A Tale of Two Visualizations
Zephyria

User ID: 21721
Friends: 206
Age: 18
Gender: Female
Status: Single
Location: San Francisco, CA
Hometown: Lancaster, PA
Occupation: researcher, social networks, identity, context
Interests: Schizophrenia, observing people, culture, questioning power, reading, Buddhism, injury, computer-mediated communication, social networks, technology, anthropology, stamping
Music: The Chemical Brothers, Infected Mushroom, Sun Kil, (b)og(post) Digital Structures, Ani DiFranco, down4tempo, Thievery Corporation, Beth Orton, Mearce, Vase, White Stripes
Books: Richard D. Hofstadter, Stanley Milgram, Jeanette Winterson, Eric Schlosser, Leslie Feinberg, Dorothy Allison, Italo Calvino, Hermann Hesse
TV Shows: ?
Movies: Kannada, Always, Welsh Life, Tank Girl, The Matrix, Clockwork Orange, American Beauty, Fight Club, Boys Don't Cry
Member Since: ??
Last Login: 2000-02-21
Last Updated: 2001-10-21
About: Some know me as danah...

I'm a geek, an activist and an academic, fascinated by people and society. I see life as a very large playground and enjoy exploring its intricacies. I revel in life's chaos, while simultaneously providing my own insane element.

My musings: http://www.zephyria.org/thoughts/

Want to Meet: Someone who makes life's complexities seem simply elegant.

 Może this helps?
Observations

Groups spent more time in front of the visualization than individuals.

Friends encouraged each other to unearth relationships, probe community boundaries, and challenge reported information.

Social play resulted in informal analysis, often driven by story-telling of group histories.
Social Data Analysis

Visual sensemaking is a social process as well as a cognitive process.

Analysis of data coupled with social interpretation and deliberation.

How can user interfaces catalyze and support collaborative visual analysis?
sense.us

A Web Application for Collaborative Visualization of Demographic Data

with Fernanda Viégas and Martin Wattenberg
Dogear Tags
Dogear Tag Usage, May 2005 to August 2006
source: IBM Dogear
10 comments

Dogear People
Dogear Bookmarking by Person, May 2005 to August 2006
source: IBM Dogear
1 comment

Job Voyager
Reported Occupations of U.S. Labor Force, 1850-2000
source: http://ipums.org
139 comments

Birthplace Voyager
Reported Birthplace of U.S. Residents, 1850-2000
source: http://ipums.org
10 comments

sense.us - social data visualization
sense.us is a prototype system for collaborative visualization.
- See the data. See what people have to say about it.
- Dive into the data and share your explorations.

The site requires Java 1.5+ and either Firefox or Internet Explorer. Use your IBM W3/BluePages e-mail and password to login. Use at least 1024x768 resolution for the best experience.

Check out the user's guide and privacy policy before getting started.

Having problems using Firefox with Java 1.4? Some users using Firefox and Java 1.4 have found that comments aren't loading properly. If you run into this problem, consider upgrading to Java 1.5 (Windows, Linux) or using Internet Explorer (on Windows systems). Sorry for any inconvenience!

U.S. Census State Map
State Map of 2000-2005 Census Data
source: U.S. Census Bureau
16 comments

Population Pyramid
U.S. Population Demographics, 1850-2000
source: http://ipums.org
7 comments
Supporting Collaboration

Sharing within visualizations and across the web


comments (5)  New Comment | View All (143)

▼ Is this military info right?
I would have expected a different pattern for the military, but then again maybe this is just the military industrial complex growing and growing.
by Martin Sharp on Fri Jul 21, 2006 10:15 AM

here are labels where I would have expected big jumps.
  by Martin Sharp on Fri Jul 21, 2006 10:16 AM

well, there was also the cold war right after WW2, which might be part of the reason why there's such a huge jump after the 40s. It is also interesting that there is such a drop between the 70s and the 80s.
by Julia Hernandez on Fri Jul 21, 2006 11:01 AM

I guess a lot of it has turned to robots, and the industrial complex, as Martin suggested, though it would be interesting to see the comparison of the fall in military personal next to the rise in DOD funding for robots and industry.
by Jess O'Brien on Fri Jul 21, 2006 11:51 AM

I think the jumps have more to do with the economy at large rather than any particular military conflict. Lots of money in conflict has already been spent before the conflict starts.
  by Fred Klein on Wed Aug 2, 2006 10:24 AM

reply

bookmarks (1)  Add View | Save | Load | View All
Supporting Collaboration

Sharing within visualizations and across the web

Pointing at interesting trends, outliers
Supporting Collaboration

Sharing within visualizations and across the web
Pointing at interesting trends, outliers
Collecting and linking related views
Supporting Collaboration

Sharing within visualizations and across the web
Pointing at interesting trends, outliers
Collecting and linking related views
Awareness of social activity
Supporting Collaboration

Sharing within visualizations and across the web
Pointing at interesting trends, outliers
Collecting and linking related views
Awareness of social activity
Embedding in external media (blogs, wikis, …)
Supporting Collaboration

Sharing within visualizations and across the web
Pointing at interesting trends, outliers
Collecting and linking related views
Awareness of social activity
Embedding in external media (blogs, wikis, …)
Don’t disrupt individual exploration
User Study Design

30 participant laboratory study
25 minute, unstructured sessions with job voyager

3-week live deployment on IBM intranet
Employees logged in using intranet accounts

Data analyzed
12.5 hours of qualitative observation
258 comments (41 pilot, 85 ibm, 60 ucb, 72 live)
Usage logs of user sessions
Voyagers & Voyeurs

Complementary faces of analysis

**Voyager** - focus on visualized data
Active engagement with the data
Serendipitous comment discovery

**Voyeur** - focus on comment listings
Investigate others’ explorations
Find people and topics of interest
Catalyze new explorations
Social Data Analysis
Spotfire Decision Site Posters

Sales overview - December
Sales result overview for December. Positive change in WE, while poor performance in the other regions.

Decision Status: Open
Open in DecisionSite Client

Annotations:

- Sales overview - December 2004-12-29
  Sales result overview for December. Positive change in WE, while poor performance in the other regions.
  Decision Status: Open
  Open in DecisionSite Client

- Sales overview - December 2004-12-29
  The only territory outside of the WE with any real gain is territory 21.
  Add Annotation...
The Status of George Bush’s War on Terrorism

Incidents, injuries, and deaths from terrorism have increased during the new millennium. This may be because of the broader definition of what characterizes a terrorist act, or it may actually be a constant increase in such acts. — seema

Comments (12)

Anonymous says
Go BuSH!
posted 11 months ago

Tyler says
What a completely disingenuous graph, and comments to follow. You have absolutely no reason to think the line would stay flat without Bush.
You probably thought graphs like these (and your site more widely) would help people overcome preconceived notions by showing hard data.
Instead, you’re just amplifying people’s preconceived notions — adding legitimacy for the very thing you were trying to show was a myth.
posted 10 months ago

Legend
- Global Terrorist Incidents, 1960-2007
- Incidents
- Injuries
- Fatalities

Tags
no tags yet

Community Tags
Add tags
no tags yet

Correlations
89% Injuries and Fatalities

Related Graphs
- Yearly Terrorism Statistics
- Global Terrorism Incidents and Iraq Body Count
- Reported Maximum vs. The Status of George Bush’s War on Terrorism
- Reported Maximum vs. The Status of George Bush’s War on Terrorism
- Reported Maximum vs. The Status of George Bush’s War on Terrorism

Share this Graph
- Send an Email
- Post to Blog
- 11 diggs
digg

Rate It
- 3 ratings
- Sign in to rate

Like It
- Feature It
Visualizations: Guantanamo Bay Detainees, release status & age

Can't see the visualization? Download the latest Java plugin here. On Maps, best viewed in Safari.

Created by: Martin Walterberg Created on: Saturday February 24, 12:06 PM

Many-Eyes
Discussion
Great depression "killed" a lot of brokers

Stock Broker

- all
- men
- women

Total People Count

1850 1870 1900 1920 1940 1960 1980 2000

Stock Broker

700,000 600,000 500,000 400,000 300,000 200,000 100,000
“Valley of Death”
Visualizations: Flawed Data - Temp Over Time and CO2 Levels

This view shows the correlation between...

Creator: Bruce
Tags:
Feature prevalence from content analysis (min Cohen’s $\kappa=.74$)

High co-occurrence of Observation, Question, and Hypothesis
Sharing in External Media
Data Quality
No cooks in 1910? … There may have been cooks then. But maybe not.
The great postmaster scourge of 1910? Or just a bug in the data?
Independent by Religious Tradition

Created by The New York Times
Anonymous says:
Um, I believe Church of Jesus Christ of Latter-day Saints and Mormon are the same?
16% of sense.us comments and 10% of Many-Eyes comments reference data integrity issues.
Data Integration *In Situ*
Heroin vs. Cocaine vs. MDMA (Ecstacy) vs. Crystal Meth.

By guest on Dec 19, 2006
Viewed 20481 times

Legend
- College Student Drug Use
  - MDMA (Ecstacy)
  - Cocaine
  - Heroin
  - Crystal Meth.

Tags
no tags yet

Community Tags
no tags yet

Correlations
81% MDMA (Ecstacy) and Crystal Meth.

Related Graphs
Heroin vs. Cocaine vs. MDMA (Ecstacy) vs. Crystal Meth.
Cocaine vs. MDMA (Ecstacy) vs. Crystal Meth.

Sources: University of Michigan

Comments (1 - 20 of 32)

jonny12 says
posted about 1 year ago

jonny15

Anonymous says
Where's the pot?
Marijuana vs. Heroin vs. Cocaine vs. MDMA (Ecstasy) vs. Crystal Meth.

By guest on Mar 12, 2007
Viewed 25401 times

Legend

College Student Drug Use
- Marijuana
- MDMA (Ecstasy)
- Cocaine
- Heroin
- Crystal Meth.

Tags
no tags yet

Community Tags
no tags yet

Correlations
See all

Sources: University of Michigan

Comments (17)

visnu says
pot pot pot pot
weed weed weed weed
posted about 1 year ago

MARTY says

Share this Graph
- Send an Email
- Post to Blog

Digg submit

Rate It
- 0 ratings
Visualizations: Harry Potter is Freaking Popular

Number of Libraries Contained in

To highlight or find totals click or ctrl-click.
What factors enable viable collaborations?
How might we design systems to facilitate social data analysis?
Administrivialia
Final Project

Poster Presentations
Session is Tue Jun 7 5-8pm in CSE Atrium
Bring Poster + Laptop/Device for demos
Arrive early to setup!

Post Webpage on GitHub Pages
List team members, title, abstract, link to paper
Include summary image for project!

Final Project Reports
Due Thu Jun 9, by 8am, posted to GitHub
4-6 pages in ACM or IEEE TVCG format
Design Considerations for Collaborative Analysis
Modules of Contributions

Data Management
- Contribute Data
- Clean Data
- Categorize Data
- Moderate Data
- Create Metadata

Visualization
- Select Data Sources
- Apply Visual Encoding
- Author Software

Visual Analytics
- Observations
- Hypotheses
- Evidence (+/-)
- Summarize
- Report / Presentation

Raw Data → Data Tables → Visual Structures → Views

Data Transformations → Visual Mappings → View Transformations
Sensemaking

- forage for data
- search for schema
- instantiate schema
- task operations
- problem-solve
- author, decide, or act
- overview
- zoom
- filter
- details-on-demand
- browse
- search query
- reorder
- cluster
- class
- average
- promote
- detect pattern
- abstract
- read fact
- read comparison
- read pattern
- manipulate
- create
- delete
Design Considerations

Division, allocation, and integration of work
Common ground and awareness
Reference and deixis (pointing)
Identity, trust, and reputation
Group formation and management
Incentives and engagement
Presentation and decision-making
Social Data Analysis

How can users’ activity traces be used to improve awareness in collaborative analysis?
Social Navigation
Wattenberg & Kriss - Color by history: gray regions have already been visited
Scented Widgets [InfoVis’07]

Visual navigation cues embedded in interface widgets
Comment Counts

Occupation
- Lumberman
- Machinist
- Mail Carrier
- Manager / Owner
- Mason
- Policeman
- Metal Worker
- Midwife
- Military
- Miller
- Milliner
- Millwright
- Miner
- Model Maker
- Molder
- Motion Picture Projectionist
- Makerman

Scale
- Total People Count
- % of Work Force
- # of comments

Military

1850  1870  1900  1920  1940  1960  1980  2000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
No Scent (Baseline)
Do Activity Cues Affect Usage?

Hypotheses: With activity cues, subjects will
1. Exhibit more revisitation of popular views
2. Make more unique observations

Controlled experiment with 28 subjects
Collect evidence for and against an assertion
Varied scent cues (3) and foraging task (3)
Activity metrics collected from sense.us study
“Technology is costing jobs by making occupations obsolete.”
Results

Unique Discoveries
Visit scent had sig. higher rate of discoveries in first block. Less reliance on scent when subjects were familiar with data and visualization.

Revisitation
Visit and comment scent conditions correlate more highly with seed usage than no scent.
Social Data Analysis

How can users’ **activity traces** be used to improve collaborative analysis?

How should **annotation techniques** be designed to provide nuanced pointing behaviors?
Do you see what I see?

http://sense.us/birthplace#region=Middle+East
Common Ground

**Common Ground:** the shared understanding enabling conversation and collaborative action  
[Clark & Brennan ‘91]

Do you see what I see? -> View sharing (URLs)

How do collaboration models affect grounding?  
Linked discussions vs. embedded comments vs. …

**Principle of Least Collaborative Effort:** participants exert *just enough* effort to successfully communicate.  
[Clark & Wilkes-Gibbs ‘86]
“Look at that spike.”
“Look at the spike for Turkey.”
“Look at the spike in the middle.”
Free-form

Data-aware
## Use of Annotations

<table>
<thead>
<tr>
<th>Icon</th>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>✈️</td>
<td>Arrows</td>
<td>25.1%</td>
</tr>
<tr>
<td>📜</td>
<td>Text</td>
<td>24.6%</td>
</tr>
<tr>
<td>⬢️</td>
<td>Ovals</td>
<td>17.9%</td>
</tr>
<tr>
<td>🖋️</td>
<td>Pencil</td>
<td>16.2%</td>
</tr>
<tr>
<td>🔁️</td>
<td>Lines</td>
<td>14.5%</td>
</tr>
<tr>
<td>☐️</td>
<td>Rectangles</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

39.0% of comments included annotations

*Pointing* to specific points, trends, or regions (88.6%)

*Drawing* to socialize or tell jokes (11.4%)

**Variety of subject responses**

‘Not always necessary’, but ‘surprisingly satisfying’

Some concern about professional look
Social Data Analysis

How can users’ **activity traces** be used to improve collaborative analysis?

How should **annotation techniques** be designed to provide nuanced pointing behaviors?

How can interface design better support communication of analytic findings?
State Map of 2000-2005 Census Data (source: U.S. Census Bureau)

Female persons percent 2004

All the Men are Moving to Nevada?

Compare this "where the women are" with the population increase maps. Nevada is booming, but not with women.

by Andrew Roberts on Wed Sep 6, 2006 5:19 PM

Well, duh, they still make up 49% in Nevada. Those nice color ranges made me lazy. Or is this an important UI issue? The range between color extremes changes with little notice, perhaps causing the viewer, as I did, to assume that there is a constant, or larger, range of change than is actually present.

by Andrew Roberts on Wed Sep 6, 2006 5:23 PM

is Las Vegas causing a massive shift (i.e. gamblers)? since the entire state is being colored uniformly, you get the impression that this is an even distribution, but the reality might be very different due to large aggregations of people around the major cities.

by Thomas Chang on Wed Sep 6, 2006 5:37 PM

I think one or two percentage points might actually make a big difference in the culture... any Alaskans care to comment?

by Martin Sharp on Wed Sep 6, 2006 7:10 PM

test

by Michael Rogers on Wed Sep 27, 2006 1:49 AM

See something interesting? Add a comment, it's easy!
Graphical Analysis Histories
Sum of Inventory for each State broken down by Market and Market Size.

Sum of Inventory for each Product broken down by Market, Market Size and State.
Social Data Analysis

How can users’ activity traces be used to improve collaborative analysis?

How should annotation techniques be designed to provide nuanced pointing behaviors?

How can interface design better support presentation of analytic findings?

How can contributions be better integrated?
Structured Conversation

Reduce the cost of synthesizing contributions
Integration: Evidence Matrices

Alpha’s ACH matrix
Integration: Evidence Matrices

Alpha’s CACHE workspace

- Beta’s matrix
- Ticker
- Gamma’s matrix
- Chat tool

Sharing & coordination

Individual analysis

Search

Alpha’s ACH matrix

Read & Interpret

Figure 3: CACHE Workspace for composite integration. Alpha’s Search, ACH, and Gamma’s matrices are linked with the Ticker and Chat tool for shared analysis and coordination.
Merging Analysis Structures [Brennan '06]
Design Considerations

Division, allocation, and integration of work
Common ground and awareness
Reference and deixis (pointing)
Identity, trust, and reputation
Group formation and management
Incentives and engagement
Presentation and decision-making
Ongoing Work

How to better structure analysis tasks?
Observe trends / patterns of interest
Generate hypotheses
Marshall evidence for/against a claim
*Structured tasks improve outcomes* [Willett 2011]

How to better encourage participation?
Narrative: storytelling to spur exploration
Financial incentives / crowdsourcing [Willett 2012]
Social Data Analysis

Visual sensemaking is a social process as well as a cognitive process.

Analysis of data coupled with social interpretation and deliberation.

How can user interfaces catalyze and support collaborative visual analysis?