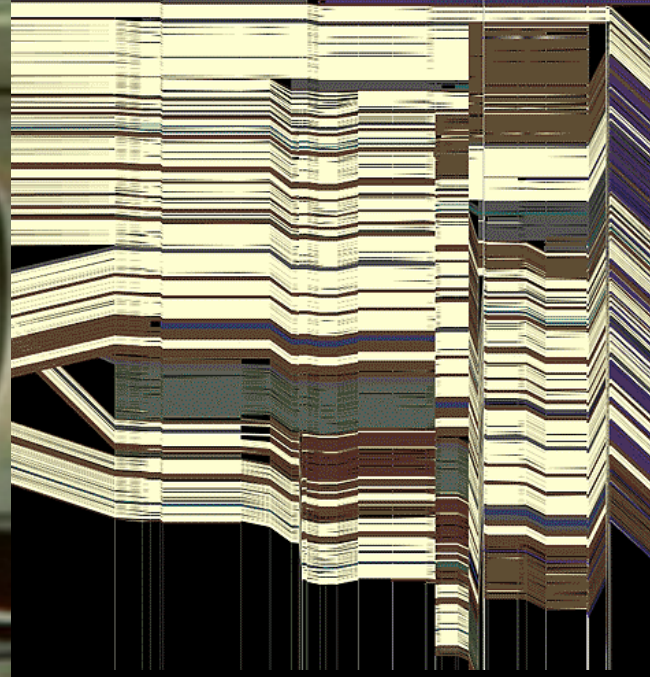
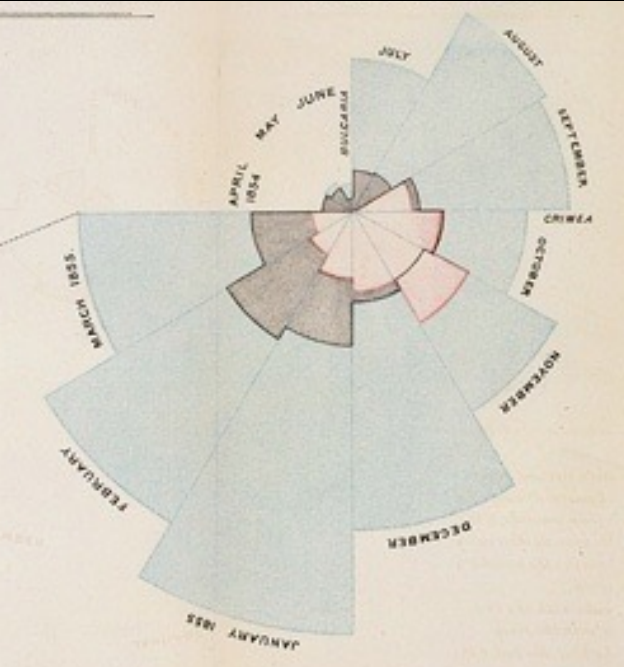


CSE 512 - Data Visualization

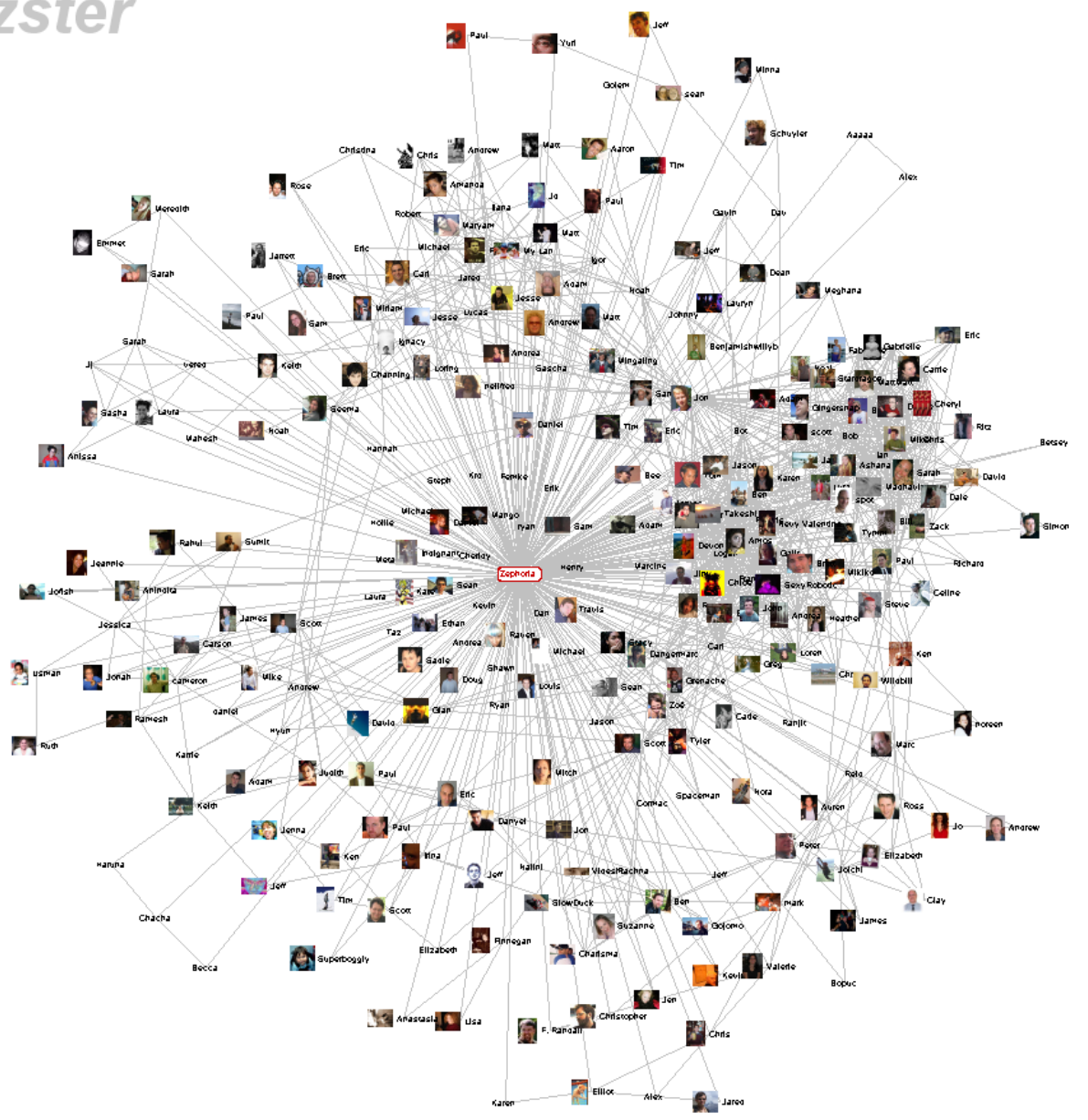
Collaborative Analysis



Jeffrey Heer University of Washington

A Tale of Two Visualizations

vizster



Zephoria

User ID	21721
Friends	<input type="checkbox"/> 266
Age	??
Gender	<input type="checkbox"/> Female
Status	<input type="checkbox"/> Single
Location	San Francisco, CA
Hometown	Lancaster, PA
Occupation	researcher: social networks, identity, context
Interests	apophenia, observing people, culture, questioning power, reading, buddhism, ipseity, computer-mediated communication, social networks, technology, anthropology, stomping
Music	psytrance/goa/trance [Infected Mushroom, Son Kite... Iboga/Digital Structures], Ani Difranco, downtempo, Thievery Corporation, Beth Orton, Morcheeba, Ween, White Stripes
Books	Authors: Erving Goffman, Stanley Milgram, Jeanette Winterson, Eric Schlosser, Leslie Feinberg, Dorothy Allison, Italo Calvino, Hermann Hesse
TV Shows	??
Movies	Koyaanisqatsi, Amelie, Waking Life, Tank Girl, The Matrix, Clockwork Orange, American Beauty, Fight Club, Boys Don't Cry
Member Since	??
Last Login	2003-10-21
Last Updated	2003-10-21
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.zephoria.org/thoughts/>

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

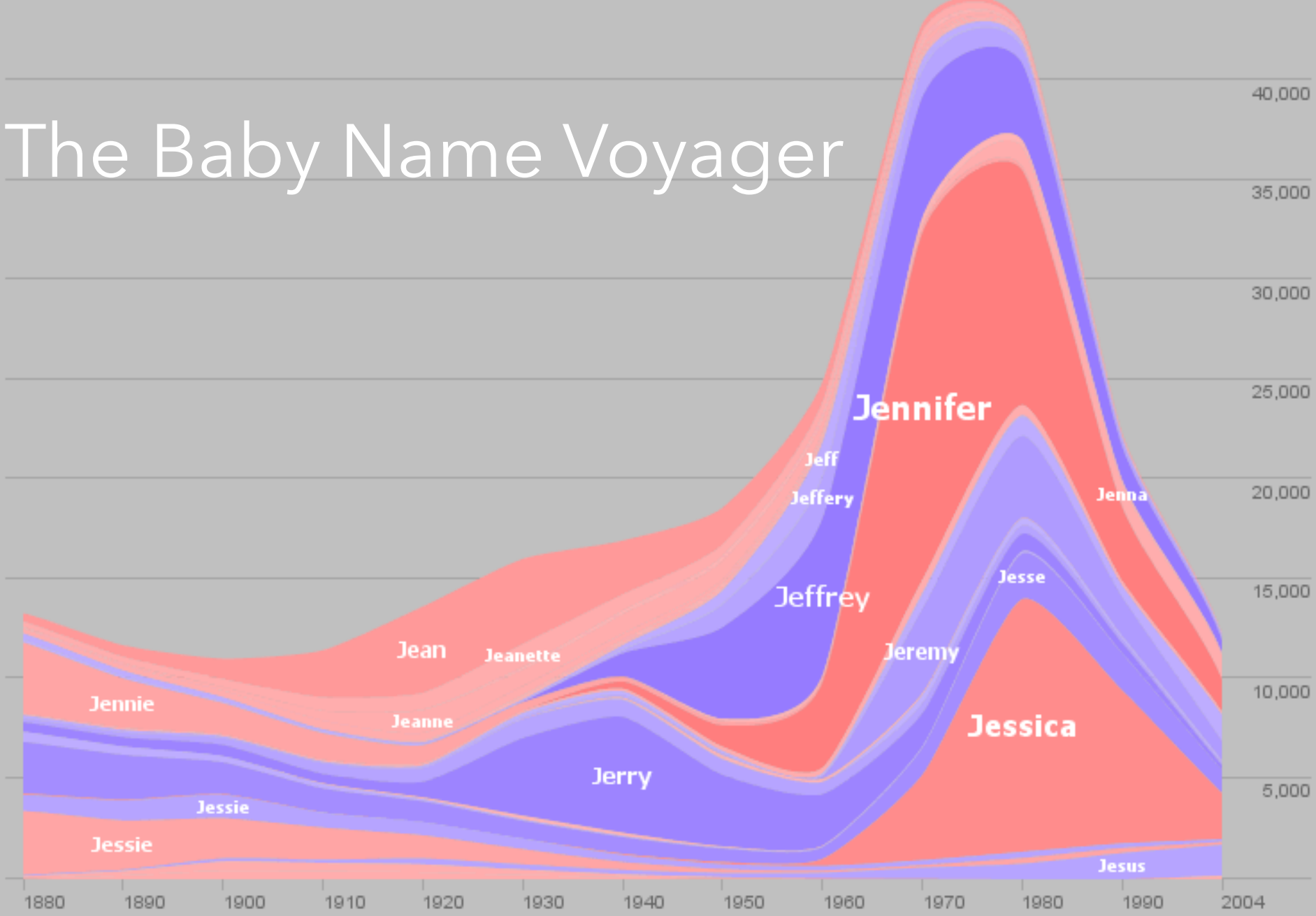
Observations

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.

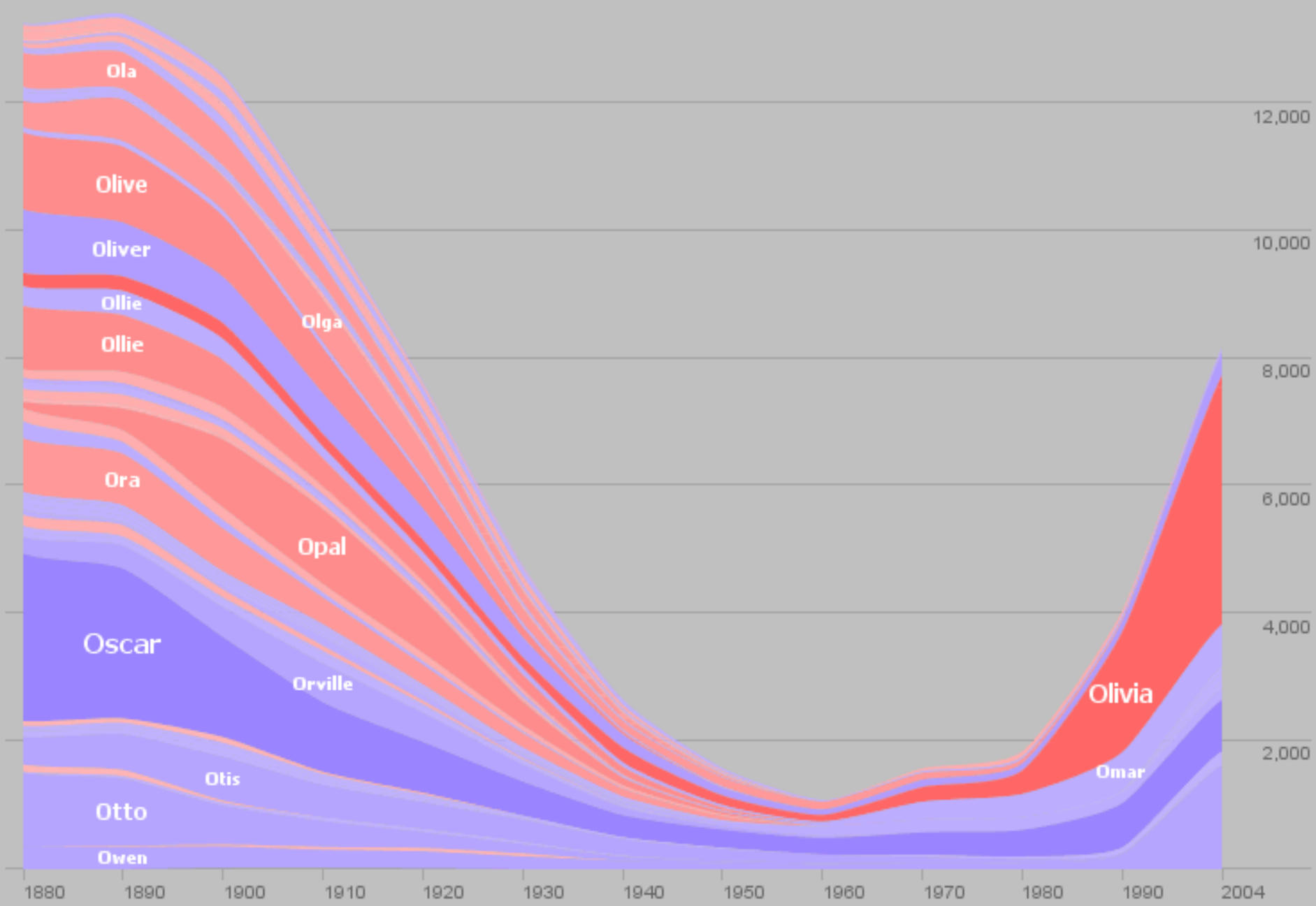
Social play resulted in informal analysis, often driven by story-telling of group histories.

The Baby Name Voyager



name >> je|

● all ● girls ● boys



name >> o

● all ● girls ● boys

Social Data Analysis

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

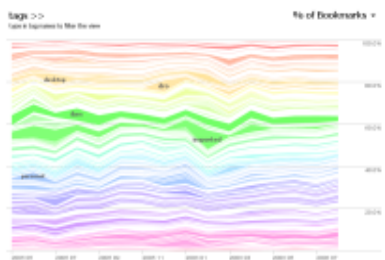
Analysis of data coupled with **social interpretation and deliberation.**

How can user interfaces catalyze and support **collaborative visual analysis?**

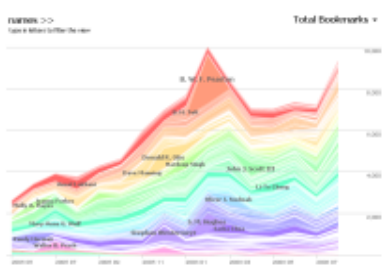
sense.us

A Web Application for Collaborative
Visualization of Demographic Data

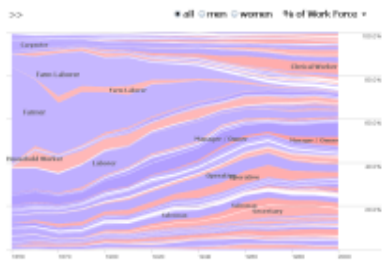
with **Fernanda Viégas** and **Martin Wattenberg**



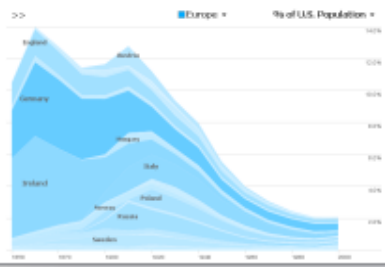
Dogear Tags
 Dogear Tag Usage, May 2005 to August 2006
 source: IBM Dogear
10 comments



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

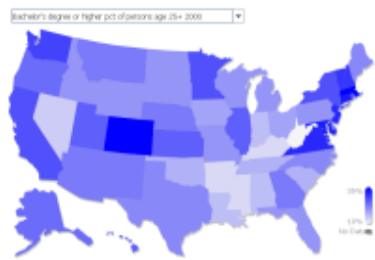
sense.us is a prototype system for collaborative visualization.

- See the data. See what people have to say about it.
- Dive into the data and share your explorations.

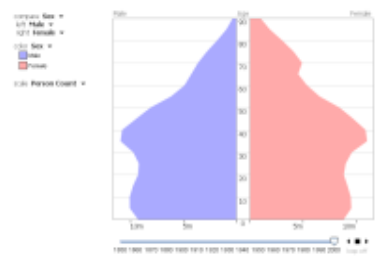
The site requires **Java 1.5+** and either **Firefox** or **Internet Explorer**. Use your **IBM W3/BluePages e-mail and password** to login. Use at least **1024x768** resolution for the best experience.

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



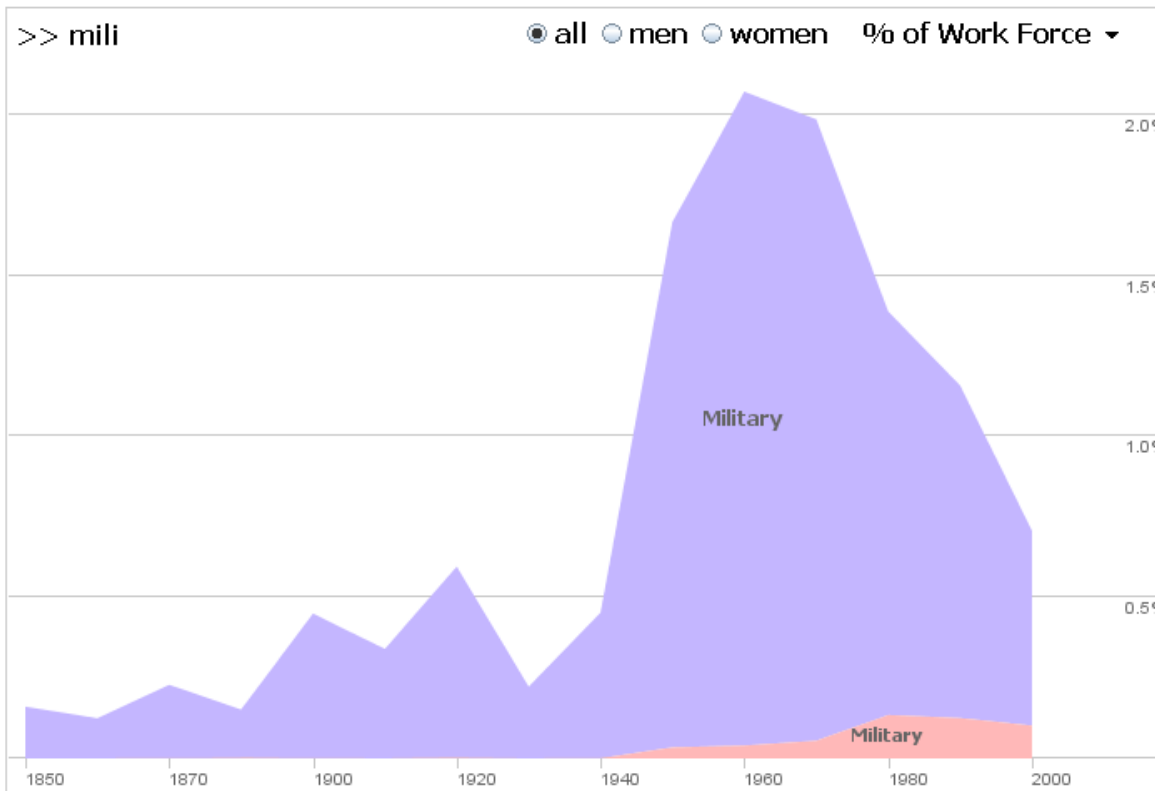
Population Pyramid
 U.S. Population Demographics, 1850-2000
 source: <http://ipums.org>
7 comments

Supporting Collaboration

Sharing within visualizations and across the web

<http://sense.us/jobs#scale=1&gender=All&query=mili>

Reported Occupations of U.S. Labor Force, 1850-2000 (source: <http://ipums.org>)



comments (5) [New Comment](#) | [View All \(143\)](#)

▼ [Is this military info right?](#) (5)

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 **Jesse 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](#)

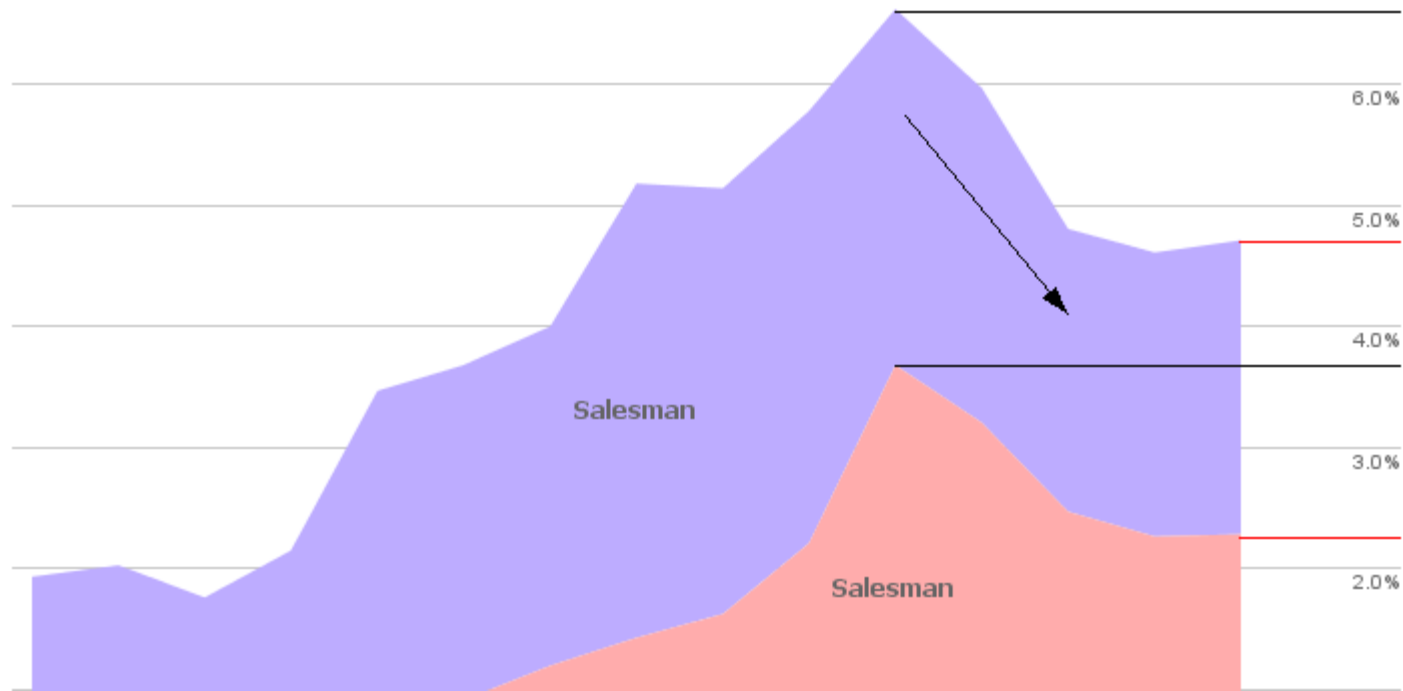


Supporting Collaboration

Sharing within visualizations and across the web

Pointing at interesting trends, outliers

Annotate  Stroke  Fill    Sans-Serif ▼ 14 ▼ **B I**



Supporting Collaboration

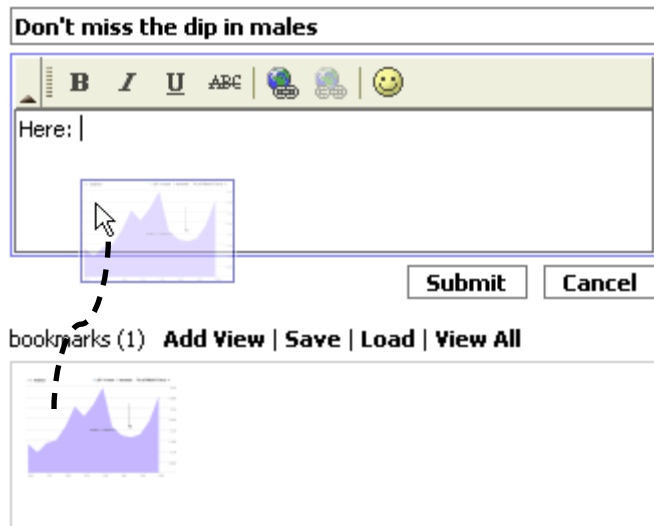
Sharing within visualizations and across the web

Pointing at interesting trends, outliers

Collecting and linking related views

Don't miss the dip in males

Here: |



Submit Cancel

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

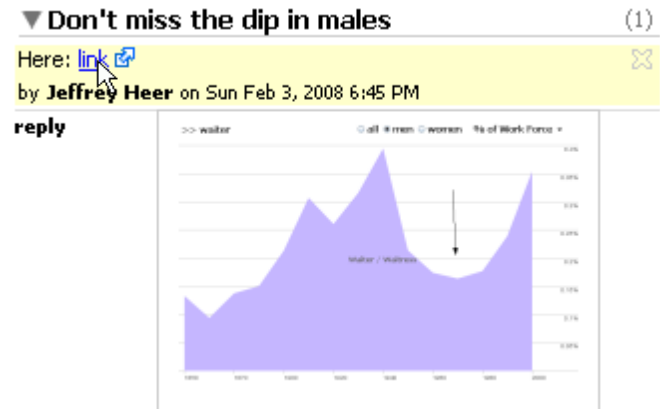


▼ Don't miss the dip in males (1)

Here: [link](#)

by Jeffrey Heer on Sun Feb 3, 2008 6:45 PM

reply



walker all men women % of Work Force

Supporting Collaboration

Sharing within visualizations and across the web

Pointing at interesting trends, outliers

Collecting and linking related views

Awareness of social activity



Ushers?

Is this like the movie theatre kind of usher?
by **Martin Sharp** on Fri Jul 21, 2006 10:24 AM



Drop in household workers

This trend is almost the opposite of the "clerical worker" and "secretary" categories.
by **Julia Hernandez** on Fri Jul 21, 2006 10:50 AM



Disappearing professors???

Note how a bunch of different kinds of professors "disappear" in the year 2000.
Is this just a change in the way the census aggregates data?
by **Julia Hernandez** on Fri Jul 21, 2006 11:07 AM

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

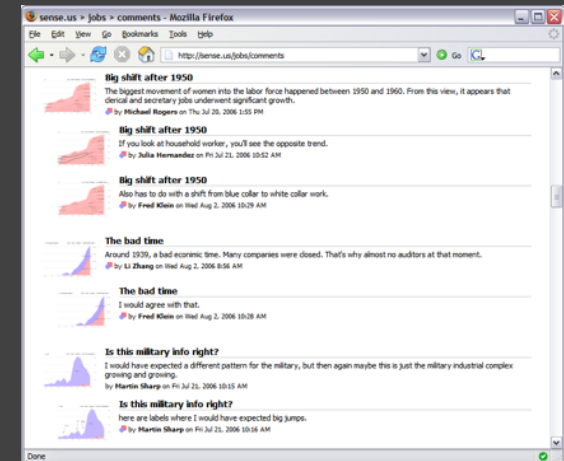
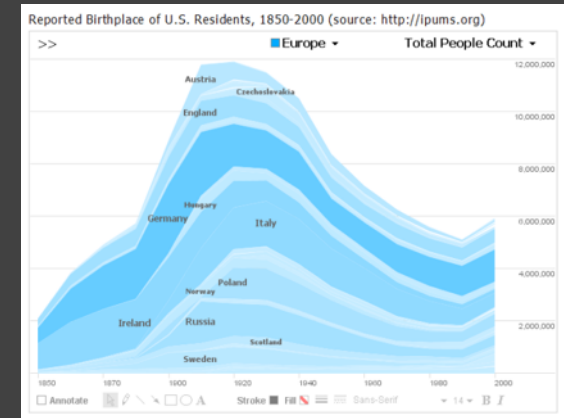
Serendipitous comment discovery

Voyeur – focus on comment listings

Investigate others' explorations

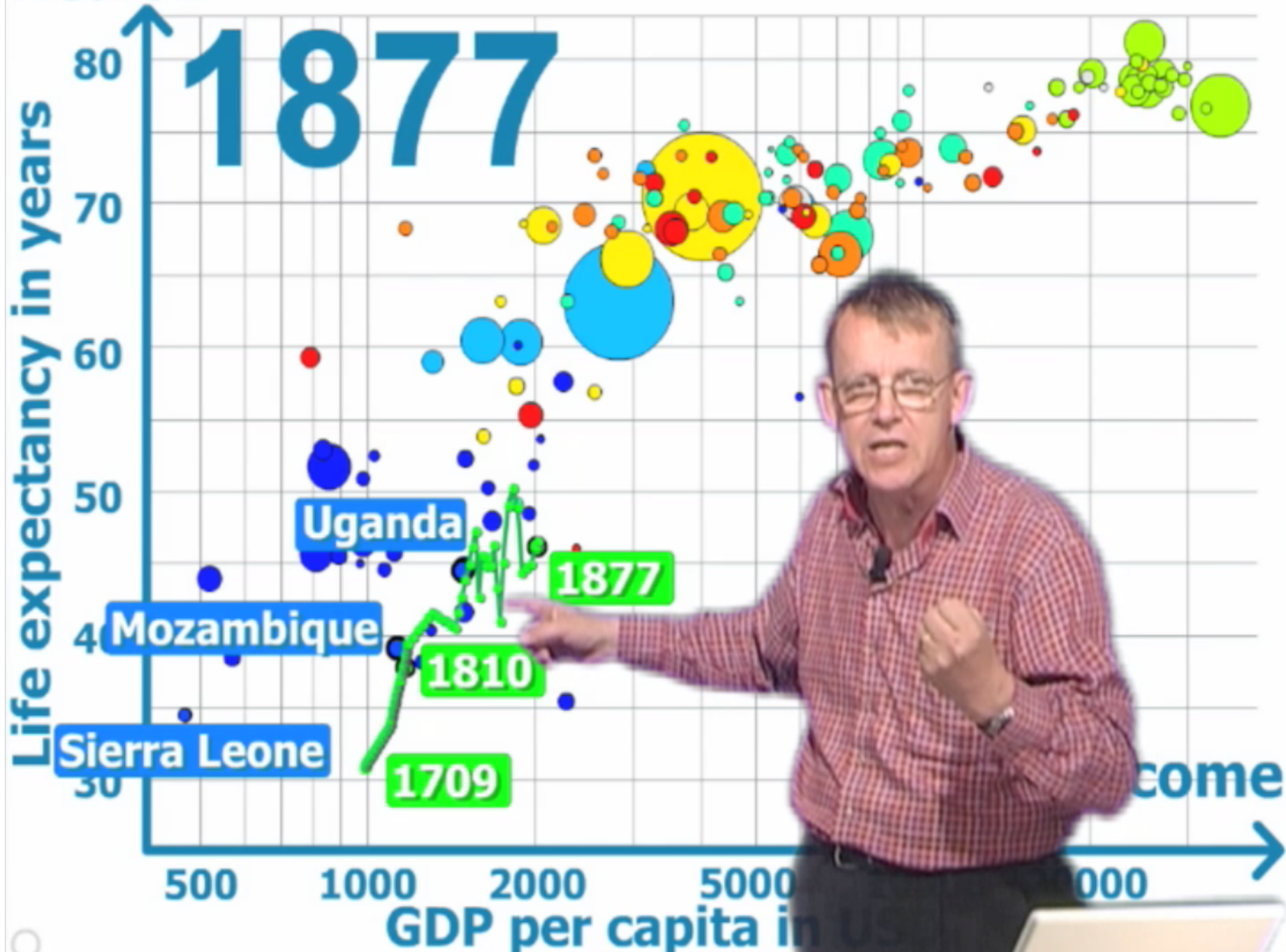
Find people and topics of interest

Catalyze new explorations



Social Data Analysis

Health





Spotfire DecisionSite Posters - Microsoft Internet Explorer

Address: http://preview.spotfire.com/spotfire/library?guid=b92745b0-5c2e-11d9-b49e-0010c0a80214

Spotfire DecisionSite Posters

Menu Help

Sales overview- December

larsb@spotfire.com 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

Annotations

larsb@spotfire.com 2004-12-29 View

Original bookmark

larsb@spotfire.com 2004-12-29 View

The only territory outside of the WE with any real gain is territory 21.

Add Annotation...

Share change over regions and territories

Category color by Territory

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22

Query Devices

4999/4999 selected

Sales quadrant

- 1
- 2
- 3
- 4
- Include empty values

Class change vs share change

MyShare change from Q3 to Q4

Category color by Sales quadrant

- 1
- 2
- 3
- 4
- (Empty) color
- Marking color

New DecisionSite Poster 'Sales overview- December' added - Message (HTML)

From: larsb@spotfire.com Sent: Wed 12/29/2004 3:54 PM

To: Lars Bauerle

Cc:

Subject: New DecisionSite Poster 'Sales overview- December' added

A new DecisionSite Poster, Sales overview- December, has been published to the DecisionSite Library.

(Click [here](#) to login to the full Spotfire DecisionSite Poster) [Login information](#)

Spotfire DecisionSite Poster

Sales overview- December

larsb@spotfire.com, 2004-12-29

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

Clippings

Share change over regions and territories

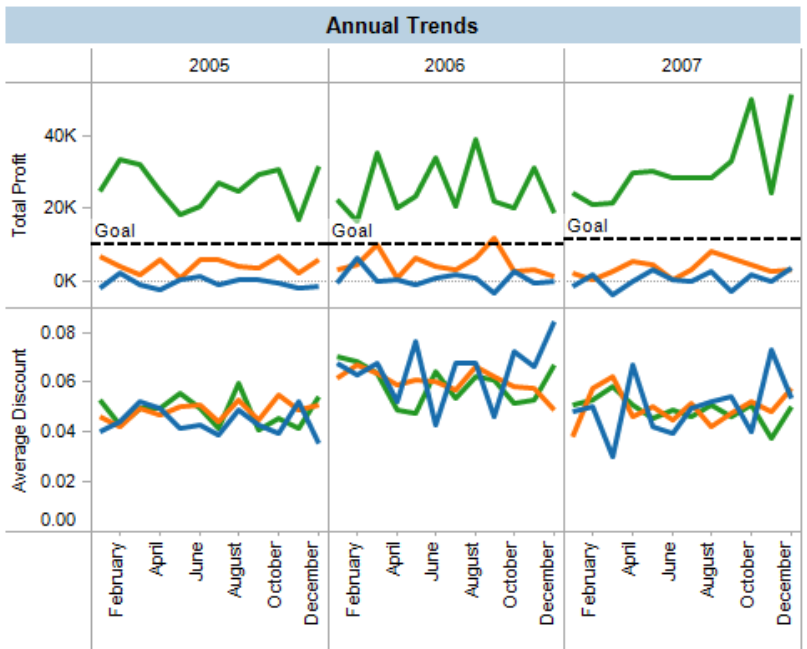
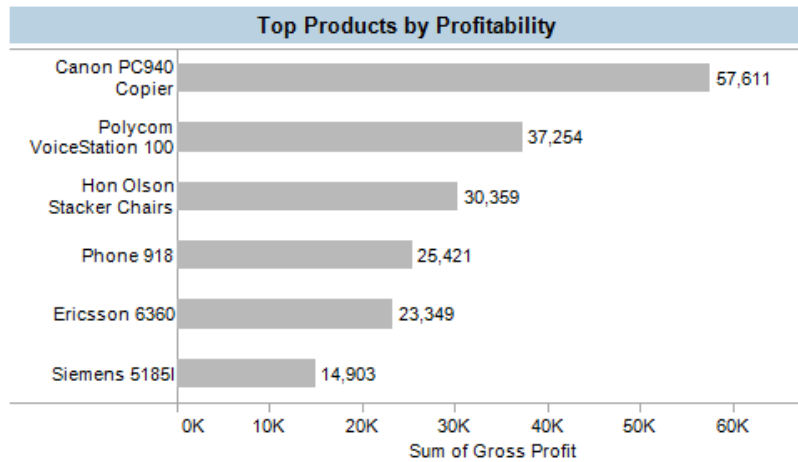
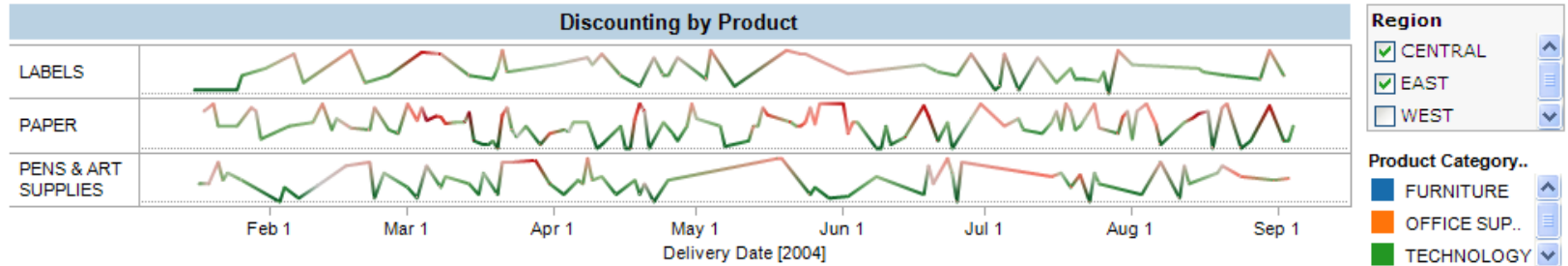
Region

Class change vs share change

MyShare change from Q3 to Q4

Spotfire Decision Site Posters

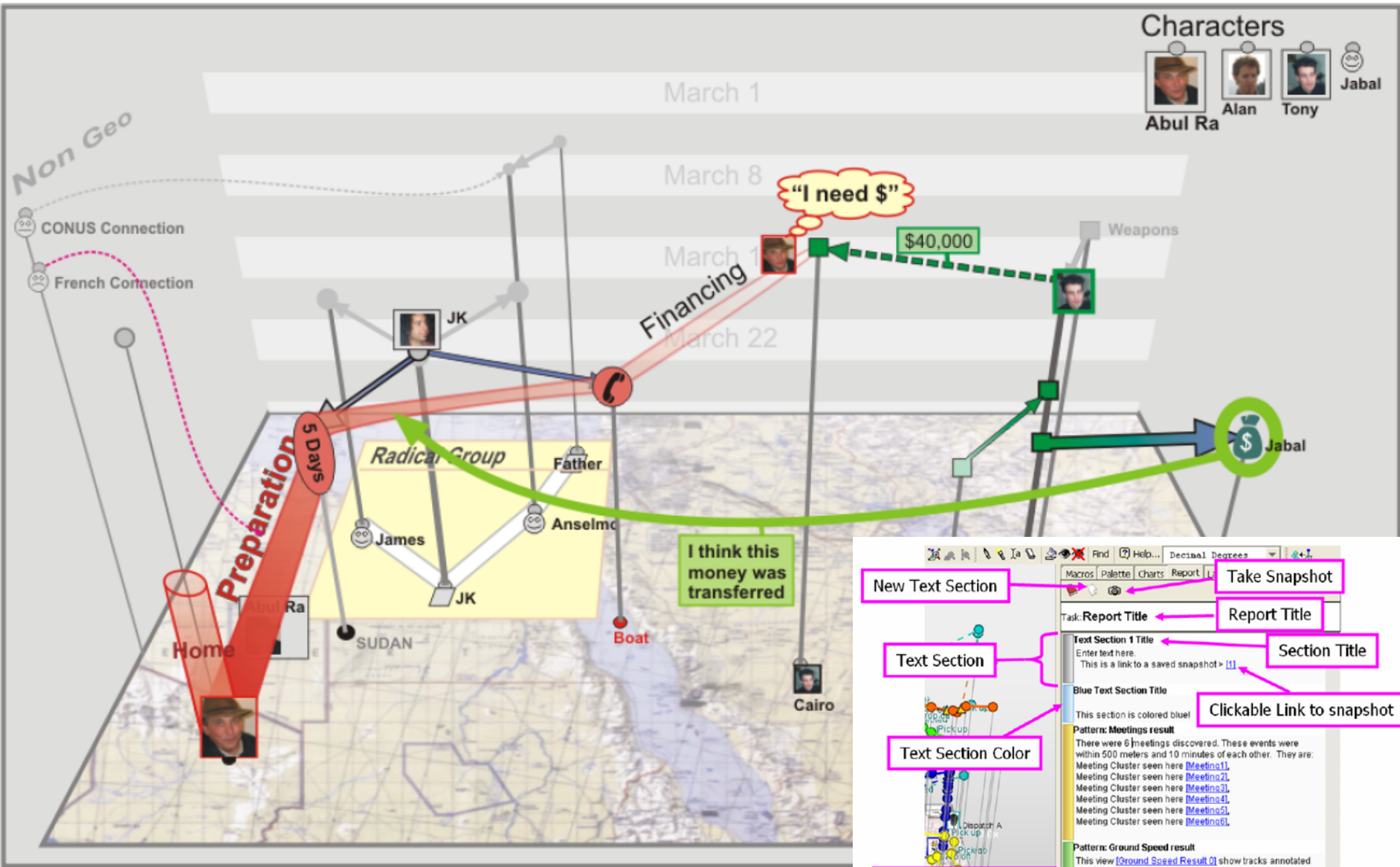
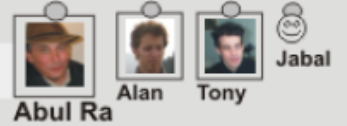
Analytic Dashboard



Summary by Year and Product Type

		2004	2005	2006	2007
FURNITURE	Total Discou..	13	5	7	5
	Total Profit	\$40.4K	(\$7.4K)	\$5.4K	\$3.2K
OFFICE SUPPLIES	Total Discou..	53	37	40	38
	Total Profit	\$70.6K	\$51.8K	\$56.1K	\$41.9K

Characters



New Text Section
Text Section
Text Section Color
Hide Sections by Color
Take Snapshot
Report Title
Section Title
Clickable Link to snapshot
Snapshot Preview Panel

Task: Report Title
Text Section 1 Title
Enter text here.
This is a link to a saved snapshot > [1]

Blue Text Section Title
This section is colored blue!

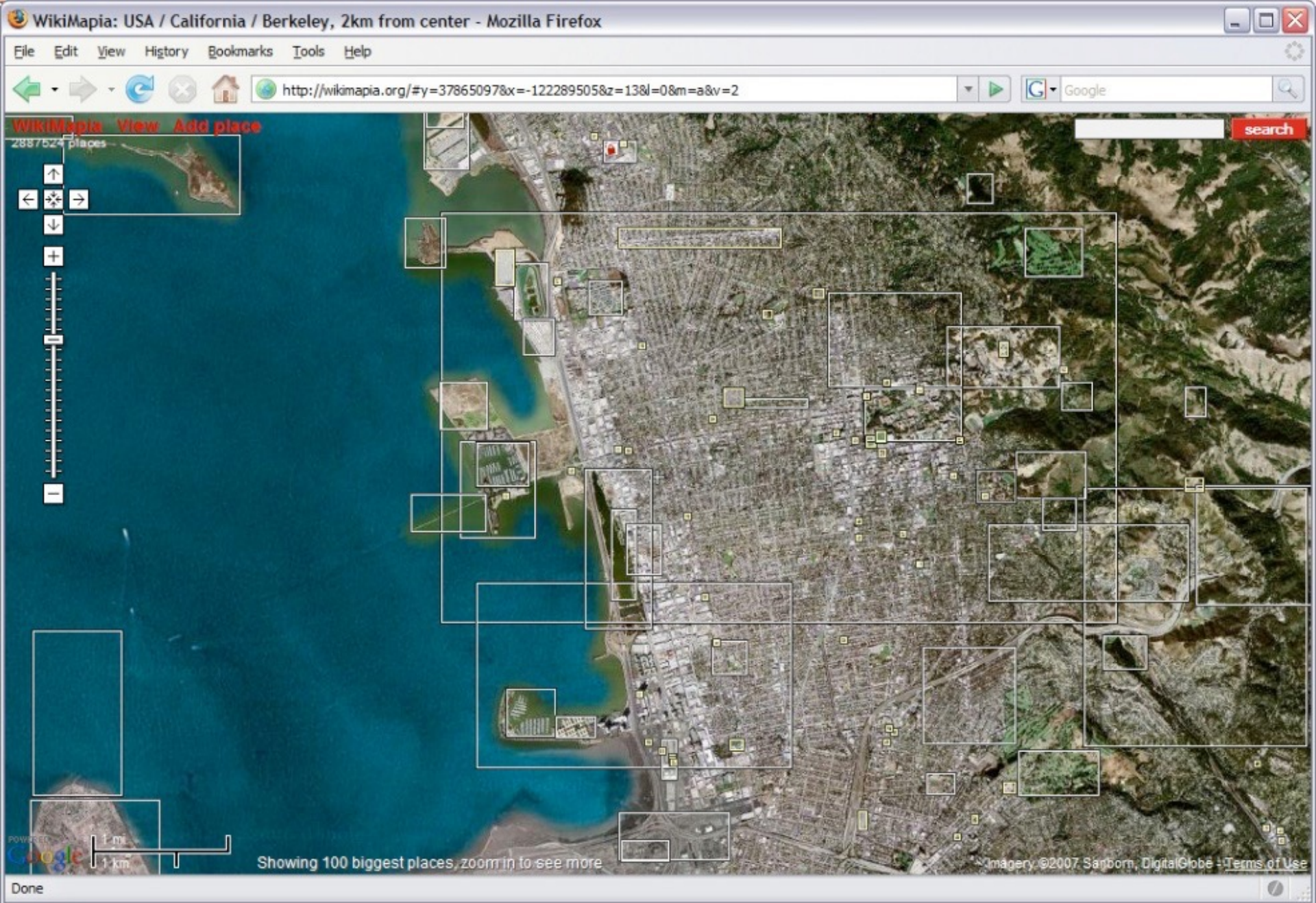
Pattern: Meetings result
There were 6 meetings discovered. These events were within 500 meters and 10 minutes of each other. They are:
Meeting Cluster seen here [Meeting1]
Meeting Cluster seen here [Meeting2]
Meeting Cluster seen here [Meeting3]
Meeting Cluster seen here [Meeting4]
Meeting Cluster seen here [Meeting5]
Meeting Cluster seen here [Meeting6]

Pattern: Ground Speed result
This view [Ground Speed Result 0] show tracks annotated with AVERAGE VELOCITY BETWEEN KNOWN POSITIONS. The color spectrum from white to red indicates velocity from 0 kph (white) to 100kph or higher (red).

Hide Sections: [Color palette]

[1] [Ground Speed R] [Meeting1] [Meeting2] [Mes

GeoTime Stories



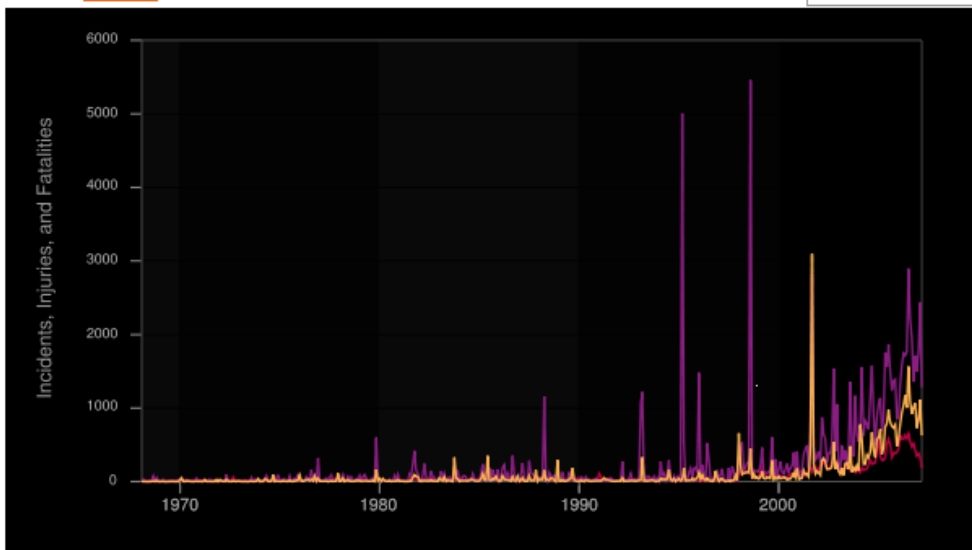
Wikimapia.org

The Status of George Bush's War on Terrorism

By [seema](#) on Feb 22, 2007
Viewed 8927 times

Graph Table Cloud Map Absolute Relative All 31y 21y 4y

> More Options



Bling Compare

Sources: MIPT Terrorism Knowledge Base (<http://www.terrorismknowled...>)

Incidents, injuries, and deaths from terrorism have increased during the new millenium. 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

Share this Graph

Send an Email

Post to Blog

11 diggs

Rate It

3 ratings
[Sign in to rate](#)

Like It

Feature It

Legend

Global Terrorist Incidents, 1968-2007

- Incidents
- Injuries
- Fatalities

[More >](#)

Tags

no tags yet

Community Tags

[Add tags](#)

no tags yet

Correlations

[See all](#)

89% [Injuries](#) and [Fatalities](#)

Related Graphs

[Yearly Terrorism Statistics](#)
Created By: [Dmitry](#)
Views: 2474

[Global Terrorism Incidents and Iraq Body Count](#)
Created By: [Dmitry](#)
Views: 1868

[Reported Maximum vs. The Status of George Bush's War on Terrorism](#)
Created By: [quest](#)
Views: 1192

[Reported Maximum vs. The Status of George Bush's War on Terrorism](#)
Created By: [quest](#)
Views: 1181

[Reported Maximum vs. The Status of George Bush's War on Terrorism](#)



data sets

search

Visualizations : Guantanamo Bay Detainees, release status & age

Can't see the visualization? Download the latest Java plugin [here](#). On Macs: best viewed in Safari.

Created by: [Martin Wattenberg](#) Created on: Saturday February 24, 12:06 PM

explore

- [visualizations](#)
- [data sets](#)
- [comments](#)
- [topic hubs](#)

participate

- [register](#)
- [create visualization](#)
- [upload data set](#)
- [create topic hub](#)

learn more

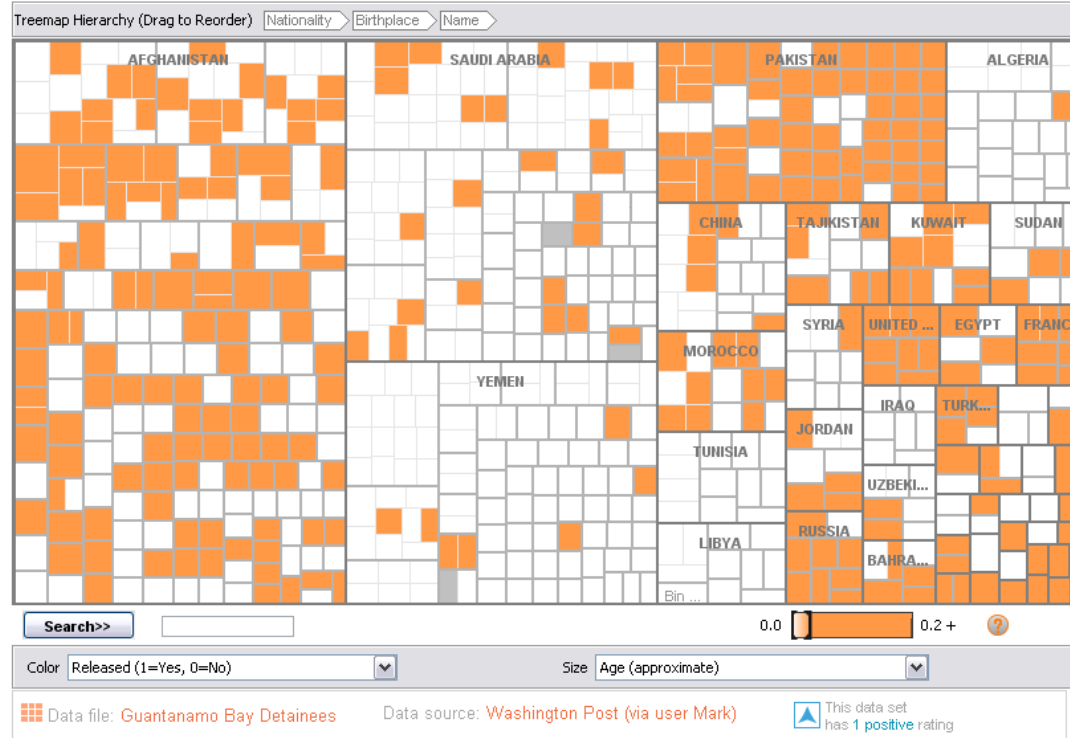
- [quick start](#)
- [visualization types](#)
- [data format & style](#)
- [about Many Eyes](#)
- [FAQ](#)
- [blog](#)

contact

- [contact us](#)
- [report a bug](#)

legal

- [terms of use](#)



- [share this](#)
- [watch this](#)
- [add to topic hub](#)
- [rate this](#)

Comments (4)

[Martin Wattenberg](#) says:
 In this view, orange means released, white means not released. Gray means committed suicide.
 Posted Saturday February 24, 12:07 PM
[see view for this comment](#)

[Martin Wattenberg](#) says:
 I'd be curious to hear ideas on why various countries have the release proportions that they do.
 Posted Saturday February 24, 12:13 PM
[see view for this comment](#)

[Mark](#) says:

This visualization has 1 positive rating

You can add this visualization to a topic hub! [Learn more.](#)

Want to keep track of this visualization? Add it to your watchlist!

Learn more:

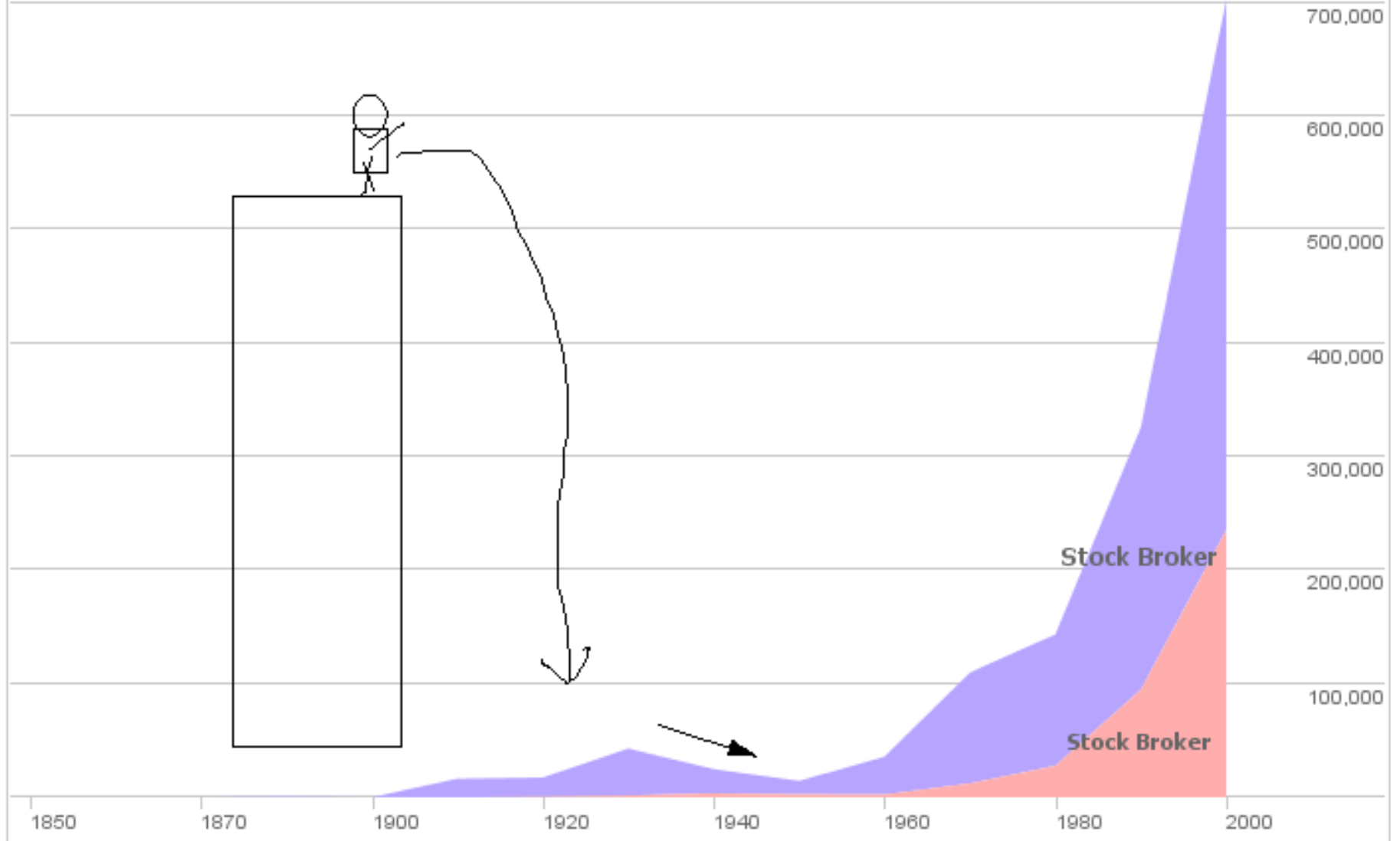
[About the Treemap](#)

Discussion

Great depression "killed" a lot of brokers

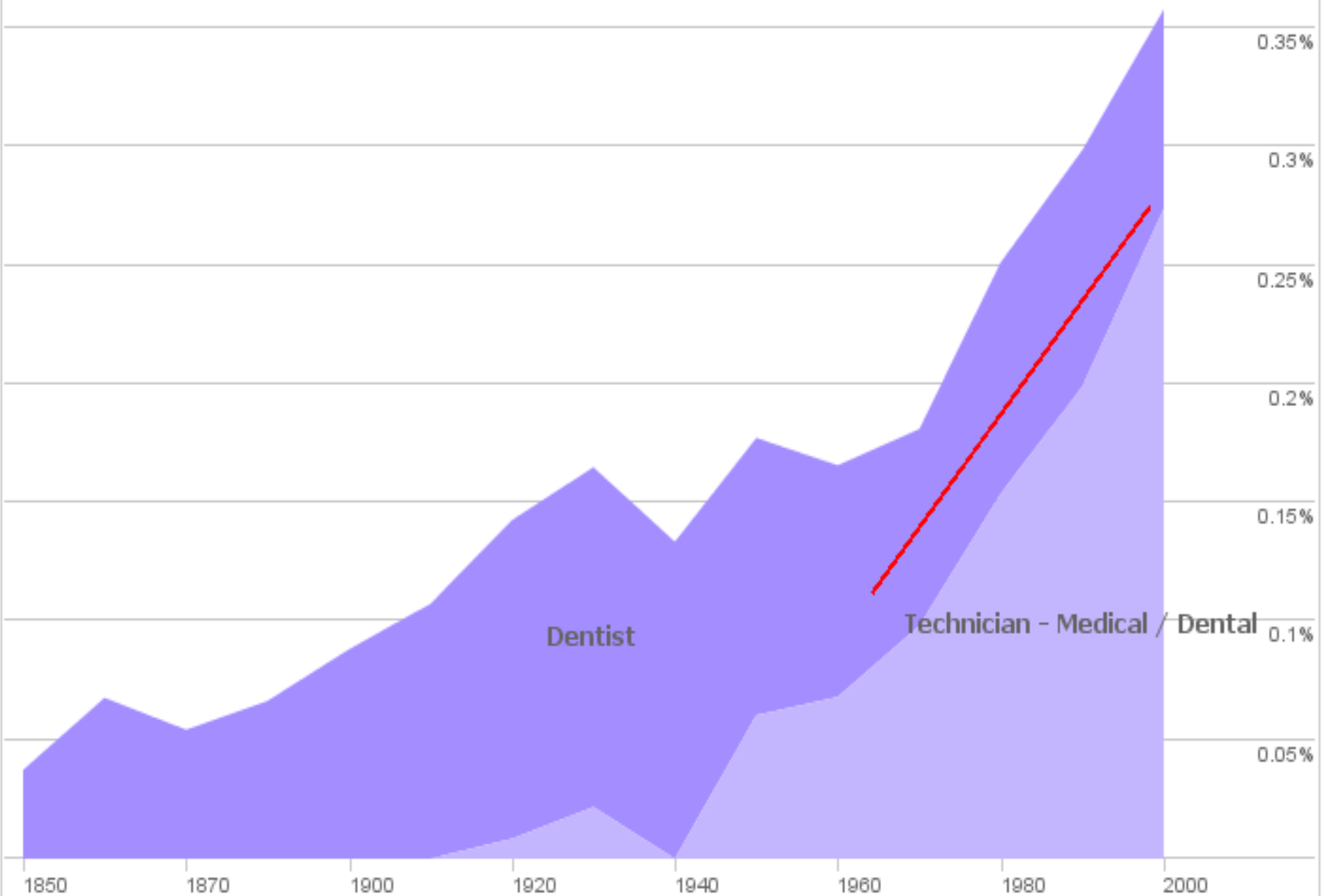
>> Stock Broker

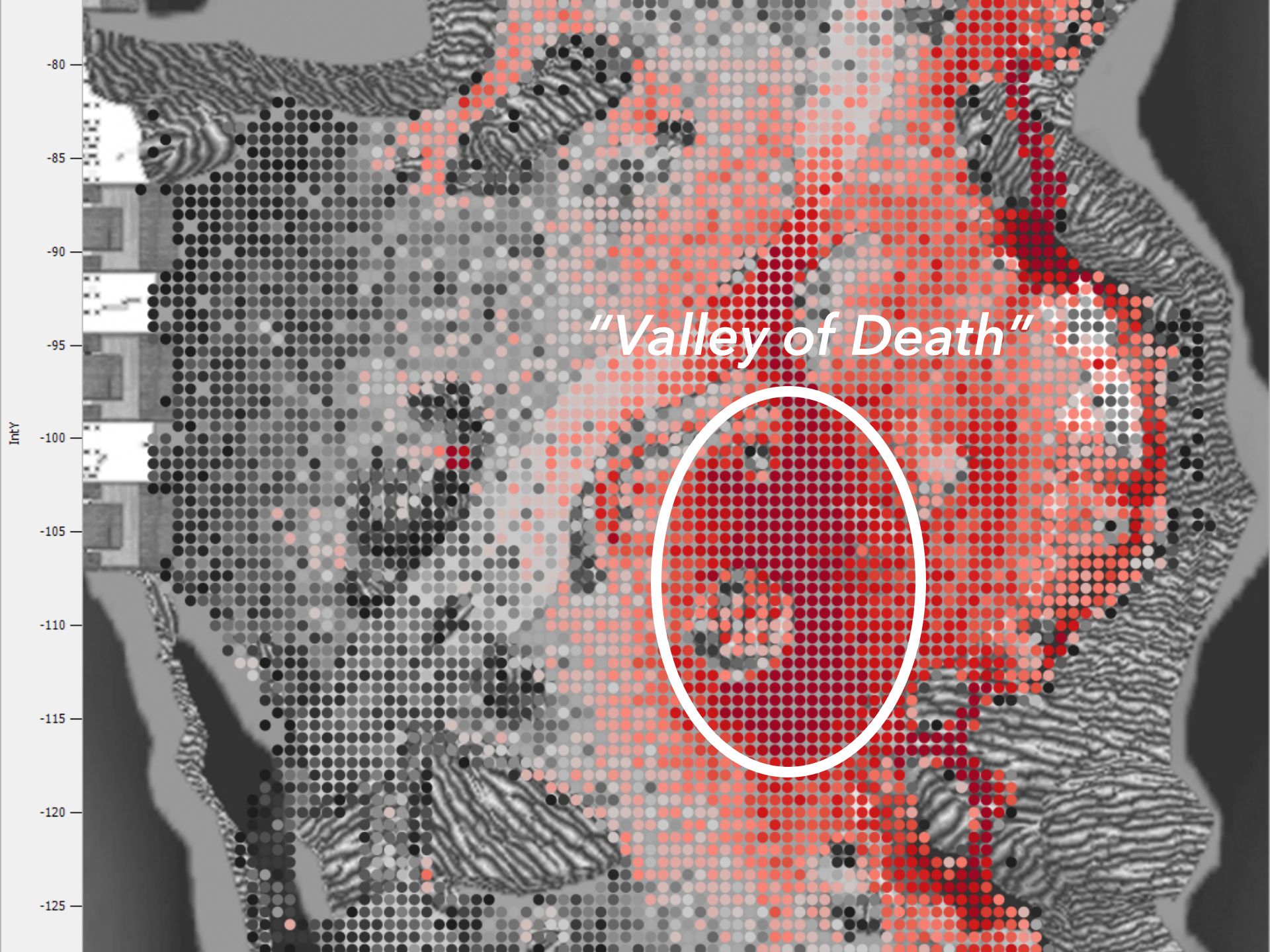
● all ● men ● women Total People Count ▾



>> dent

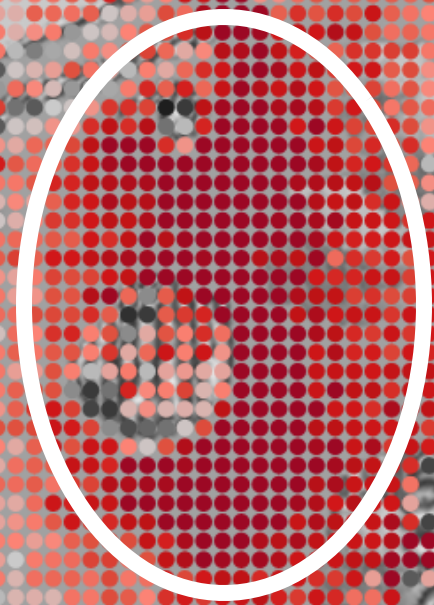
all men women % of Work Force ▾





-80
-85
-90
-95
-100
-105
-110
-115
-120
-125

"Valley of Death"





Visualizations: **Flawed Data** - Temp Over Time and CO2 Levels : This view shows the correlation between...

Creator: Bruce

Tags:

explore
visualizations
data sets
comments
topic hubs

participate
create visualization
upload data set
create topic hub
register

learn more
quick start
visualization types
data format & style
about Many Eyes
FAQ
blog

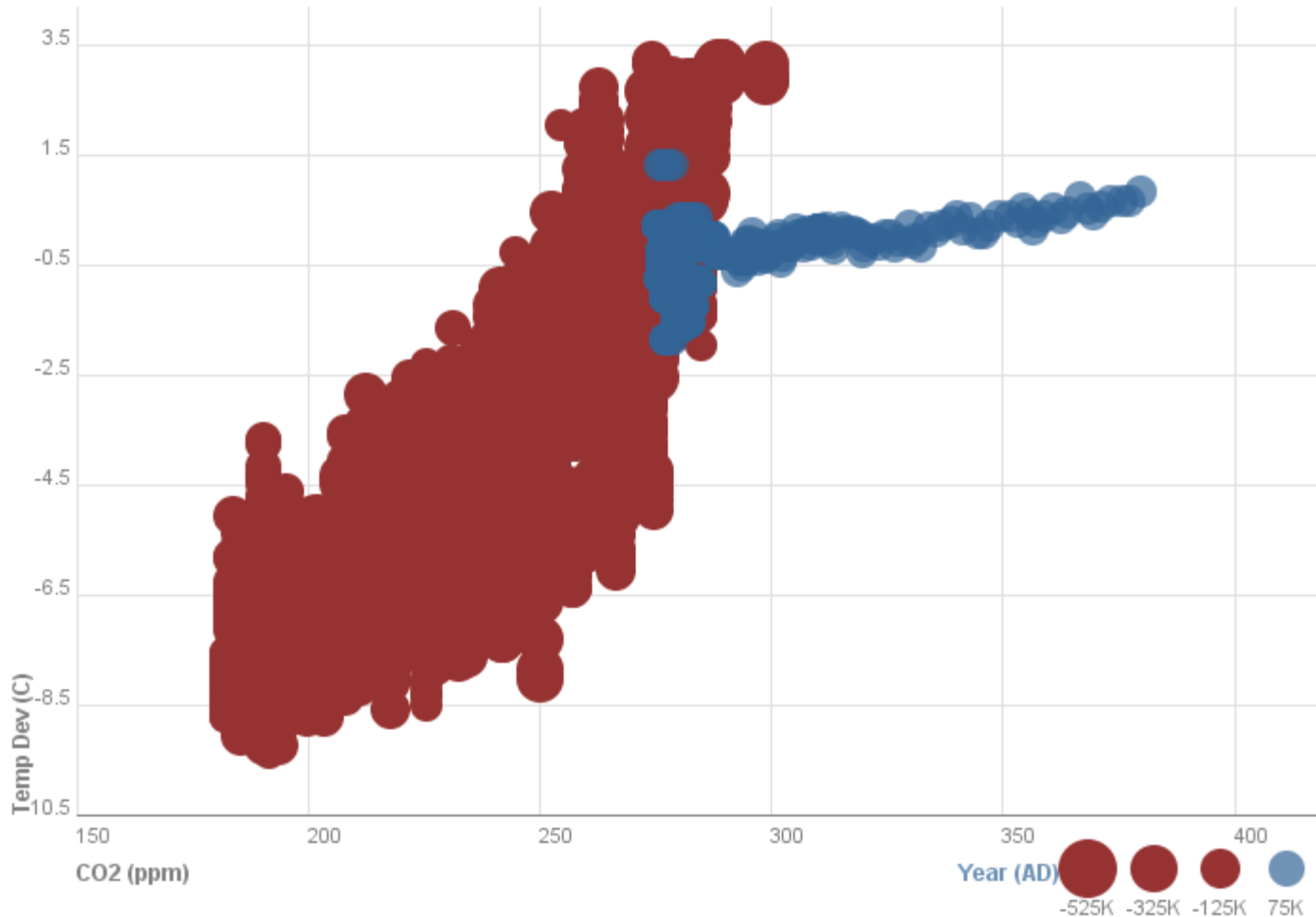
contact Us
contact
report a bug

legal
terms of use

Popular Dataset Tags

2007 2008 bible blo
books census crim
education eharmor
election energy fo
health inaugurati
internet ireland literatu
lyrics media mus
network oban
people politic
population
president prices religi
research SOCI
speech state stati
statistics supply-cha
survey text US web world

See More



X Axis Y Axis Dot Size

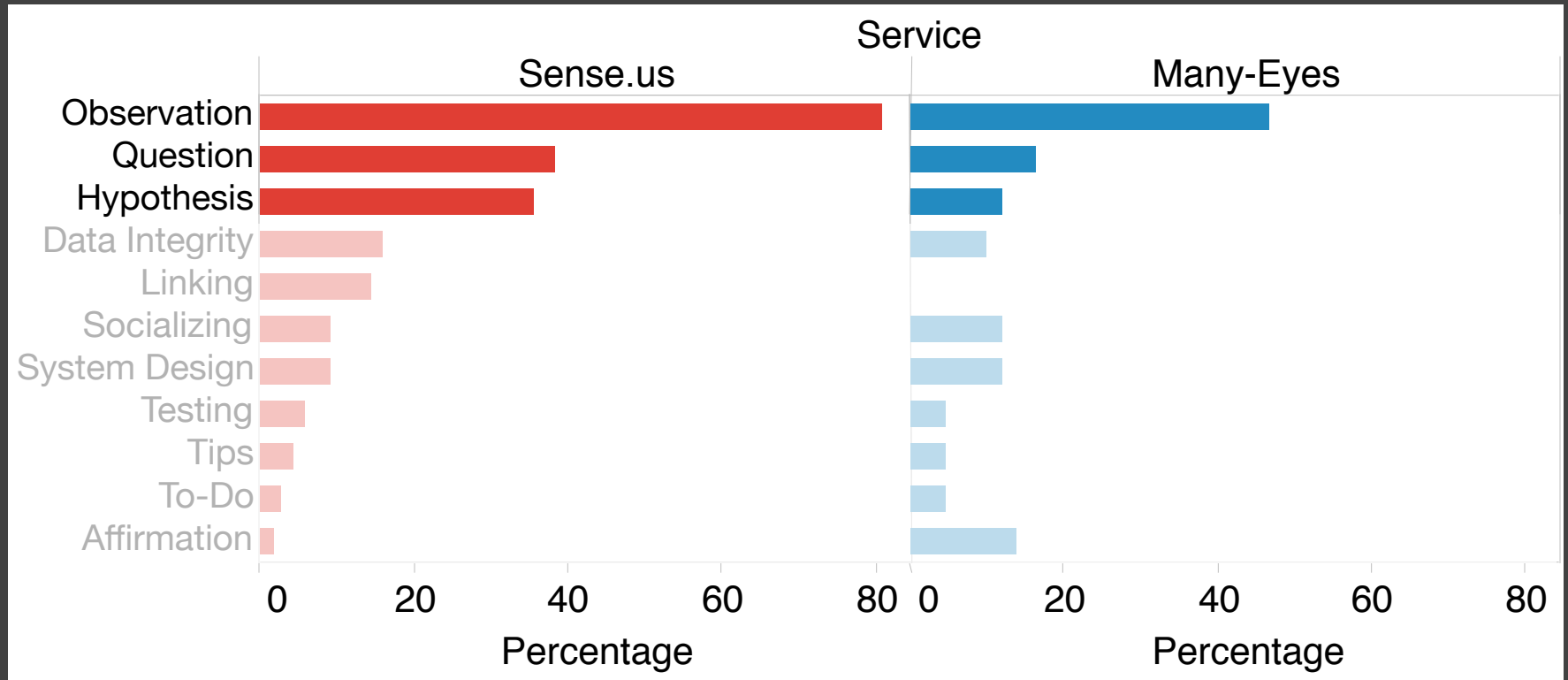
years cluster. What does this mean though that such high CO2 levels are preceding significant changes in temperature? Something, much worse is yet to come?

Posted Monday January 20 2007, 09:32 AM
see view for this comment

experienced numerous times in the 4+ billion year history of the planet.

Posted Friday February 09 2007, 03:45 PM
see view for this comment

Content Analysis of Comments



Feature prevalence from content analysis (min Cohen's $\kappa = .74$)
High co-occurrence of Observation, Question, and Hypothesis

Sharing in External Media

dogear Social Bookmarking for IBM

Cambridge, MA

Blue Pages Bluepages+1 Blog Central Send Email

Now Viewing sense.us

TAGS PEOPLE SUBS

Active Tags

MORE LESS

2.0 ajax appdiag application_development architecture articles blog blogging Cisco collaboration component_designer connections design dogear-nation Domino enterprise2.0 Firefox_and_Mozilla_Links hr ibm IBM innovation ITLMC java javascript kcp learning lotus Lotus management mashup m&e microsoft portal Rational research Sametime sametime secondlife security social-software software standards tools travel ursocialcomputing video vista visualization web Web web2.0 websphere wiki windows wps 家電 新聞 製造

All | Active | My Bookmarks | My Subscriptions Settings | Help | Feedback | Logout

sense.us All Bookmarks Search

all bookmarks matching "sense.us"

1 - 10 of 66 1 | 2 | 3 | 4 | 5 | OLDEST» «NEWER | OLDER»

sense.us visualization
COPY | 23 Jan 2007 |

sense.us > dogear_tags dogear_tags visualization
COPY | 08 Sep 2006 | and 6 others
visualization by sense.us of dogear_tags

sense.us > social data visualization collaboration visualization
COPY | 08 Sep 2006 | and 30 others
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.

Asian-born as % of U.S. population: sense.us visualization demographics sense.us visualization
COPY | 01 Sep 2006 |
Places of birth, over time, for Asian-born respondents in U.S. census.

Art trumps science in dogear? dogear sense.us tagging visualization
COPY | 07 Sep 2006 |
From the sense.us visualization site... May be an artifact, but there are a suprisingly large number of art-related tags on dogear!

sense.us > dogear_people dogear infoviz socialsoftware visualization
COPY | 06 Sep 2006 | and 4 others

Aak, Texas sense.us texas visualization
COPY | 07 Sep 2006 |
The Texans are taking over... texas!

sense.us > dogear_tags : sametime dogear many-eyes viz
COPY | 06 Sep 2006 | and 1 other



sense.us > birthplace :region=Asia asia many-eyes viz
COPY | 06 Sep 2006 |



African immigration africa sense.us visualization
COPY | 06 Sep 2006 |
A dramatic rise in African immigration to the U.S.

dogear Social Bookmarking for IBM

Cambridge, MA

Blue Pages Bluepages+1 Blog Central Send Email

Now Viewing sense.us

TAGS PEOPLE SUBS

Active Tags

MORE LESS

2.0 ajax appdiag application_development architecture articles blog blogging Cisco collaboration component_designer connections design dogear-nation Domino enterprise2.0 Firefox_and_Mozilla_Links hr ibm IBM innovation ITLMC java avascript kcp learning lotus .otus management mashup n&e microsoft portal Rational research Sametime sametime secondlife security social-software software standards tools travel /rsocialcomputing video vista /rsualization web Web web2.0 websphere wiki windows wps 家電 新聞 製造

All | Active | My Bookmarks | My Subscriptions Settings | Help | Feedback | Logout

sense.us All Bookmarks Search

all bookmarks matching "sense.us"

11 - 20 of 66 «NEWEST | 1 | 2 | 3 | 4 | 5 | OLDEST» «NEWER | OLDER»

African immigration africa sense.us visualization
COPY | 06 Sep 2006 |
A dramatic rise in African immigration to the U.S.

School & Poverty demographics sense.us visualization
COPY | 07 Sep 2006 |
College is clearly a cause of poverty, at least in the short term! sense.us.

sense.us > dogear_tags atom rss tagging
COPY | 08 Sep 2006 |
atom is gaining on rss in dogear!!

Visualization of people on dogear dogear sense.us visualization
COPY | 06 Sep 2006 |
See who has been posting the most to dogear... you can even compare people side by side!

sense.us > dogear_tags : ict | sametime7 ict many-eyes sametime viz
COPY | 06 Sep 2006 |



"personal" usage of dogear decreasing? dogear sense.us tags visualization
COPY | 07 Sep 2006 |
It seems like a decreasing percentage of dogear items are marked "personal." What does this mean?

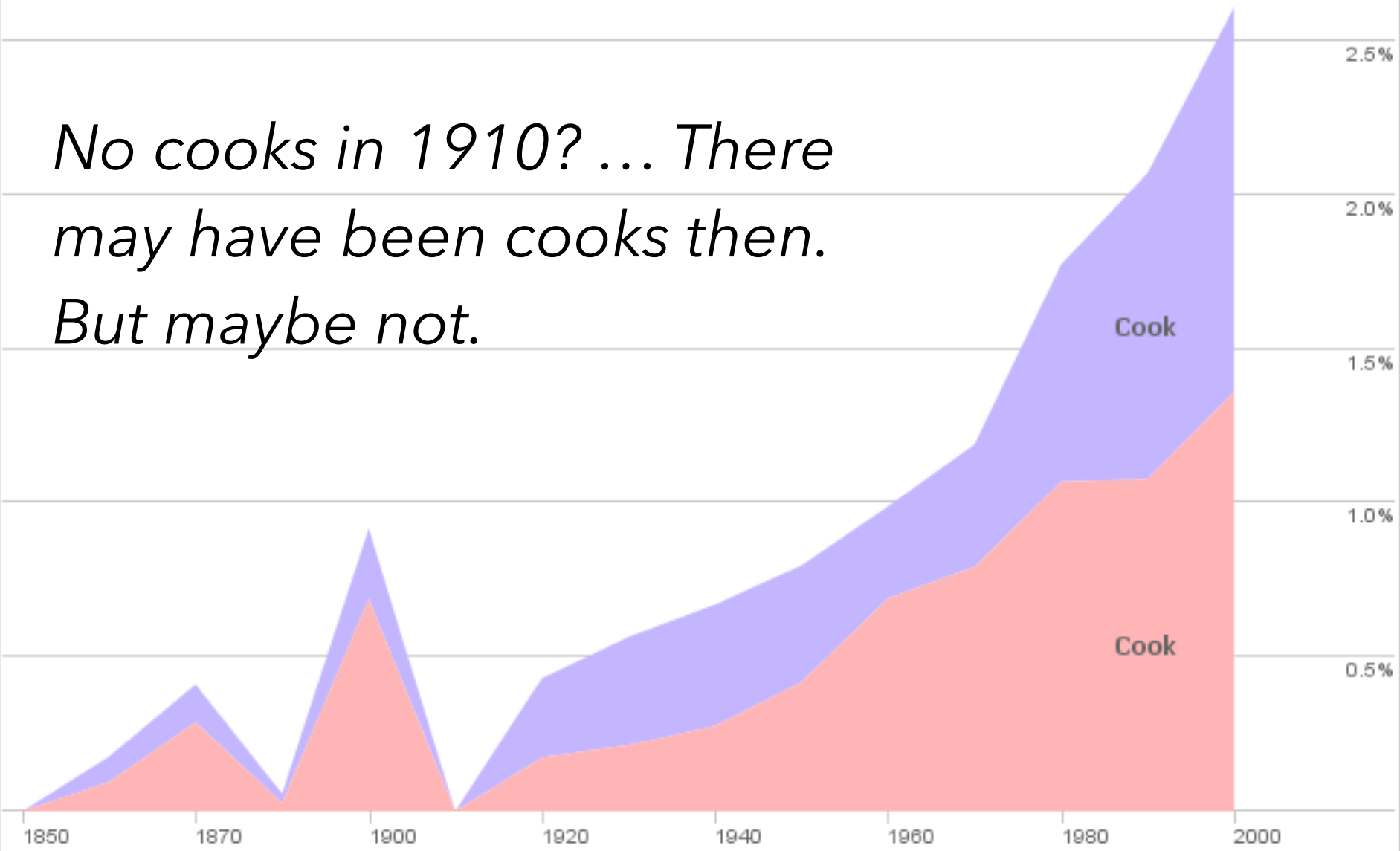
Children and household size Children sense.us visualization
COPY | 07 Sep 2006 |
There's an unexpected inverse relationship between # children under five and total household size. I wonder what's going on?
children

The one shrinking state of the union sense.us us visualization
COPY | 07 Sep 2006 |
What is the one U.S. whose population is decreasing?
u.s map

Florida was obvious, but the others? demographics sense.us visualization
COPY | 07 Sep 2006 |
Florida has a high proportion of senior citizens, sure. But some of the other extremes on the map are surprising.
senior citizen map

Data Quality

No cooks in 1910? ... There may have been cooks then. But maybe not.



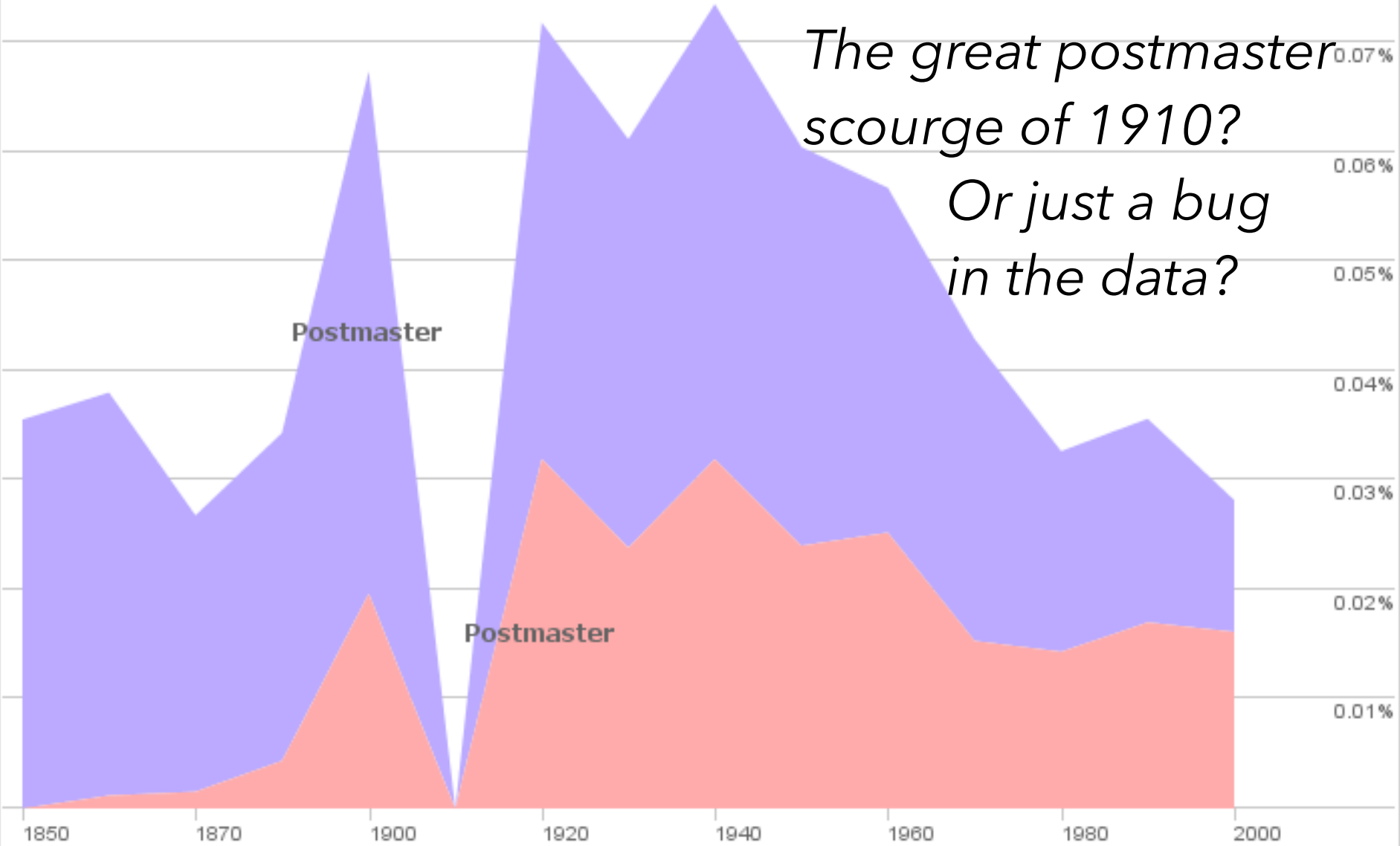
>> post

● all ● men ● women % of Work Force ▾

*The great postmaster
scourge of 1910?
Or just a bug
in the data?*

Postmaster

Postmaster



Annotate



Stroke



Fill



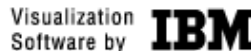
Sans-Serif

14

B

I

- Overview
- Visualizations**
- Data Sets
- Topics
- My Lab
- About Visualization Lab
- Help



Independents by Religious Tradition

Created by The New York Times

[Browse All Visualizations »](#)

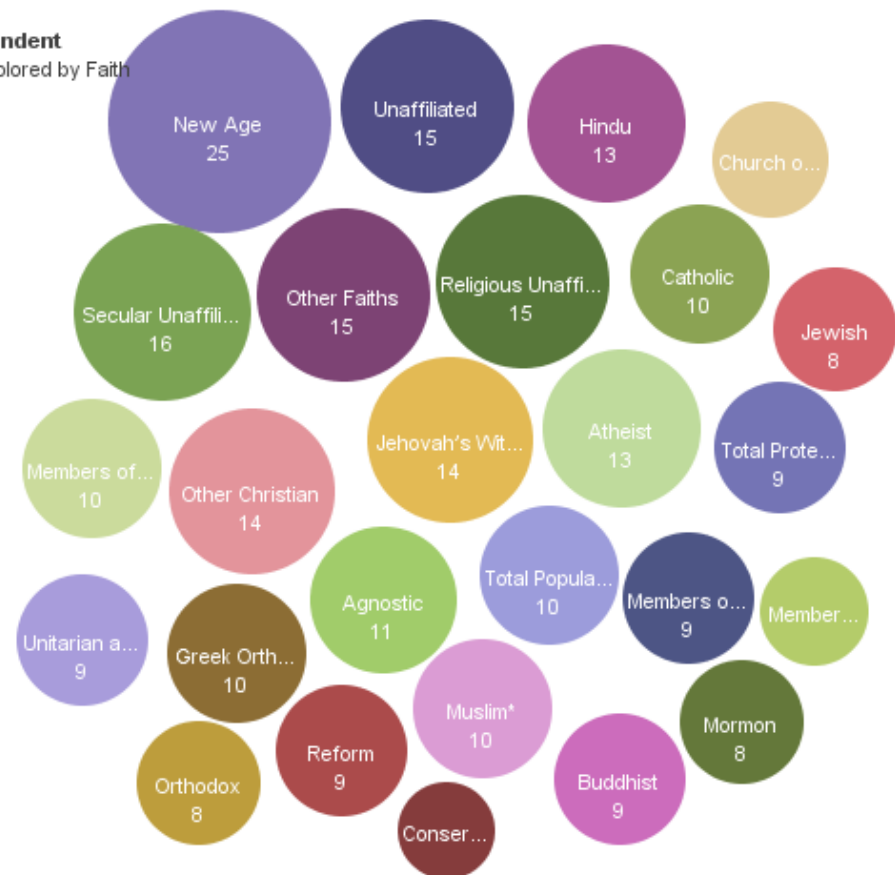
Faith

Click to select,
Ctrl-Click: multiple
Shift-Click: range

- Total Population
- Total Protestants
- Members of Evang. Prot. Cl...
- Members of Mainline Prot. C...
- Members of Hist. Black Prot...
- Catholic
- Mormon
- Church of Jesus Christ of La...
- Jehovah's Witness
- Orthodox
- Greek Orthodox
- Other Christian
- Jewish
- Reform
- Conservative
- Muslim*
- Buddhist
- Hindu
- Other Faiths
- Unitarian and Other Liberal

Independent

Disks colored by Faith



To highlight or find totals
click or ctrl-click.

- WORLD
- U.S.
- N.Y. REGION
- BUSINESS
- TECHNOLOGY
- SCIENCE
- HEALTH
- SPORTS
- OPINION
- ARTS
- STYLE
- TRAVEL
- JOBS**
- REAL ESTATE
- AUTOS

Visualizations

- Overview
- Visualizations**
- Data Sets
- Topics
- My Lab
- About Visualization Lab
- Help

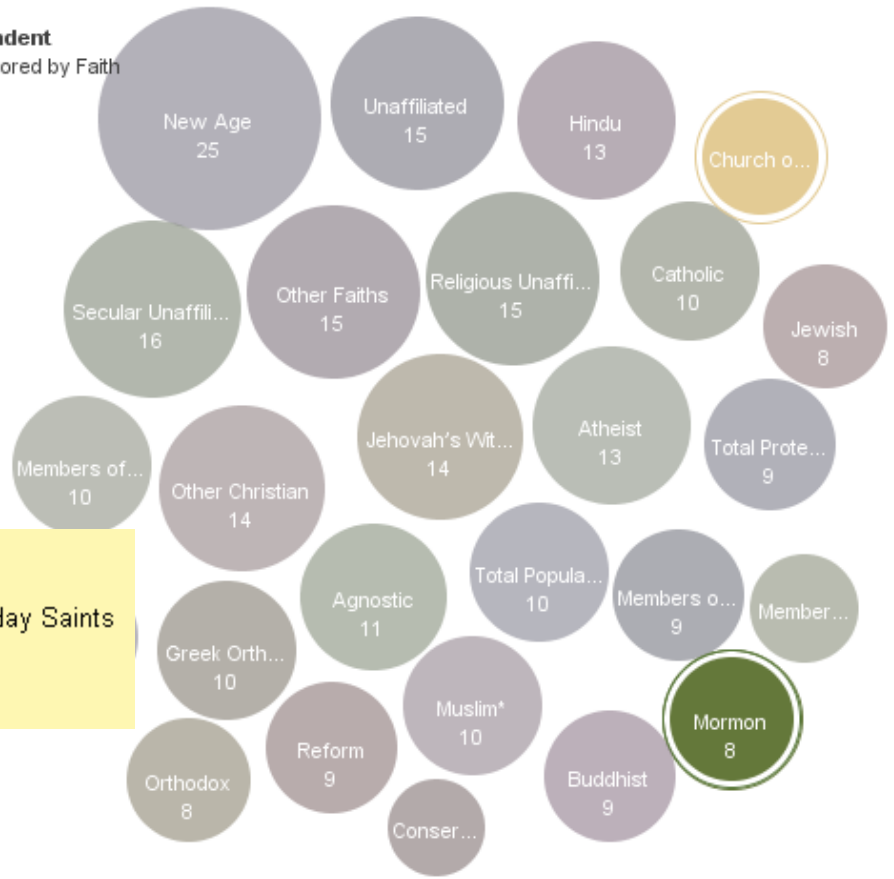
Independents by Religious Tradition > Um, I believe Church of Jesus...

Created by The New York Times

[Browse All Visualizations >](#)

- Faith**
Click to select,
Ctrl-Click: multiple
Shift-Click: range
- Total Population
 - Total Protestants
 - Members of Evang. Prot. Cl...
 - Members of Mainline Prot. C...
 - Members of Hist. Black Prot...
 - Catholic
 - Mormon
 - Church of Jesus Christ of La...
 - Jehovah's Witness
 - Orthodox
 - Greek Orthodox

Independent
Disks colored by Faith



Visualization Software by **IBM**

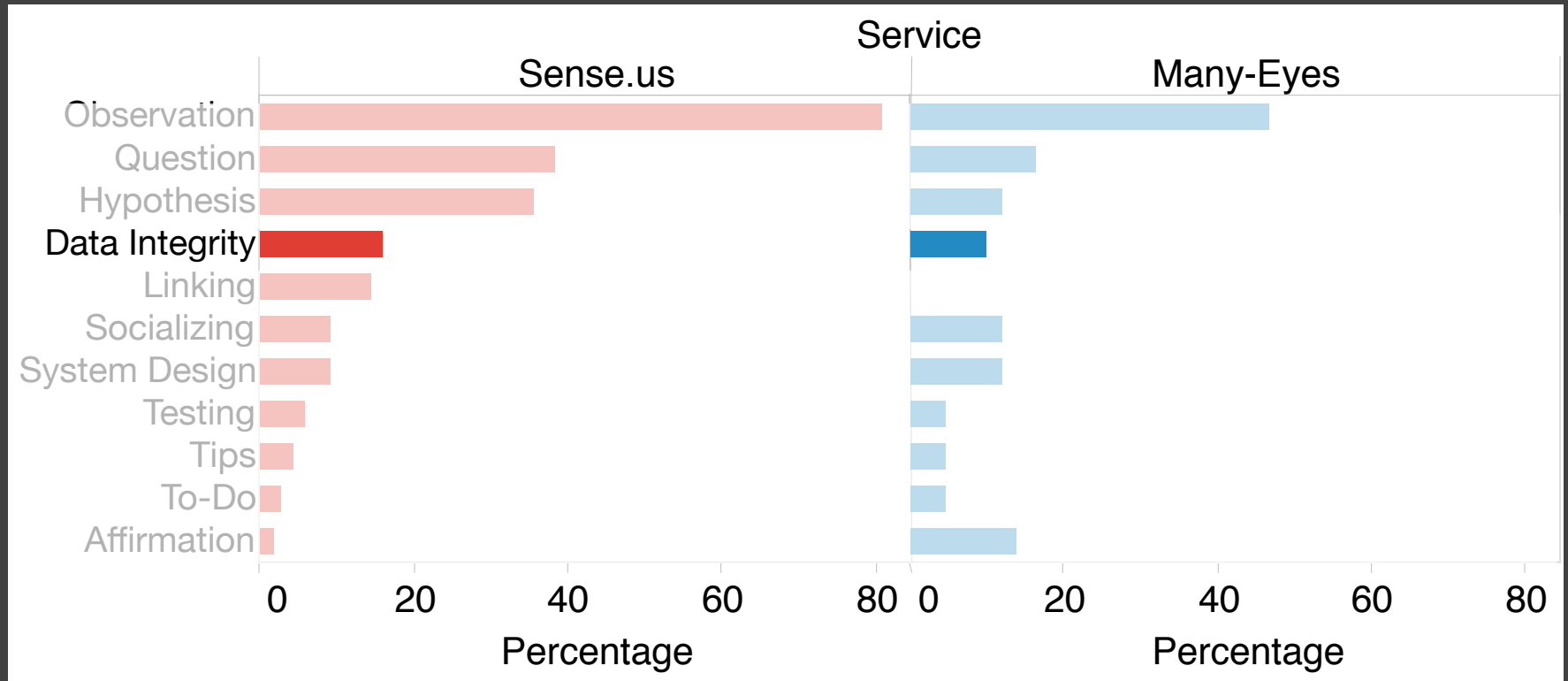
Anonymous says:
Um, I believe Church of Jesus Christ of Latter-day Saints and Mormon are the same?

- Buddhist
- Hindu
- Other Faiths
- Unitarian and Other Liberal

Highlighted: 1 item and 2 categories
total: 15 = 5%

Bubble Size Color

Content Analysis of Comments

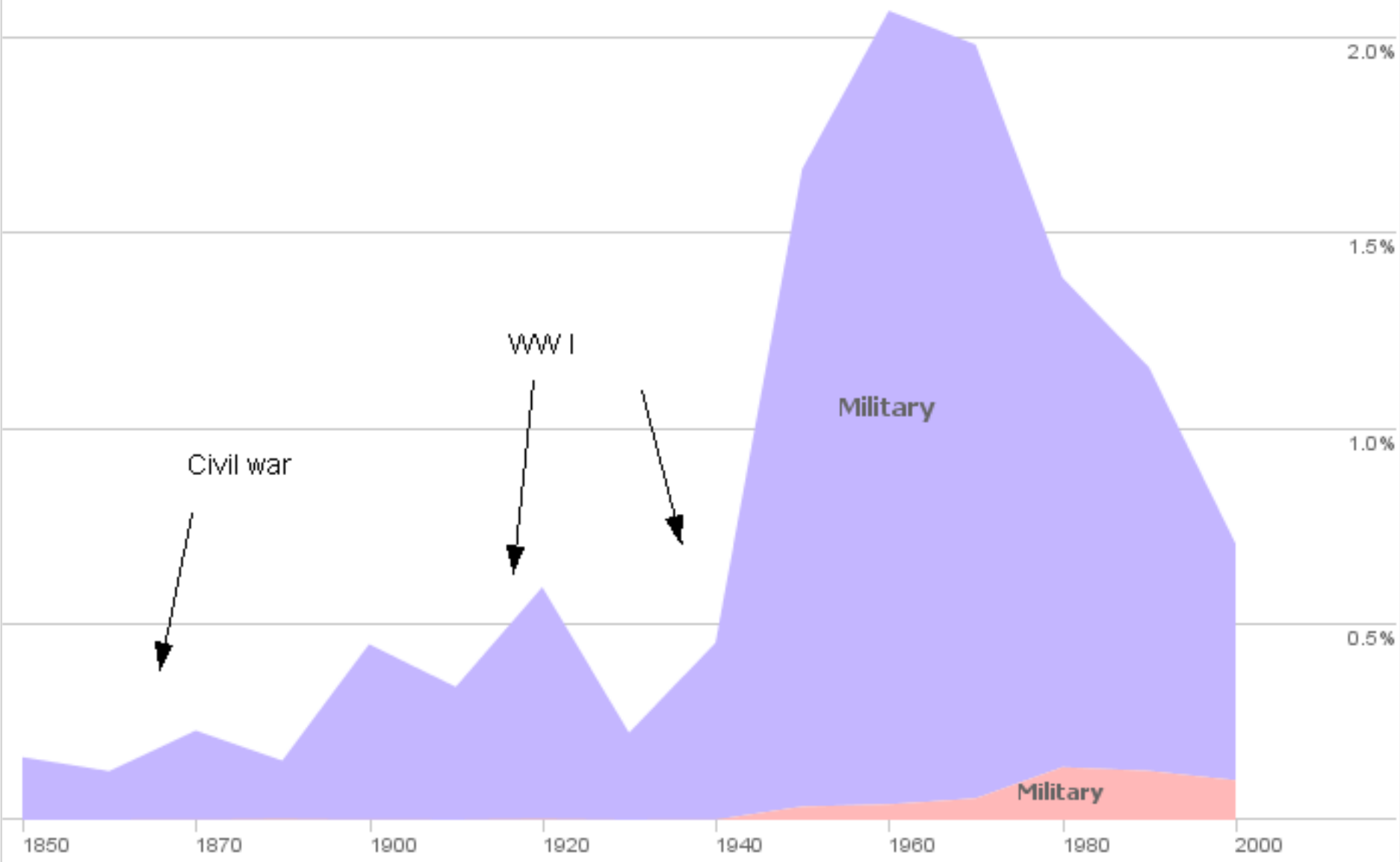


16% of sense.us comments and **10%** of Many-Eyes comments reference *data integrity* issues.

Data Integration *In Situ*

>> mili

● all ○ men ○ women % of Work Force ▼

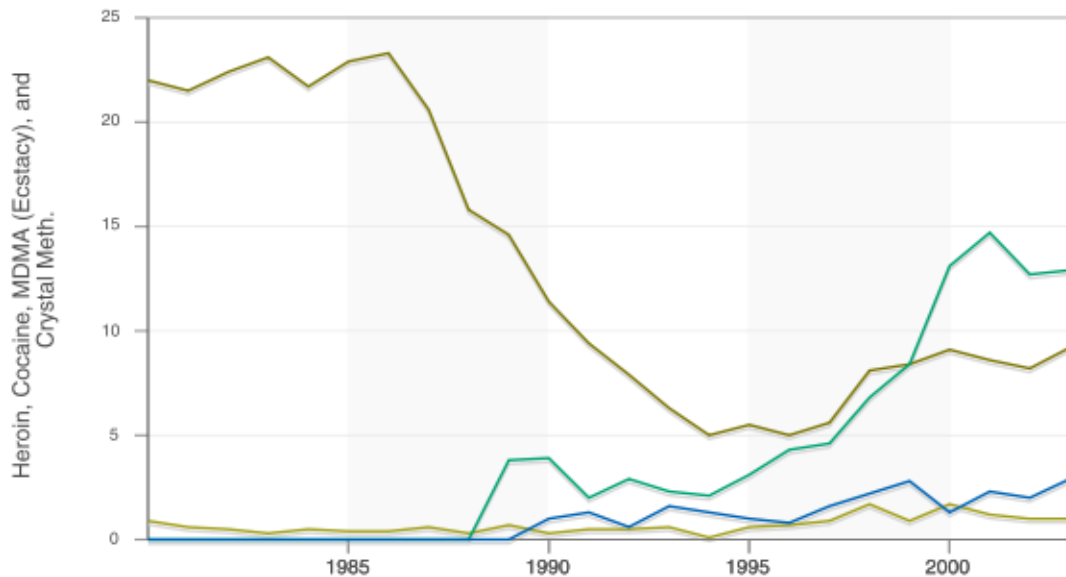


Heroin vs. Cocaine vs. MDMA (Ecstasy) vs. Crystal Meth.



By [quest](#) on Dec 19, 2006
Viewed 20481 times

Graph Table Map Absolute Relative All 23y 17y 8y More Options



Bling Compare

Sources: University of Michigan

Comments (1 - 20 of 32)



`<script src='http:' />jonny12</script>` says
jonny15
posted about 1 year ago



Anonymous says
Where's the pot?

Share this Graph

Send an Email

Post to Blog

Digg

Rate It

3 ratings

Swivel Business

Have you tried [Swivel Business?](#)

Legend

- [College Student Drug Use](#)
- [MDMA \(Ecstasy\)](#)
- [Cocaine](#)
- [Heroin](#)
- [Crystal Meth.](#)

[More >](#)

Tags

no tags yet

Community Tags

[Add tags](#)

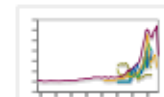
no tags yet

Correlations

[See all](#)

81% [MDMA \(Ecstasy\)](#) and [Crystal Meth.](#)

Related Graphs

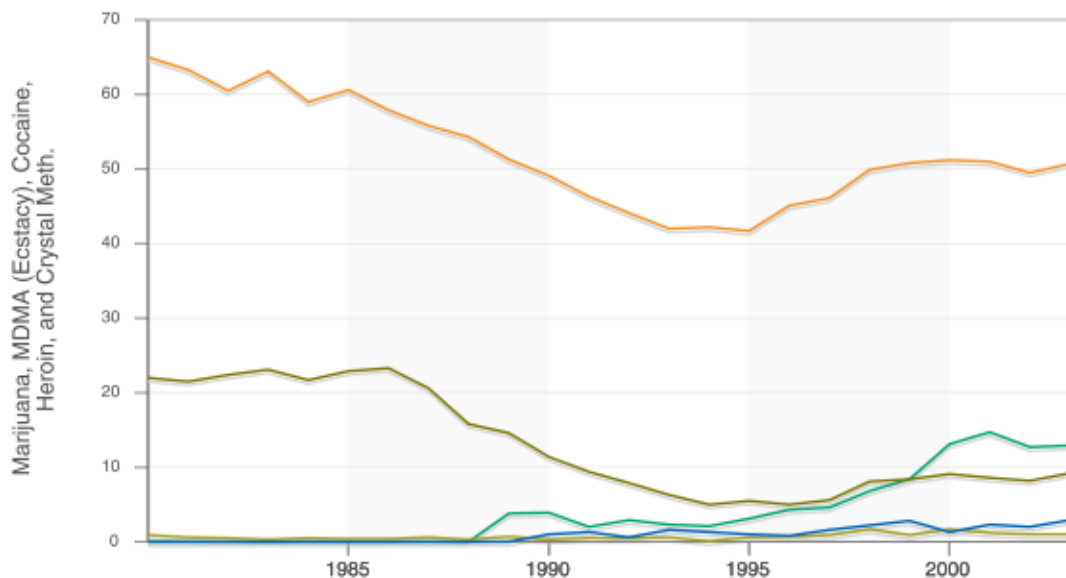


[Heroin vs. Cocaine vs. MDMA \(Ecstasy\) vs. Crystal Meth. vs. Heroin vs. Cocaine vs. MDMA \(Ecstasy\) vs. Crystal Meth. vs. Cocaine, NASDAQ Adjusted Close, and Dow Jones Industrial Average Adjusted Close](#)

Marijuana vs. Heroin vs. Cocaine vs. MDMA (Ecstasy) vs. Crystal Meth.

By [quest](#) on Mar 12, 2007
Viewed 25401 times

Graph Table Map Absolute Relative All 23y 17y 8y **>** More Options



Bling Compare

Sources: University of Michigan

Comments (17)

[visnu](#) says
pot pot pot pot
weed weed weed weed
posted about 1 year ago

[MARTY](#) says

Swivel Business

Have you tried [Swivel Business?](#)

Legend

- [College Student Drug Use](#)
- [Marijuana](#)
- [MDMA \(Ecstasy\)](#)
- [Cocaine](#)
- [Heroin](#)
- [Crystal Meth.](#)

[More >](#)

Tags

no tags yet

Community Tags

[Add tags](#)

no tags yet

Correlations

[See all](#)

93% [Marijuana](#) and [Cocaine](#)

Related Graphs

- [Heroin vs. Cocaine vs. MDMA \(Ecstasy\) vs. Crystal Meth. vs. Heroin vs. Cocaine vs. MDMA \(Ecstasy\) vs. Crystal Meth. vs. Cocaine, NASDAQ Adjusted Close, and Dow](#)

Share this Graph

[Send an Email](#)

[Post to Blog](#)

Digg

Rate It

0 ratings

What factors enable
viable collaborations?

How might we design
systems to facilitate
social data analysis?

Administrivia

Final Project

Poster Presentations

Session is **Mon Jun 8 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 11**, by **8am**, posted to GitHub

4-6 pages in ACM or IEEE TVCG format

Design Considerations for Collaborative Analysis

Modules of Contributions

Data Management

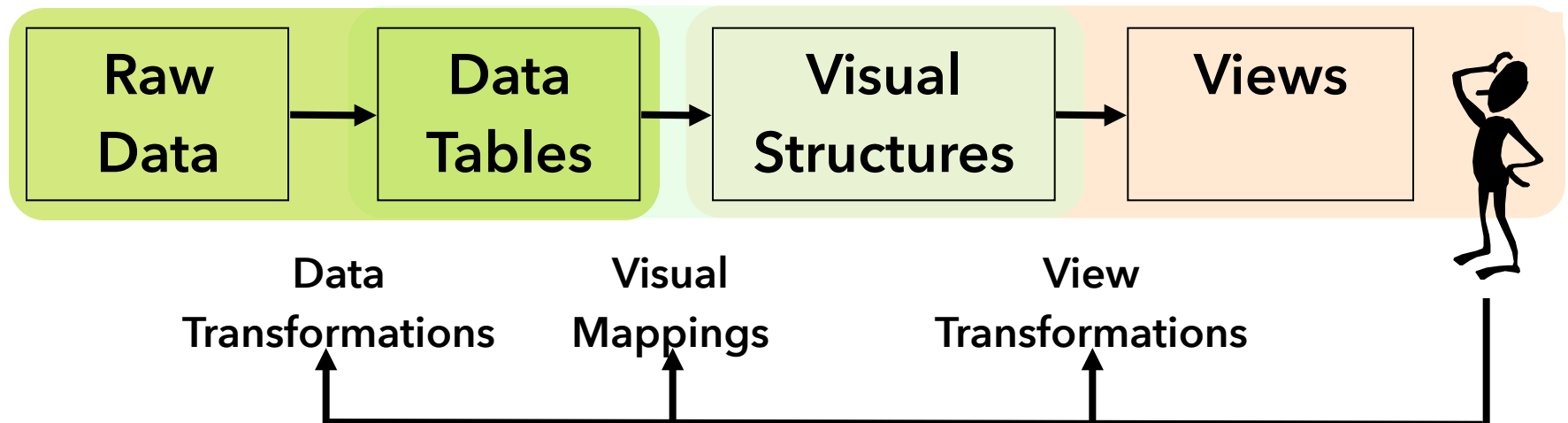
- Contribute Data
- Clean Data
- Categorize Data
- Moderate Data
- Create Metadata

Visualization

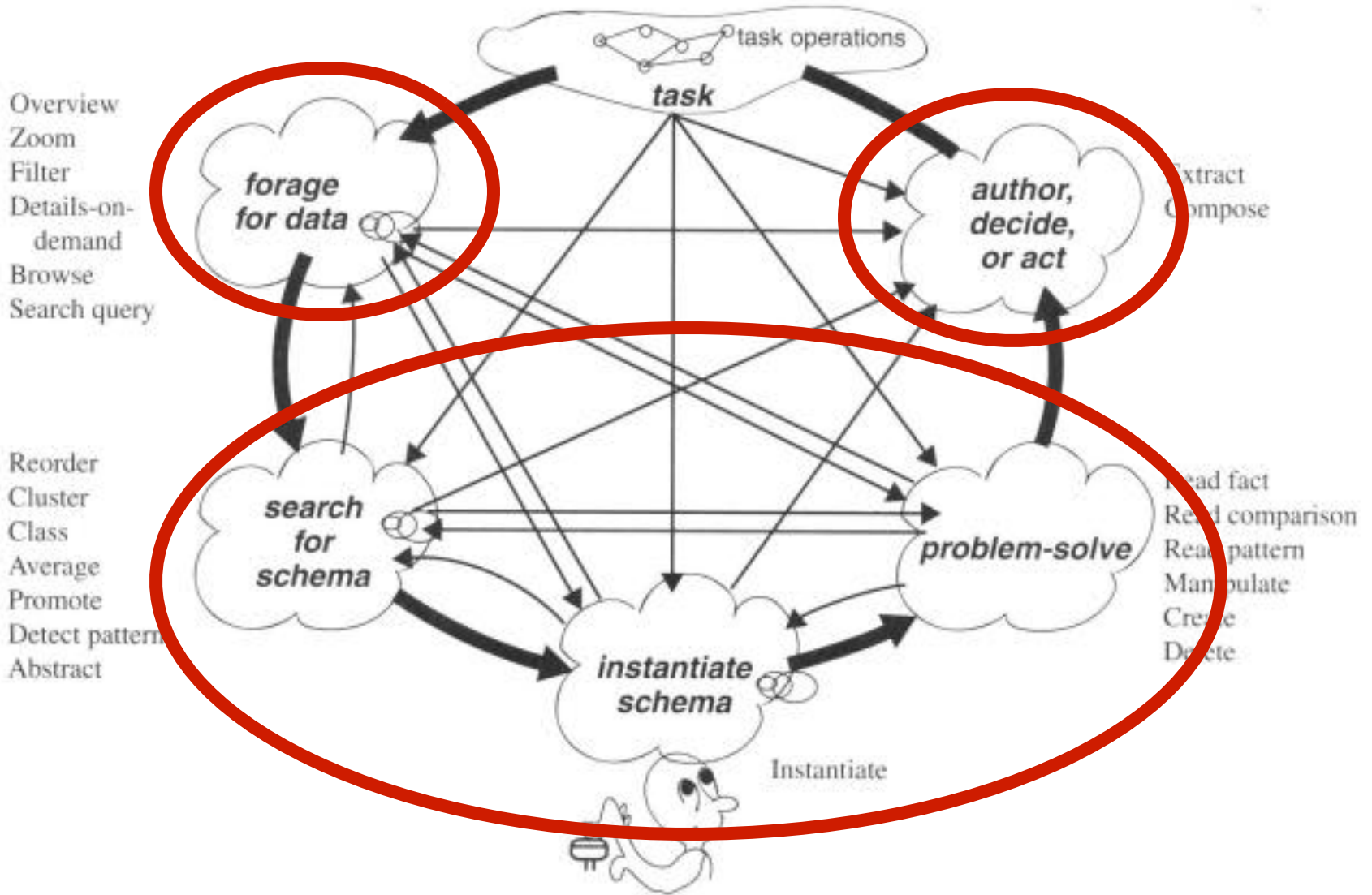
- Select Data Sources
- Apply Visual Encoding
- Author Software

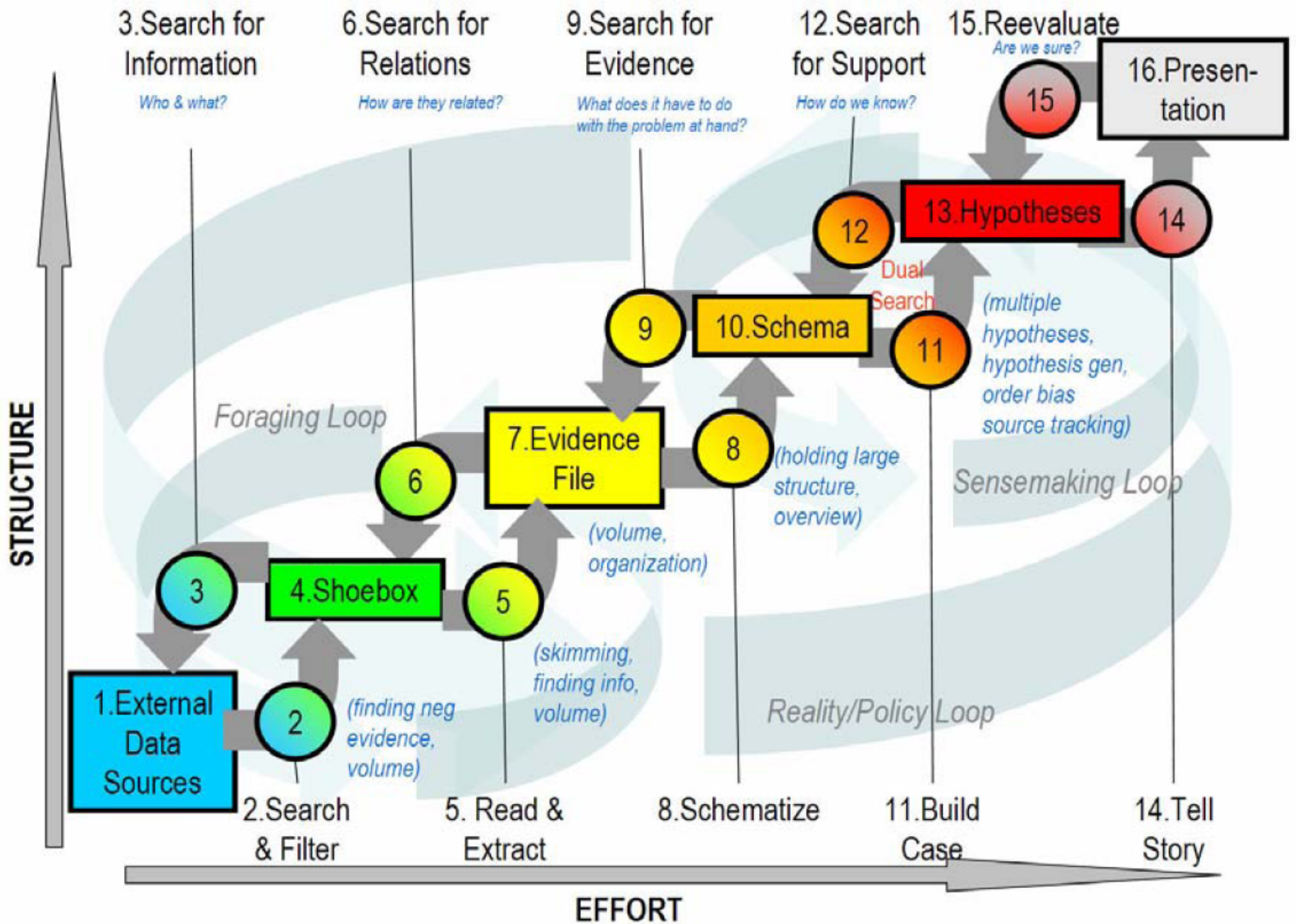
Visual Analytics

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



Sensemaking





Design Considerations

Division, allocation, and integration of work

Common ground and awareness

Reference and deixis (pointing)

Identity, trust, and reputation

Group formation and management

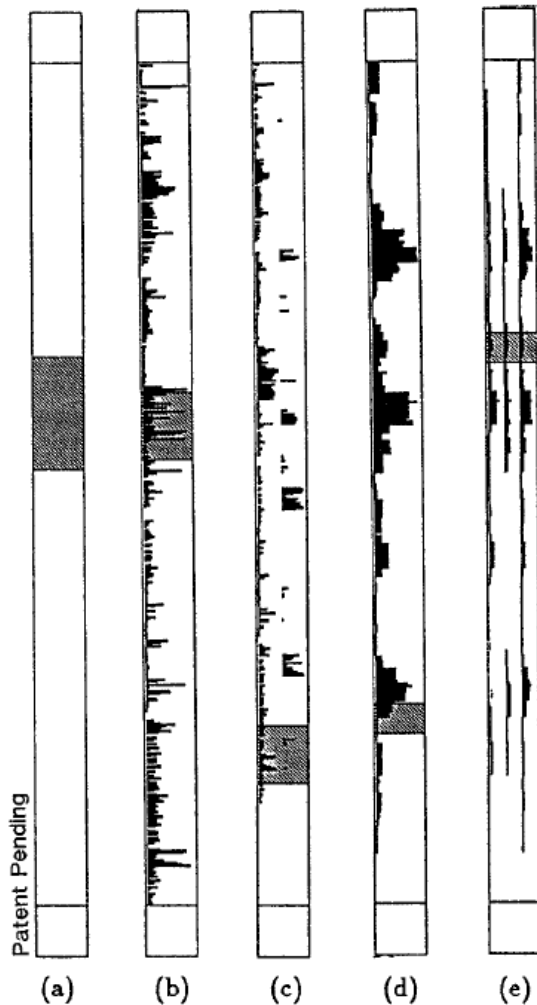
Incentives and engagement

Presentation and decision-making

Social Data Analysis

How can users' **activity traces** be used to improve awareness in collaborative analysis?

Social Navigation



Read & Edit Wear, Hill et al 1992

[del.icio.us / jheer /](#)

[your bookmarks](#) | [your network](#) | [subscriptions](#) | [links for you](#) | [post](#)

All your items (189)

[« earlier](#) | [later »](#) page 1 of 19

[2005 MicroGraph Winners](#) [edit / delete](#)
to visualization photography science ... [saved by 5 other people](#) ... on sept 20

[NEJM -- The Spread of Obesity in a Large Social Network over 32 Years](#) [edit / delete](#)
to health networks research science social visualization psychology ... [saved by 30 other people](#) ... on sept 06

[PetersProjection-over.gif \(GIF Image, 1203x800 pixels\)](#) [edit / delete](#)
to maps visualization ... [saved by 3 other people](#) ... on aug 30

[Forbes Lists, World's Richest People, and more - Forbes.com](#) [edit / delete](#)
to business data economics reference statistics ... [saved by 202 other people](#) ... on aug 25

[Well-formed data | Elastic lists | Nobel prize winners demo](#) [edit / delete](#)
to visualization vizgallery infovis flash sparklines design ... [saved by 516 other people](#) ... on aug 24

[Data Visualization: Modern Approaches | Graphics](#) [edit / delete](#)
to visualization web community infovis vizgallery design ... [saved by 4456 other people](#) ... on aug 24

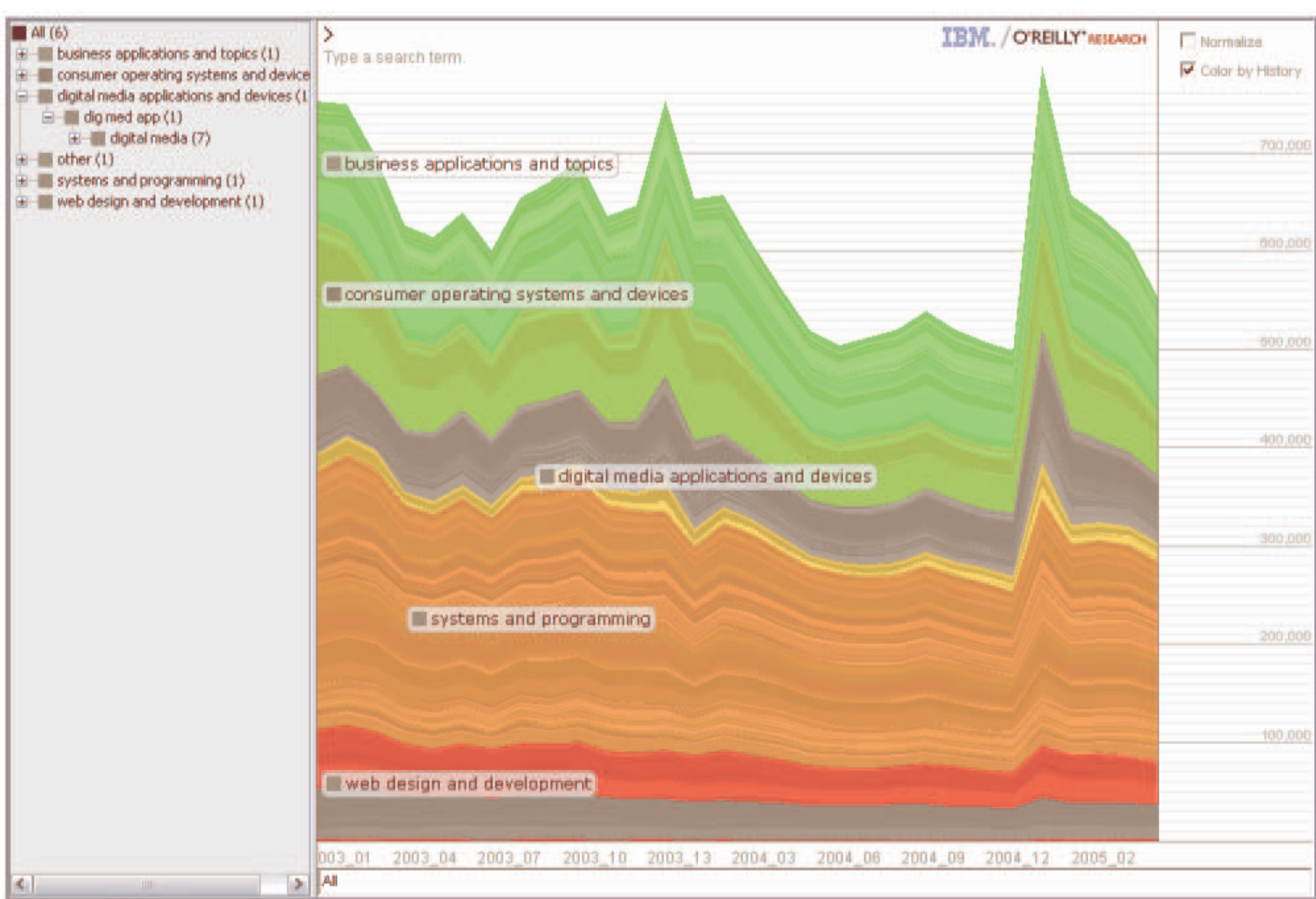
[Christian Cantrell: ActionScript PNG and JPEG Encoders Updated](#) [edit / delete](#)
... [saved by 14 other people](#) ... on aug 24

[Acrobots](#) [edit / delete](#)
to flash fun interaction animation ... [saved by 61 other people](#) ... on aug 23

[Wikinvest | The Investing Wiki with Research about Companies, Investment Concepts, and mor](#)
to collaboration web wiki reference finance economics business analysis visualization ... [saved by 724 other people](#) ...

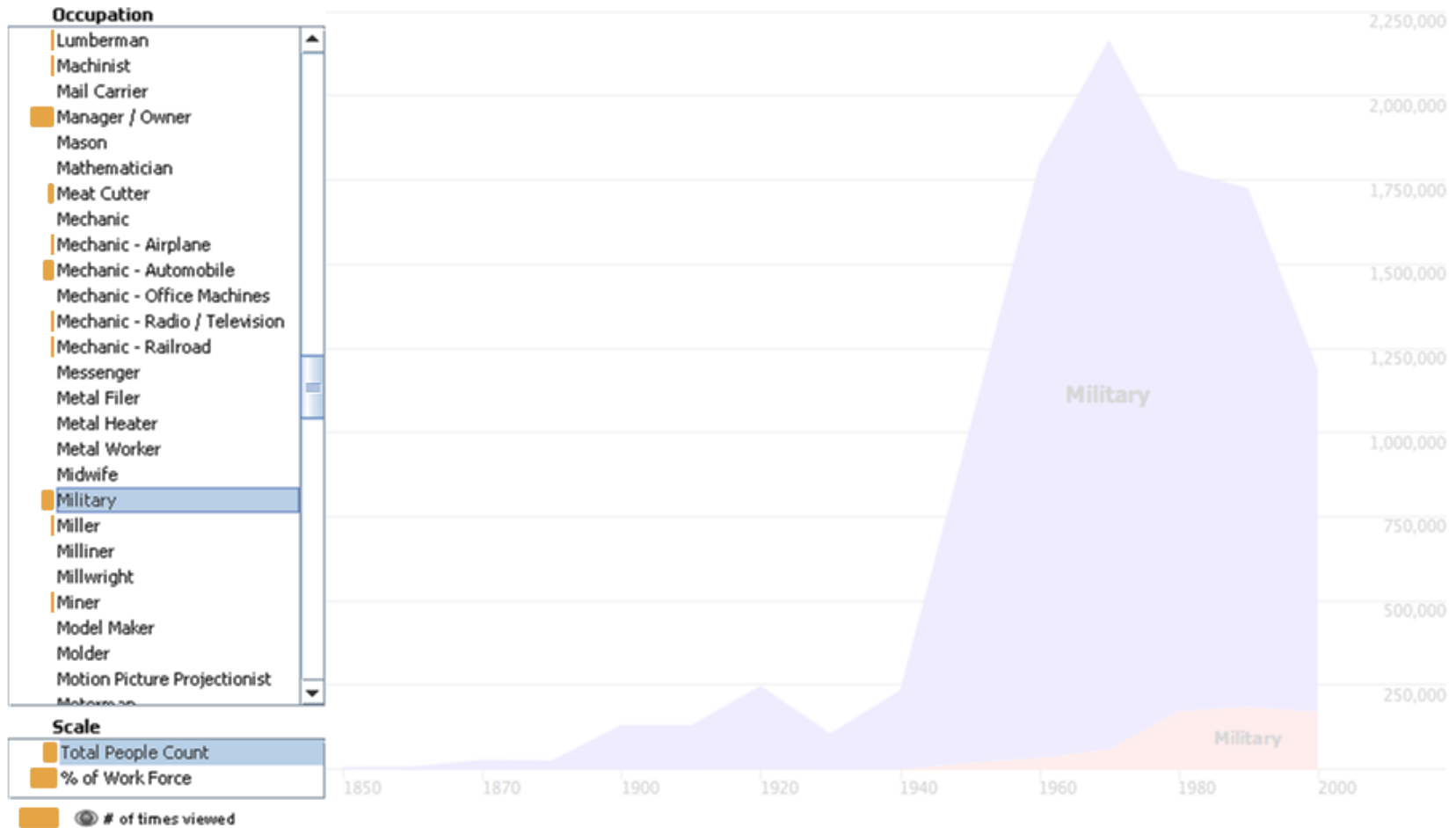
[Los Angeles Times Homicide Map](#) [edit / delete](#)
to maps statistics visualization infovis interaction news data ... [saved by 63 other people](#) ... on aug 14

[« earlier](#) | [later »](#) page 1 of 19



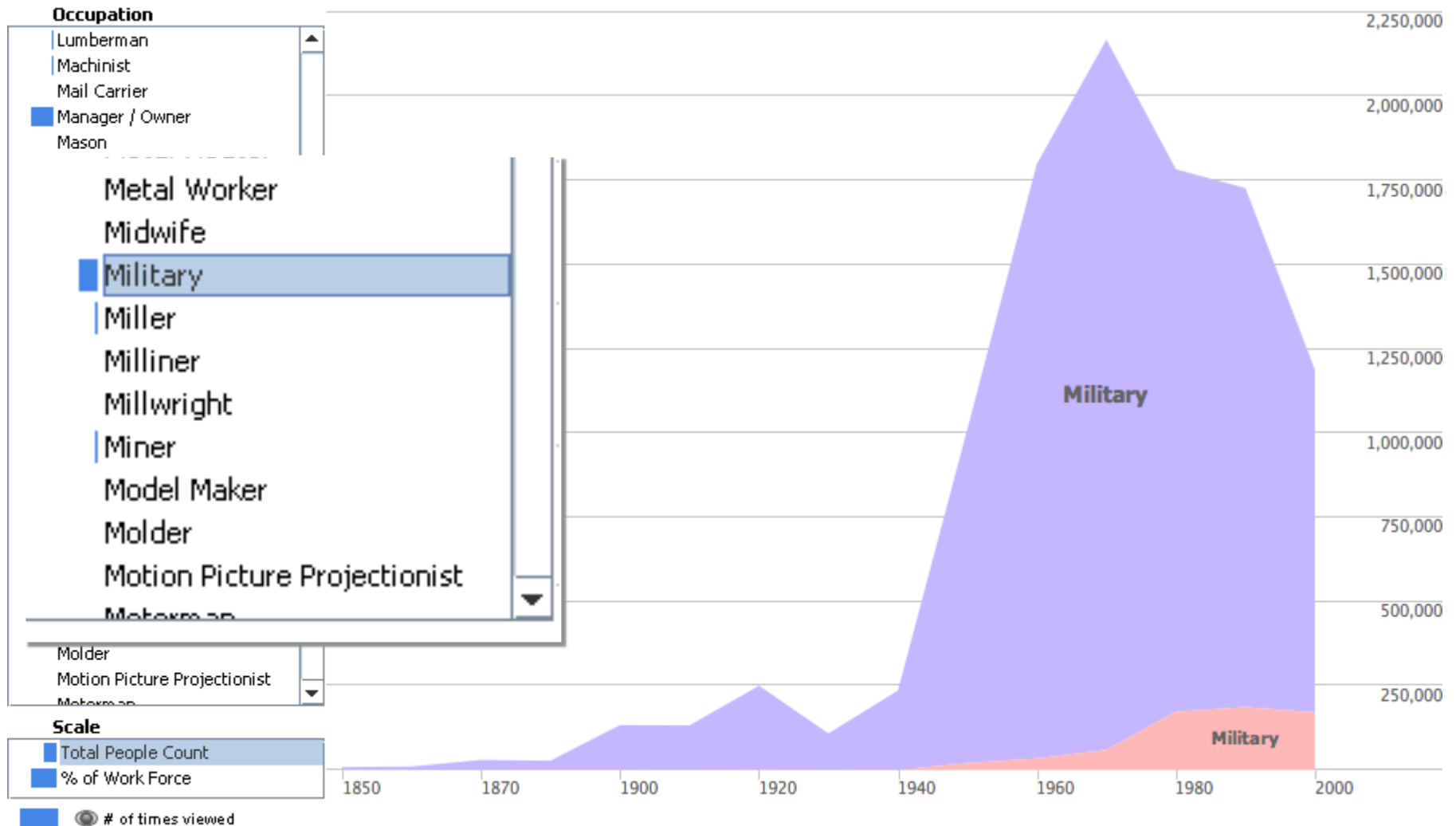
Wattenberg & Kriss - Color by history: gray regions have already been visited

Scented Widgets [InfoVis'07]

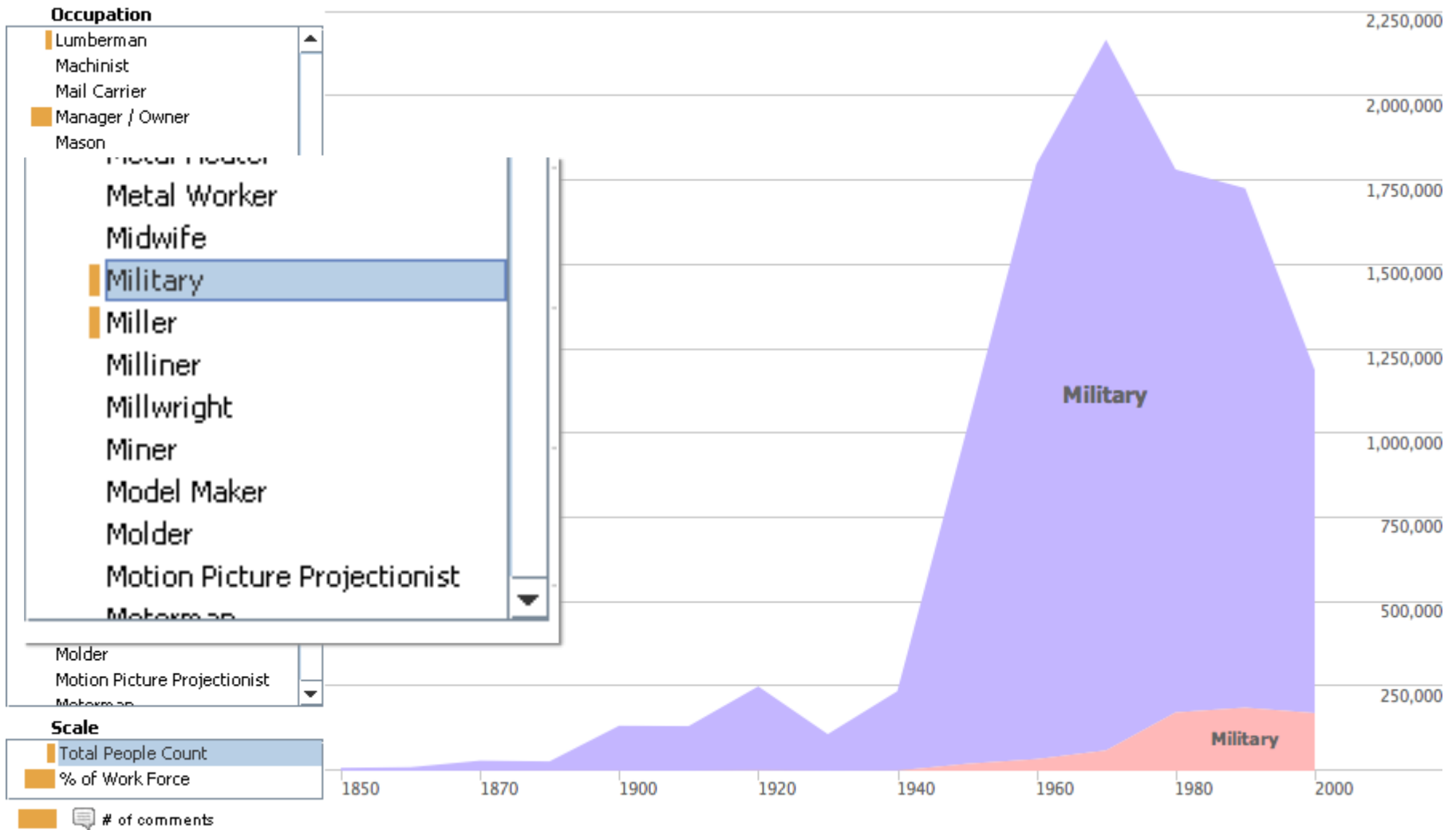


Visual navigation cues embedded in interface widgets

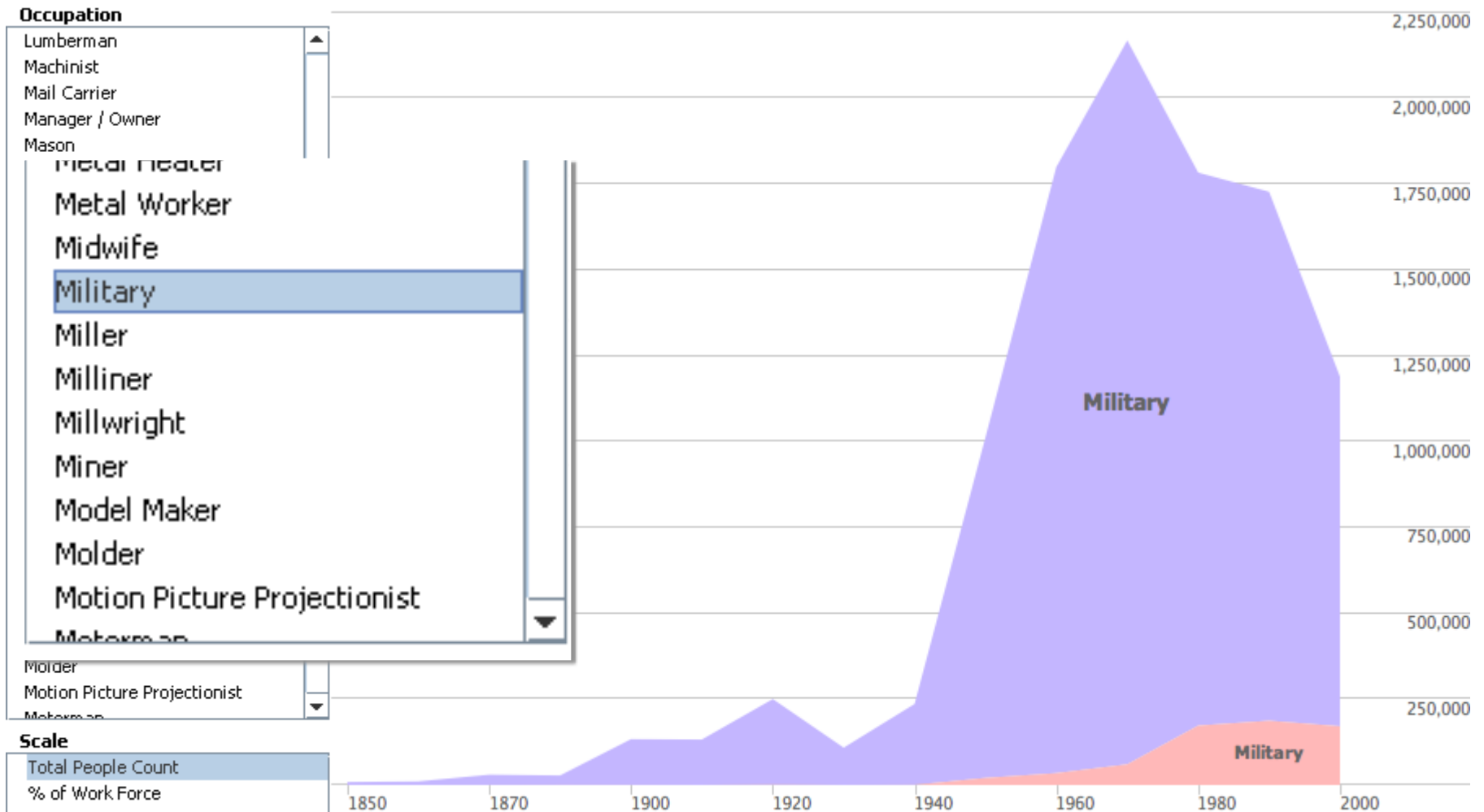
Visitation Counts



Comment Counts



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

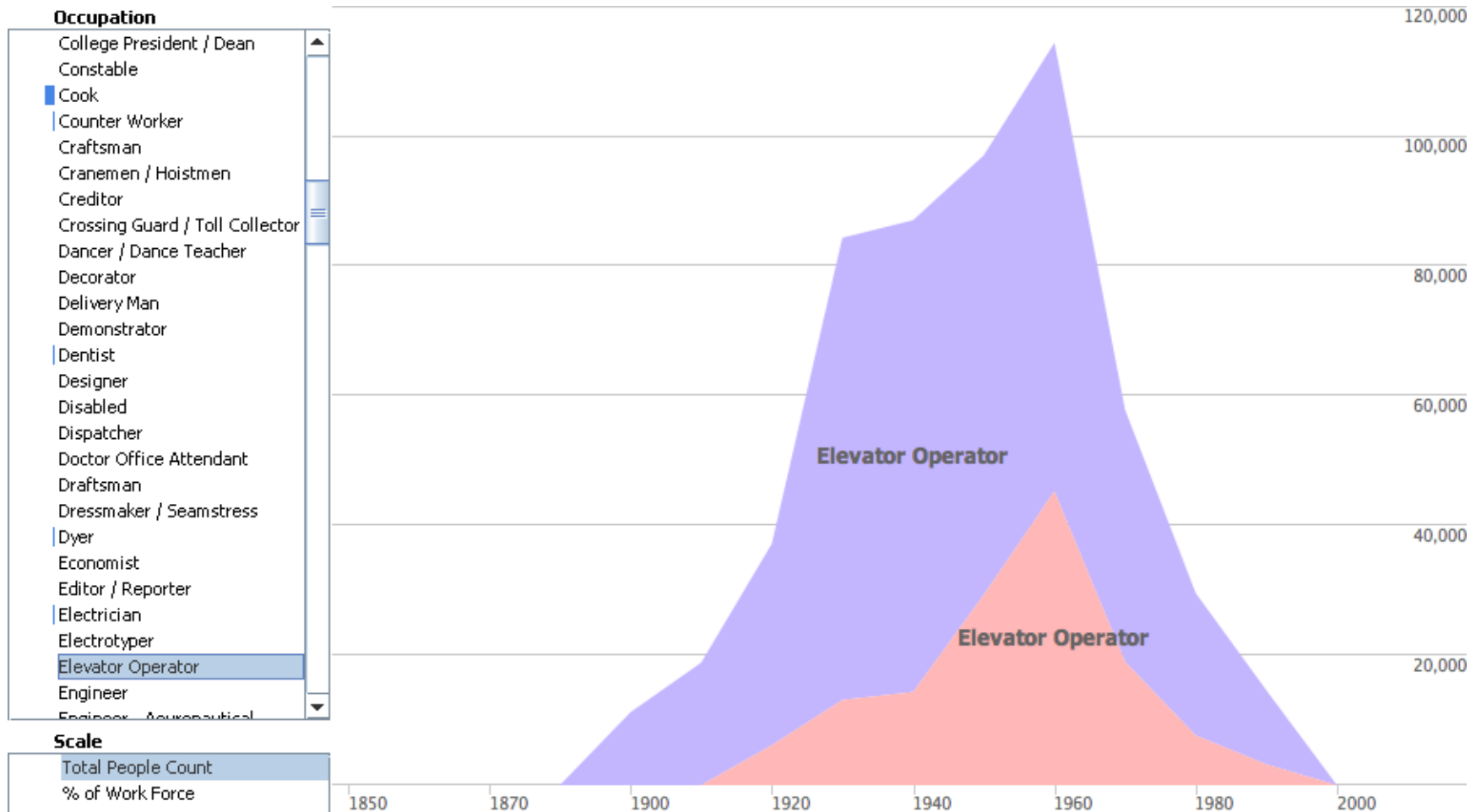
Controlled experiment with 28 subjects

Collect evidence for and against an assertion

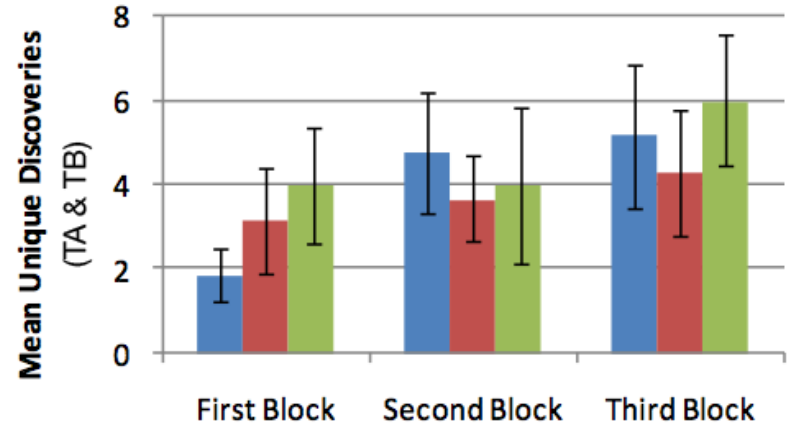
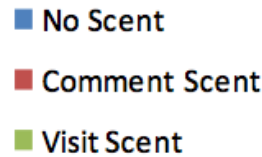
Varied scent cues (3) and foraging task (3)

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?

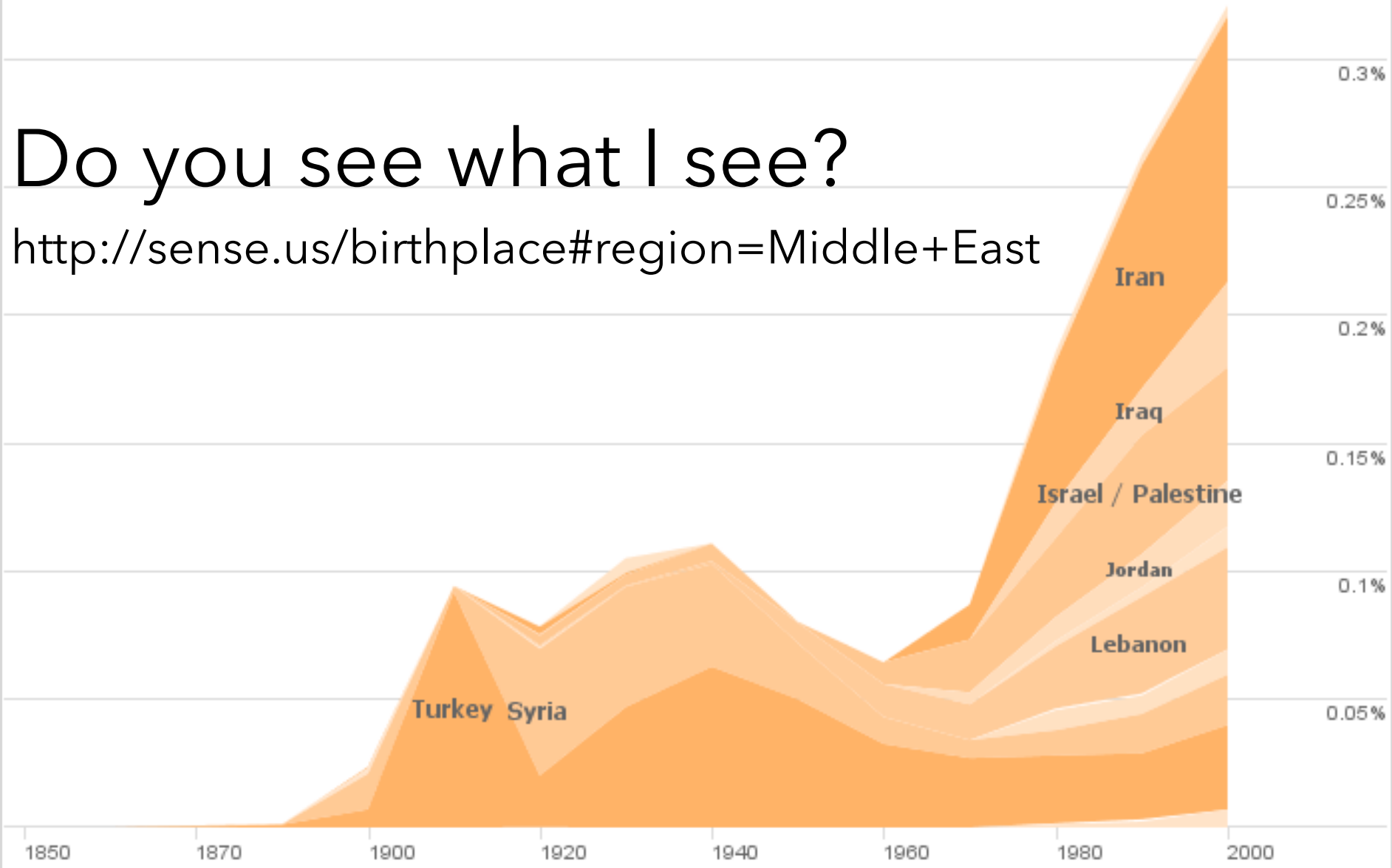
>>

■ Middle East ▾

% of U.S. Population ▾

Do you see what I see?

<http://sense.us/birthplace#region=Middle+East>



□ Annotate



Stroke

■ Fill



Sans-Serif

▾ 14 ▾

B

I

Common Ground

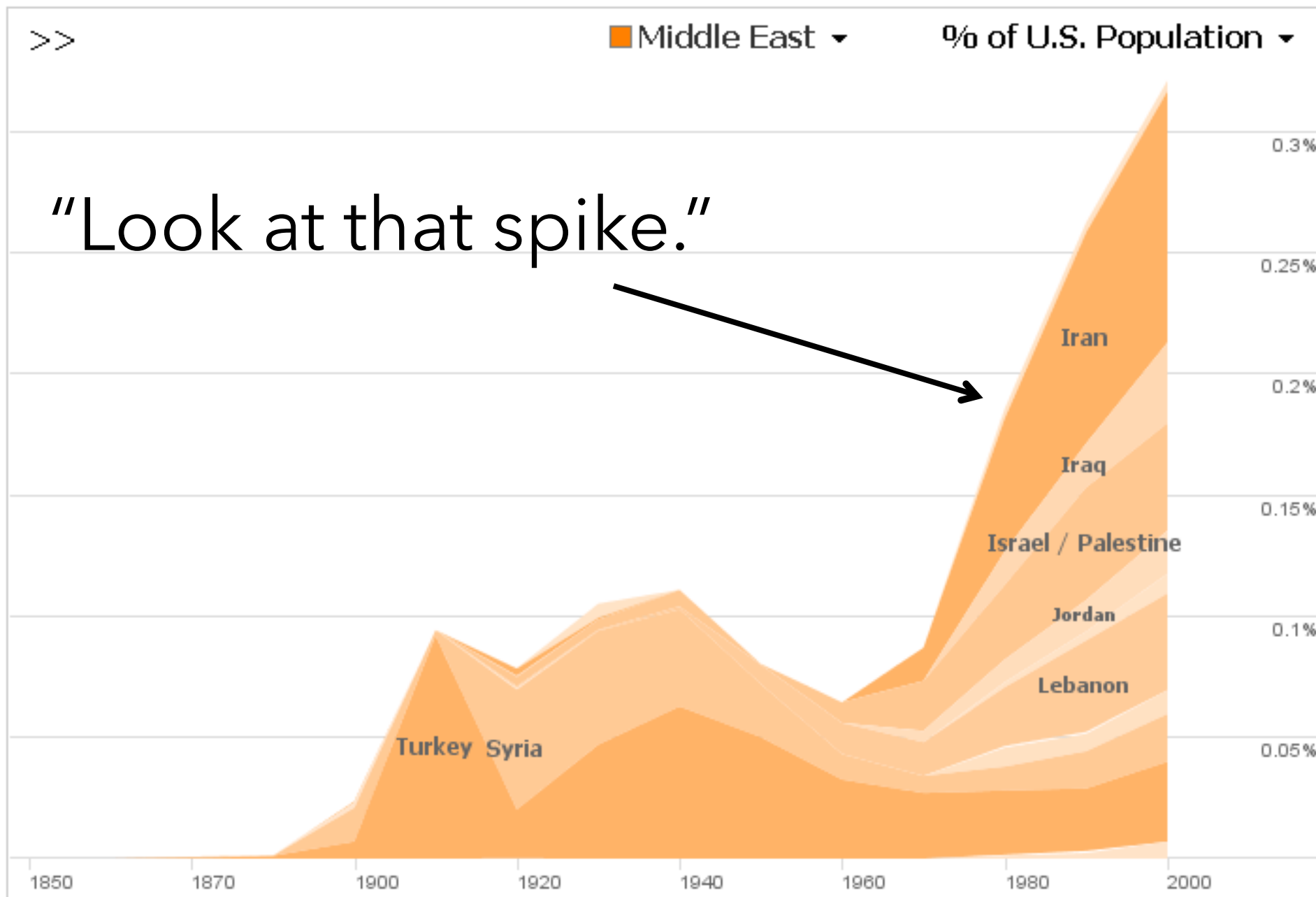
Common Ground: the shared understanding enabling conversation and collaborative action
[Clark & Brennan '91]

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]

Reported Birthplace of U.S. Residents, 1850-2000 (source: <http://ipums.org>)



“Look at that spike.”

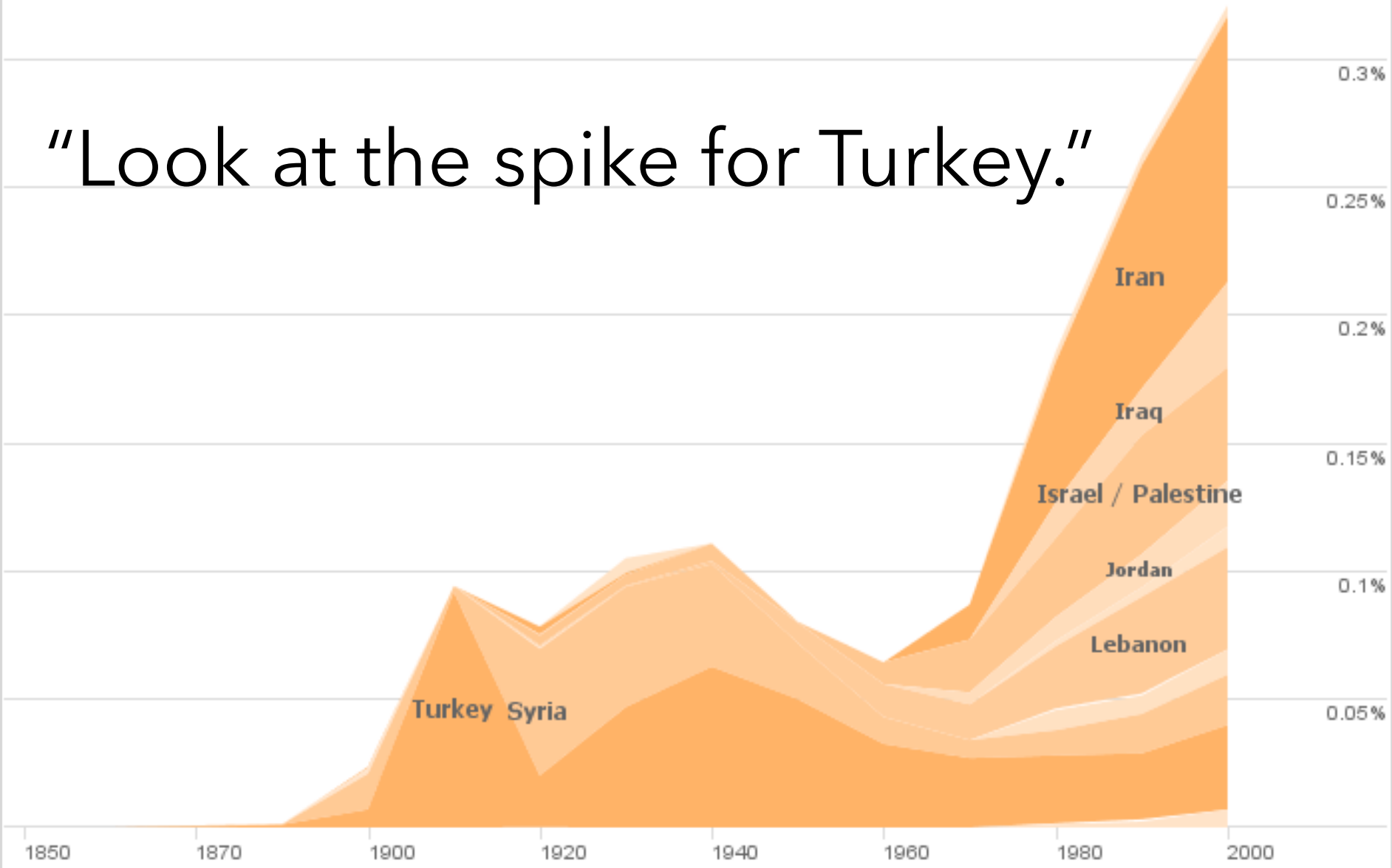


>>

■ Middle East ▾

% of U.S. Population ▾

“Look at the spike for Turkey.”



□ Annotate



Stroke ■ Fill ▨ ▮ ▯ ▰ ▱ ▲ △ ▴ ▵ ▶ ▷ ▸ ▹ ► ▻ ▼ ▽ ▾ ▿ ▸ ▹ ► ▻ ▼ ▽ ▾ ▿

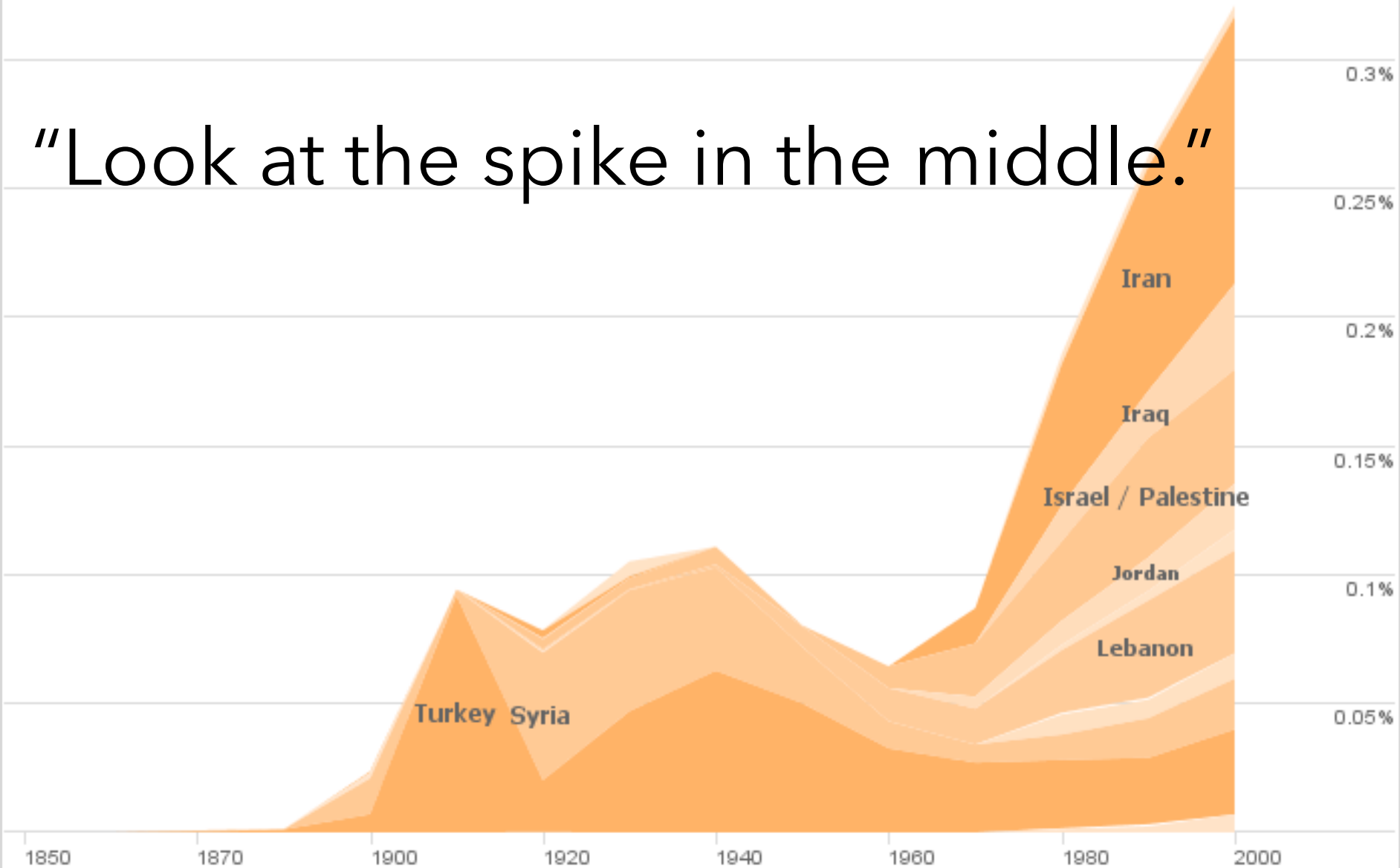
▼ 14 ▼ B I

>>

■ Middle East ▾

% of U.S. Population ▾

“Look at the spike in the middle.”



□ Annotate



Stroke



Fill



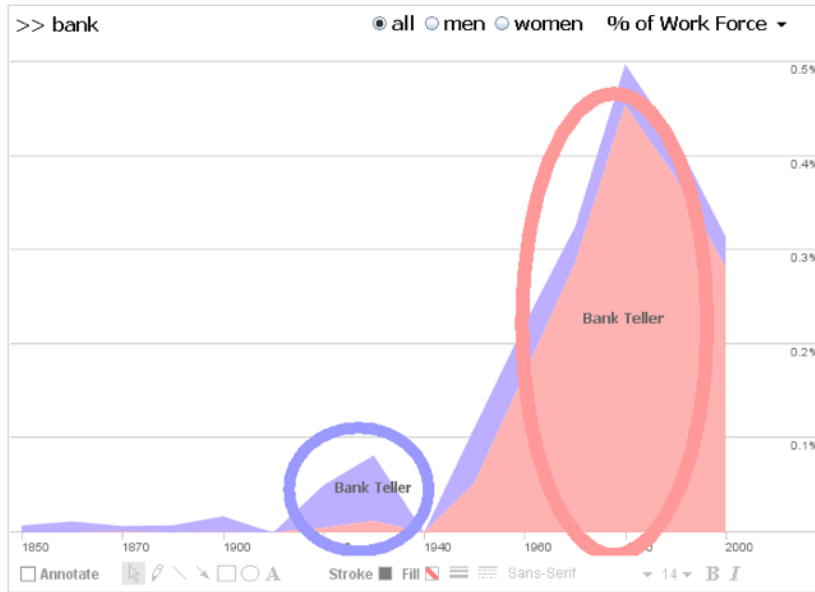
Sans-Serif

▾ 14 ▾

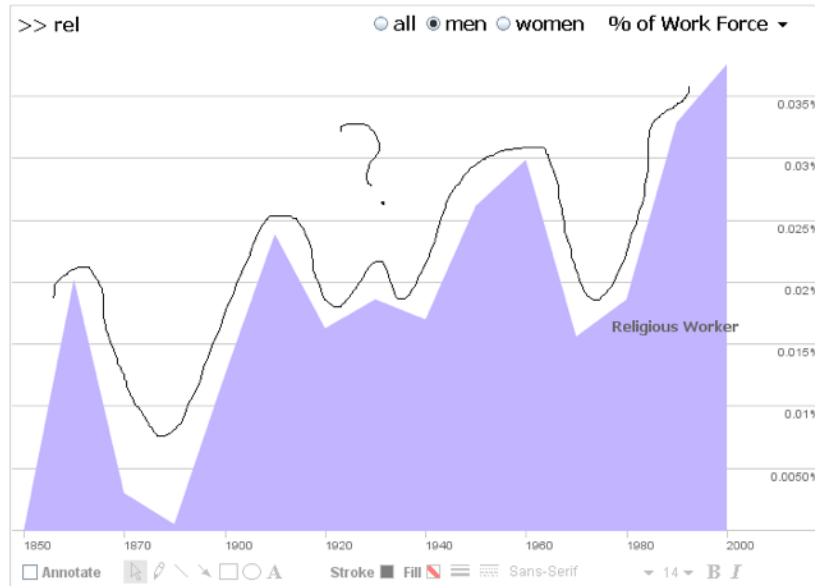
B

I

Reported Occupations of U.S. Labor Force, 1850-2000 (source: <http://ipums.org>)

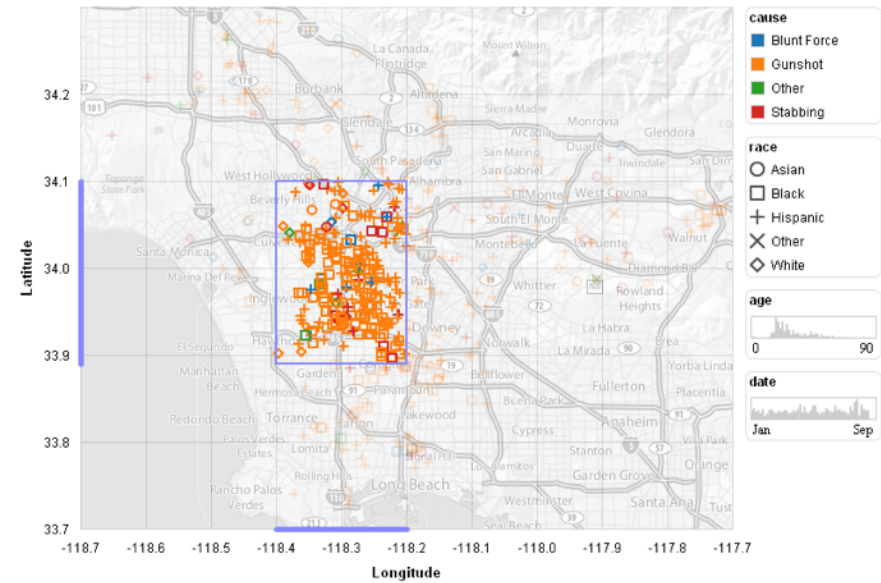


Reported Occupations of U.S. Labor Force, 1850-2000 (source: <http://ipums.org>)

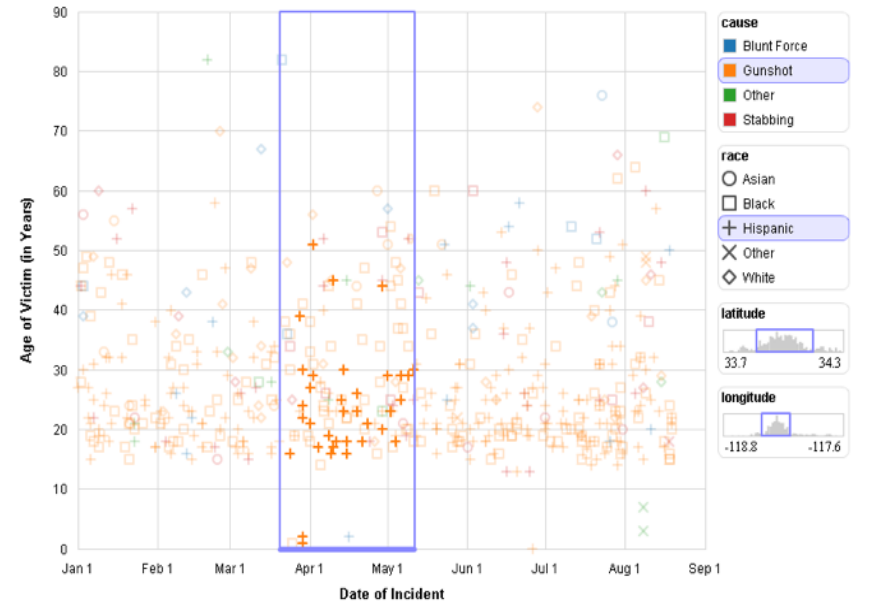


Free-form

Homicide Victims in Los Angeles County, 2007 (Source: LA Times)









Homicide Victims in Los Angeles County, 2007 (Source: LA Times)



Data-aware

Use of Annotations

Arrows		25.1%	
Text		24.6%	
Ovals		17.9%	
Pencil		16.2%	
Lines		14.5%	
Rectangles		1.7%	

39.0% of comments included annotations

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

Drawing to socialize or tell jokes (11.4%)

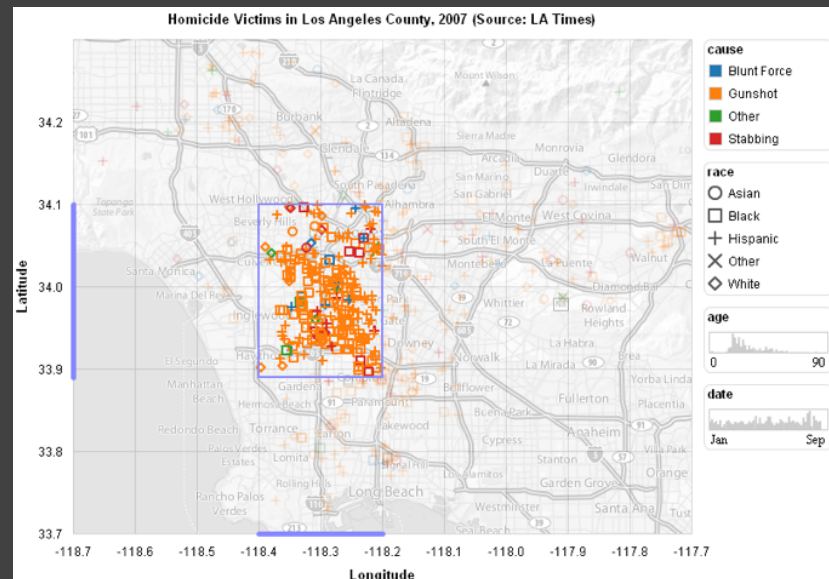
Variety of subject responses

'Not always necessary', but 'surprisingly satisfying'

Some concern about professional look

Visual Queries

Model selections as **declarative queries** over interface elements or underlying data



$(-118.371 \leq lon \text{ AND } lon \leq -118.164) \text{ AND } (33.915 \leq lat \text{ AND } lat \leq 34.089)$

Visual Queries

Model selections as **declarative queries** over interface elements or underlying data

Applicable to **dynamic, time-varying data**

Retarget selection **across visual encodings**

Support **social navigation and data mining**

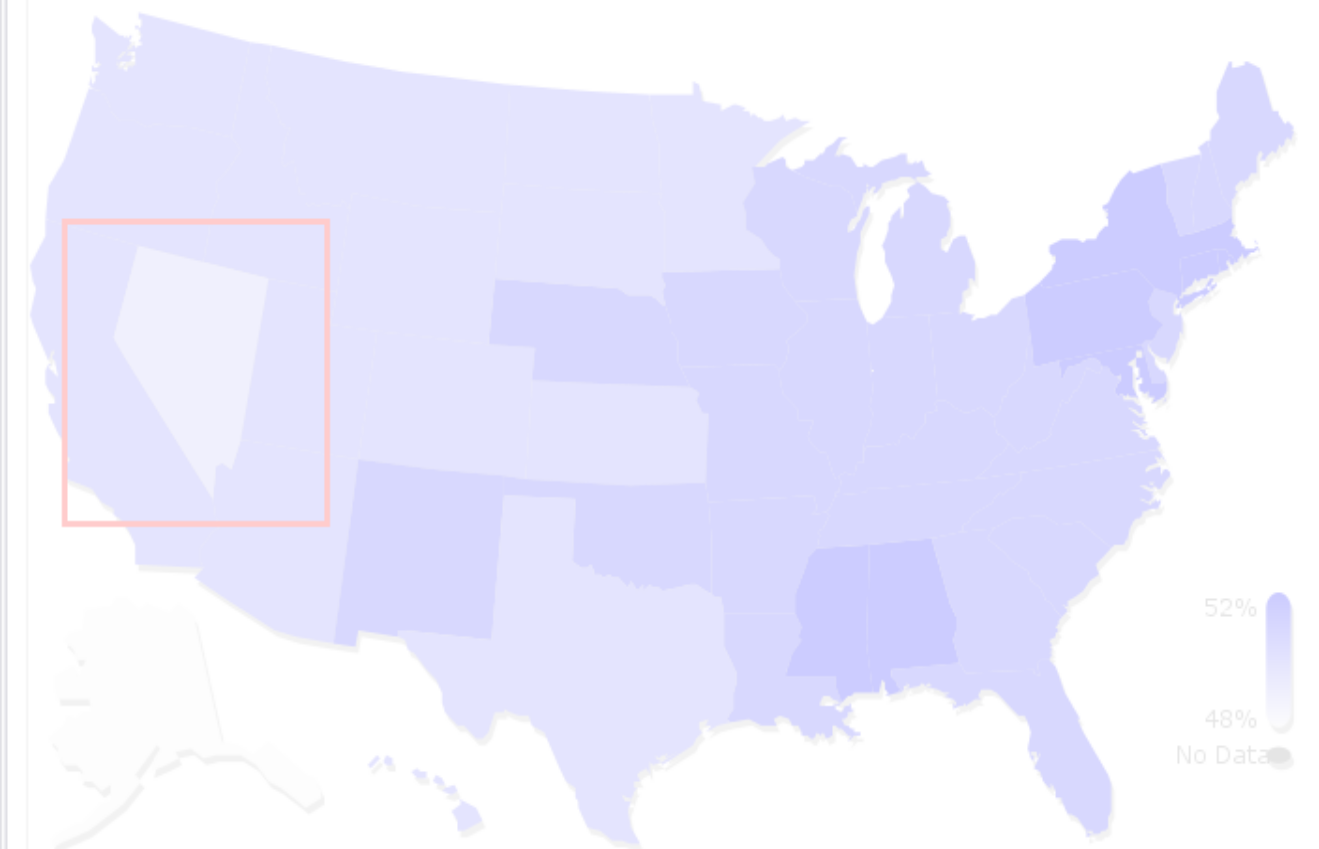
Social Data Analysis

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)


 Annotate

Stroke Fill Sans-Serif

14 B I

 comments (5) [New Comment](#) | [View All \(16\)](#)

 ▼ [All the Men are Moving to Nevada?](#) (5)

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

reply

 bookmarks (3) [Add View](#) | [Save](#) | [Load](#) | [View All](#)




Schema

commands.csv Connection

Find:

- Dimensions**
- Abc Command
 - Abc Command Group
 - Abc Date
 - Abc Description
 - Abc Logfile
 - Abc Sheetname
 - Abc Shelf
 - Abc Time
 - Abc Username
 - Abc Workbook
 - Abc Measure Names

Measures

- # Measure Values

Groups

Worksheets

Filters:

Graphic Type:

All

Bookmarks: Show Only

Export Reset

Columns: CNT(Com..)

Rows: Command Shelf

Filters: Command

Level of Detail:

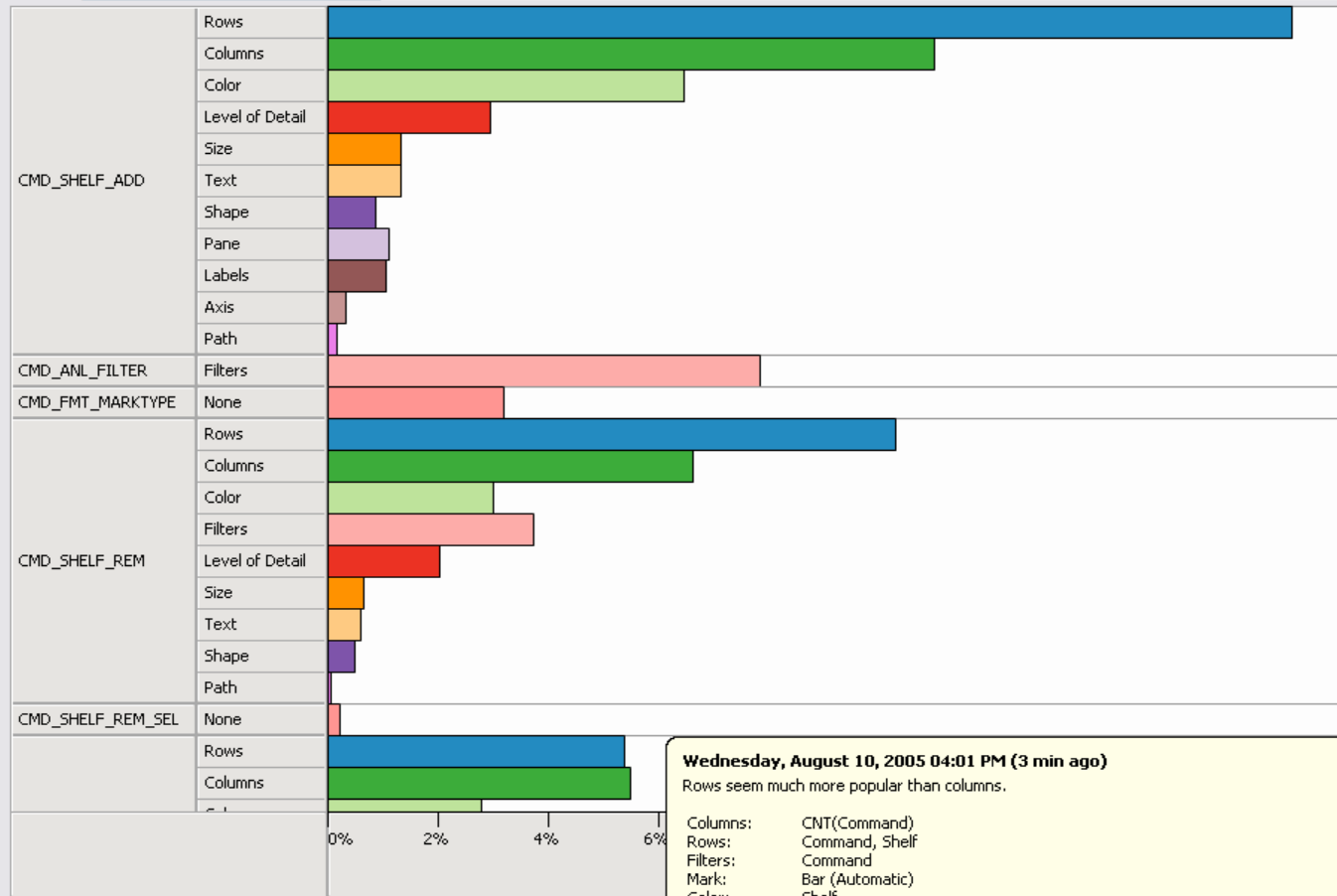
Mark: Automatic

Color: Shelf

Size:

- Legend:**
- Rows
 - Columns
 - Color
 - Filters

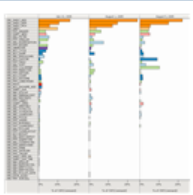
Size:



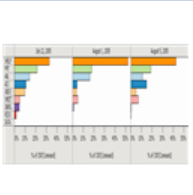
Wednesday, August 10, 2005 04:01 PM (3 min ago)
 Rows seem much more popular than columns.

Columns: CNT(Command)
 Rows: Command, Shelf
 Filters: Command
 Mark: Bar (Automatic)
 Color: Shelf

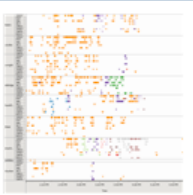
Command Counts Command Groups Timeline 07/22 Timeline 08/01 Shelves



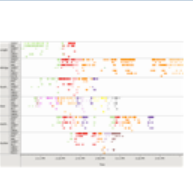
Command Counts



Command Groups



Timeline 07/22

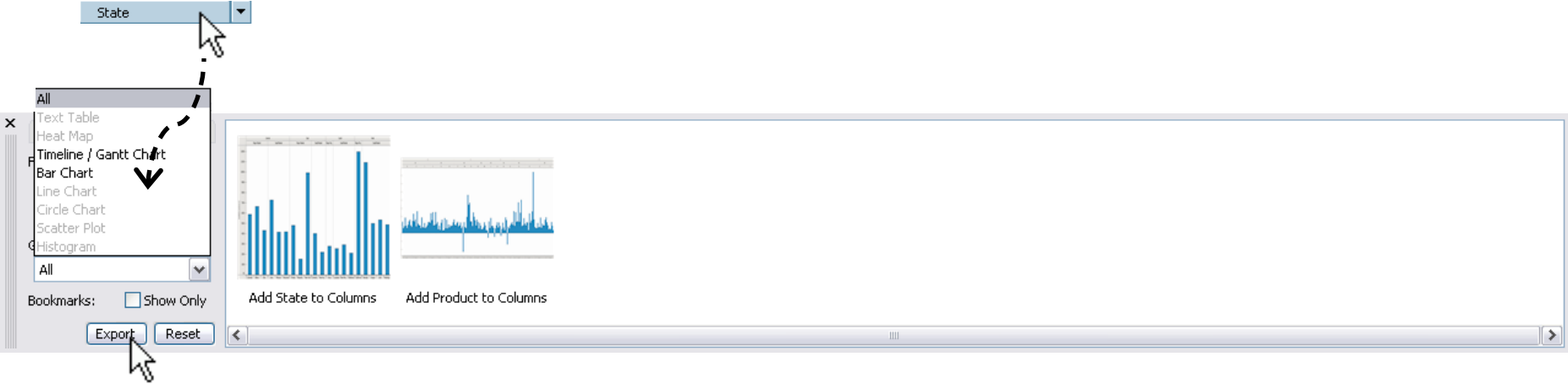


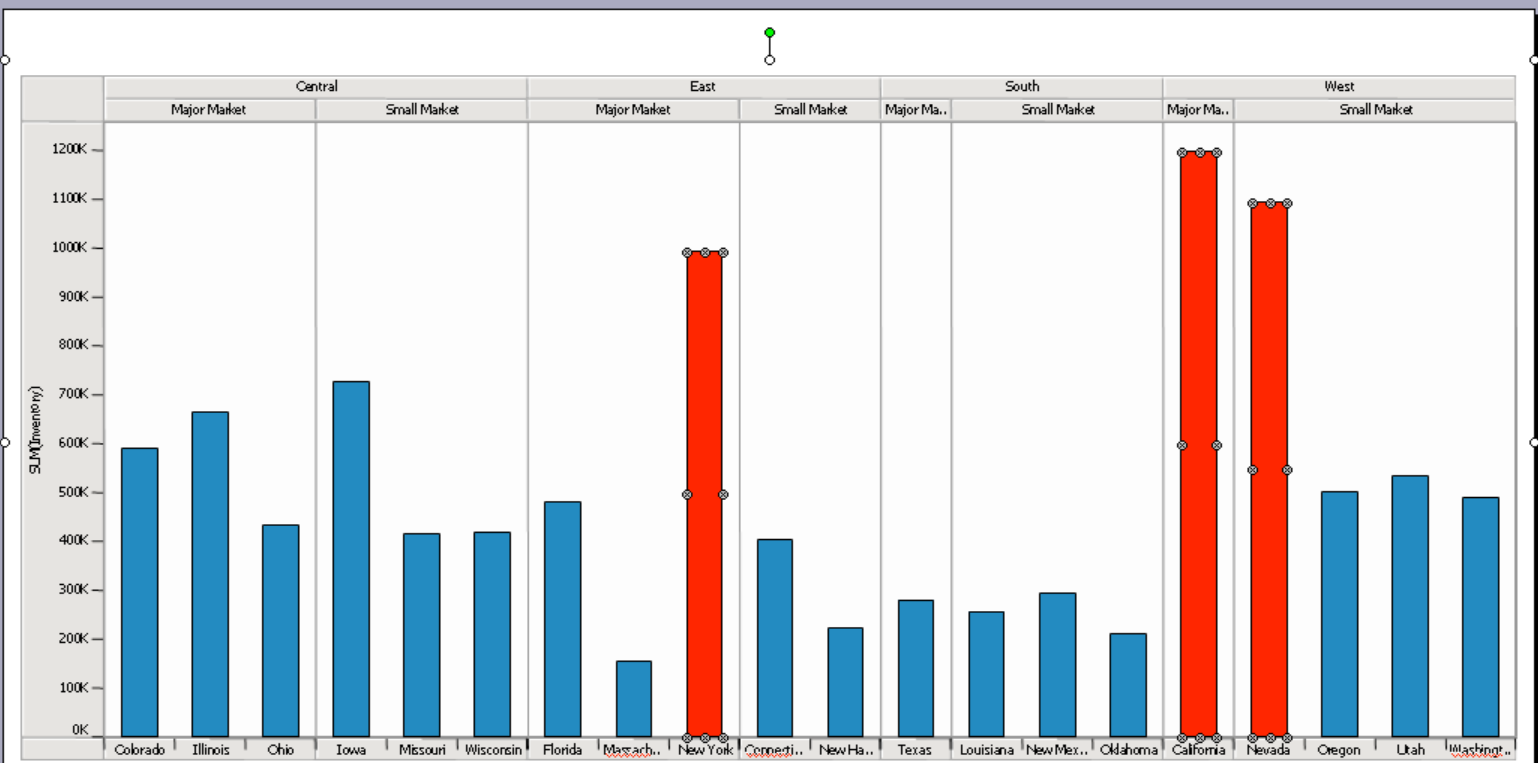
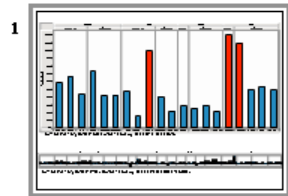
Timeline 08/01



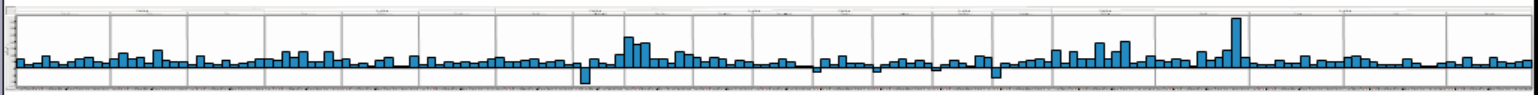
Shelves

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.

Click to add notes

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**?

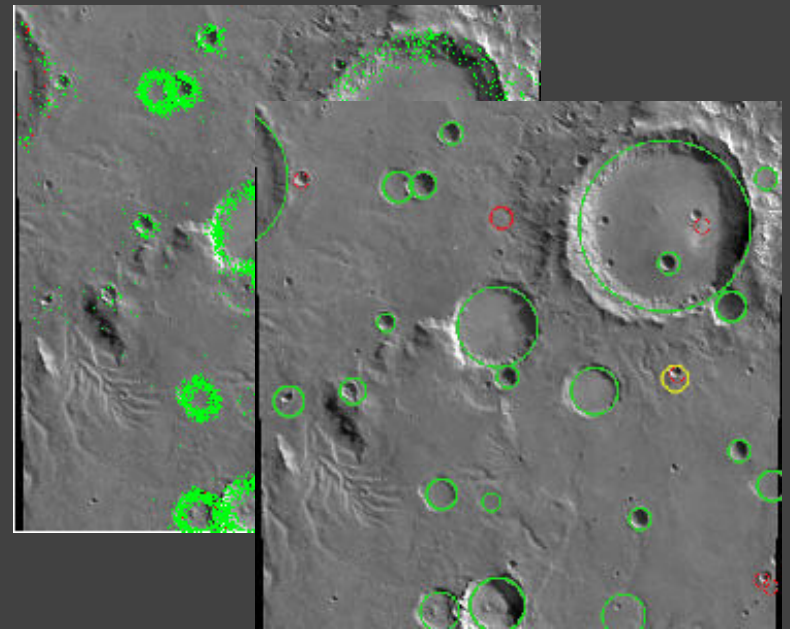
How can contributions be **better integrated**?

Structured Conversation

Reduce the cost of synthesizing contributions



Wikipedia: Shared Revisions



NASA ClickWorkers: Statistics

Integration: Evidence Matrices

Cache 3.00 2.2 Anderson 8802 1908 GC 59740-1 - Mozilla Firefox

http://andersen.perc.oxrc.com:5982/html/display.html?id=24&sig=GWYHBTAG

Current World: **Experiment**
 Current Matrix: **Analyst alpha**

[H] GC-IOWA	Evidence Ops	[H] Overran ?	[H] Friction ?	[H] Hartwig ?	Diagnosticity:
[1] Navy: no systemic pr...	HIGH	C	I	I	Diagnostic (+1, -2)
[1] Gunpowder is leaking...	HIGH	N/A	N/A	I	Non-Diagnostic
[1] Glycol is present in...	HIGH	I	C	I	Diagnostic (+1, -2)
[1] Iowa Commanding Offi...	MEDIUM	N/A	I	N/A	Non-Diagnostic
[1] A recent similar inc...	HIGH	CC	N/A	I	Diagnostic (+1, -1)
[1] No direct evidence o...	LOW	N/A	C	I	Diagnostic (+1, -1)
[1] In 1943 friction had...	MEDIUM	CC	I	C	Diagnostic (+2, -1)
Belief:		00	00	00	
Support:		-1.75	-2.0	-4.5	

Cache 3.00 v2.2

Alpha's ACH matrix

Integration: Evidence Matrices

Alpha's CACHE workspace



Beta's matrix



Ticker



Gamma's matrix

+



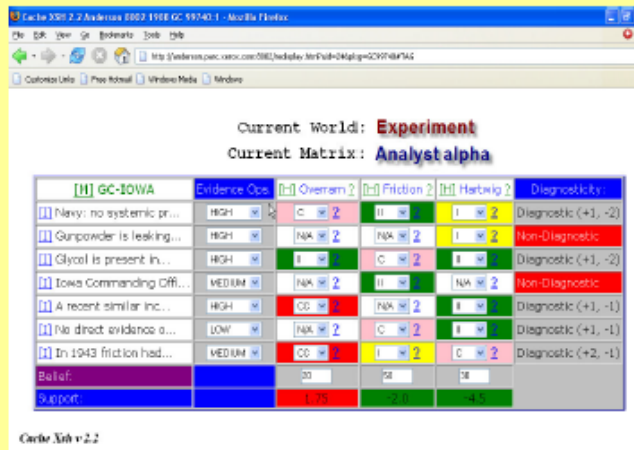
Chat tool

Sharing & coordination

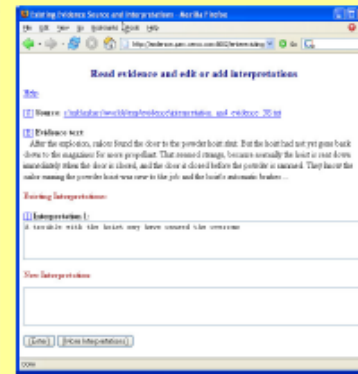
Individual analysis



Search

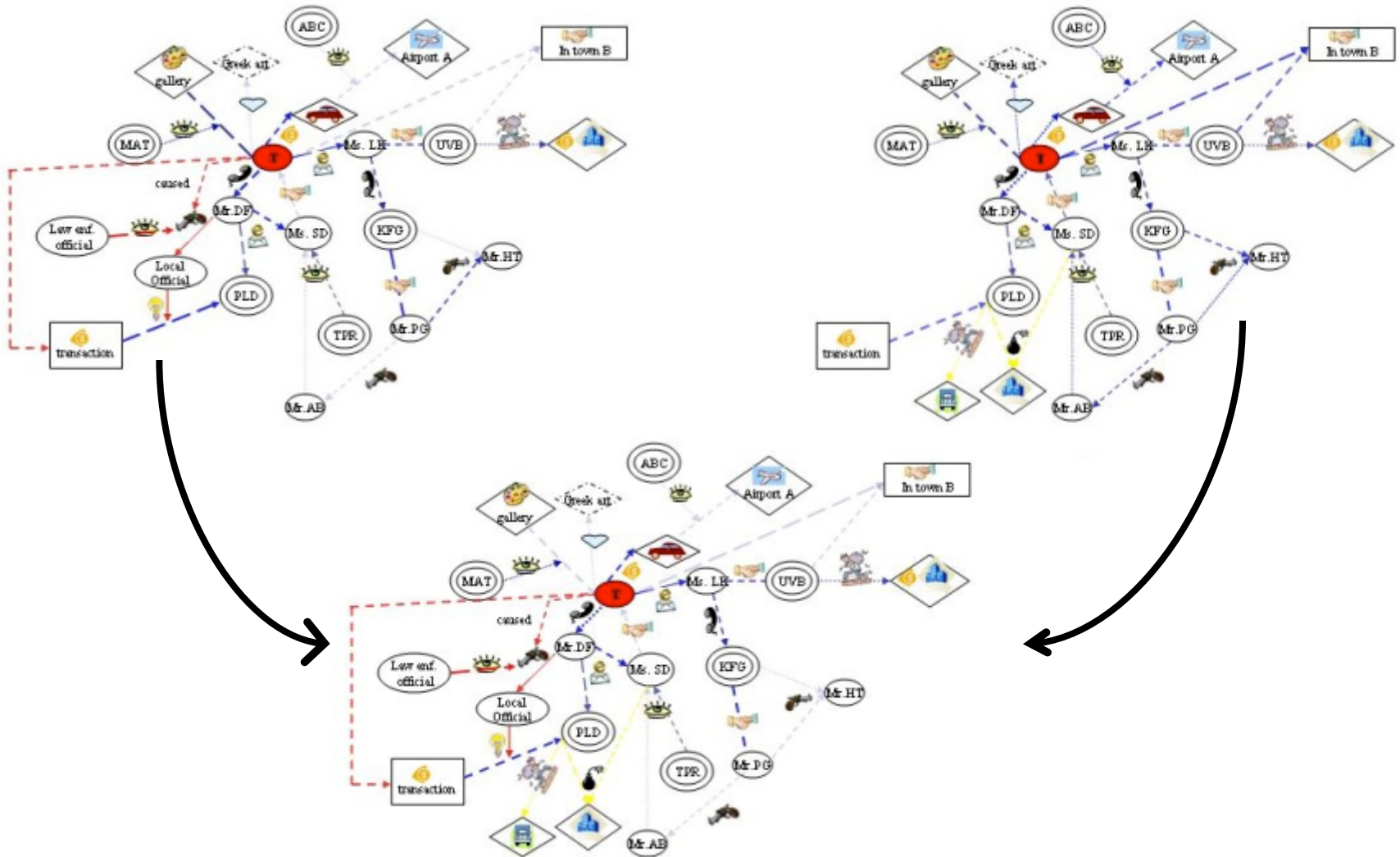


Alpha's ACH matrix



Read & Interpret

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**?