe topics, authors, etc.) to provide a better overview and understanding?

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# Visual Backchannel



- Tweets used as backchannel for events such as conferences, political speeches, natural disasters, sports events, etc.
  - Usually just shown as stream
- Multi-view system showing topics, authors, accompanying media

Dörk et al  
*TVCG (InfoVis) '10*

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# LastHistory



- Visualizing a person's listening history from last.fm
- Want to support
  - Analysis
  - Reminiscing
- Potential to synchronize with photos and calendar entries from that time

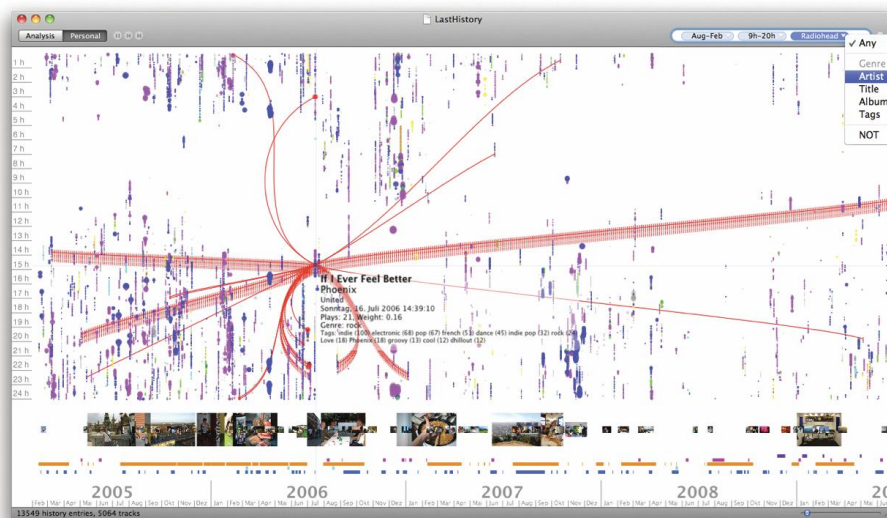
Baur et al  
TVCG (InfoVis) '10

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## Video



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## Upcoming

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- Animation
  - Reading
    - Heer & Robertson '07
- Visual Analytics 1
  - Reading
    - Keim et al '08

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## References

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- Figures, demos, papers, etc., taken from Social Media Group web pages

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