

The Value of Visualization for Understanding Data and Making Decisions

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Data

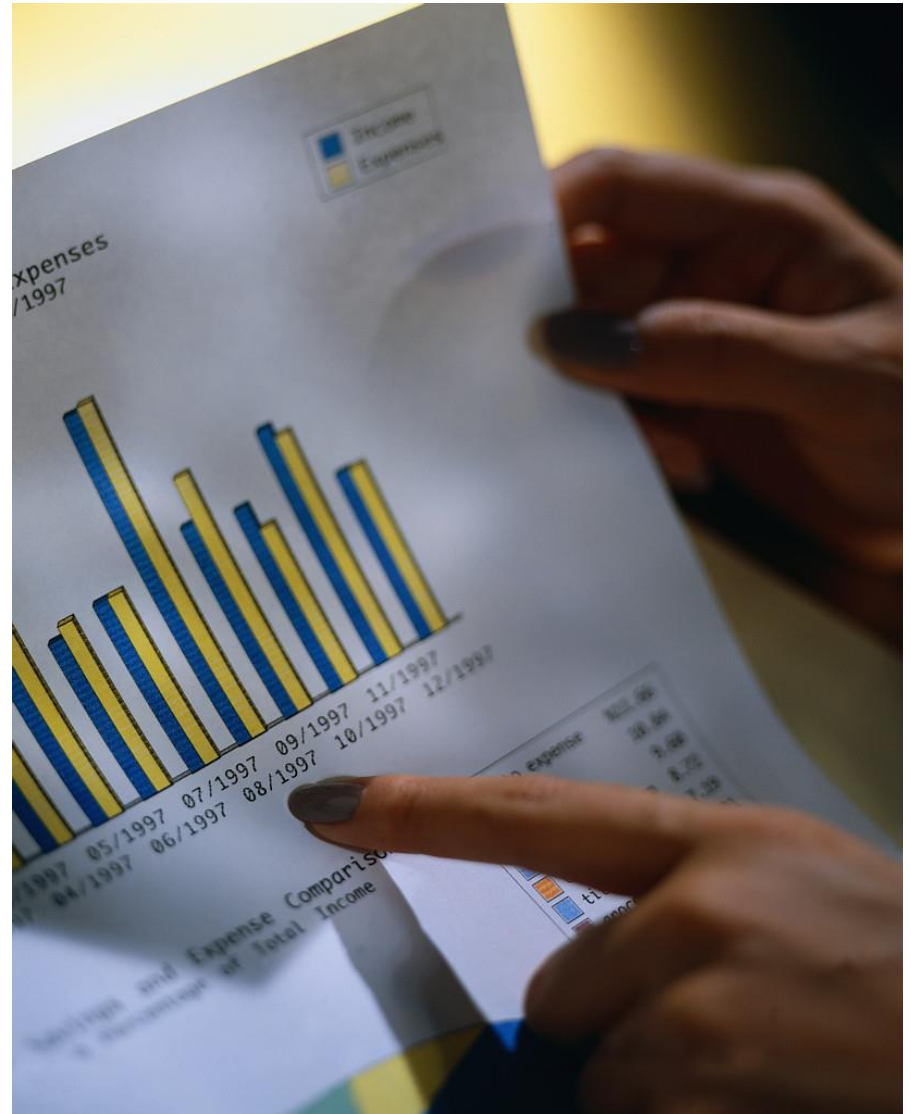
Many Data Analysis Approaches

Statistics

Database & information retrieval

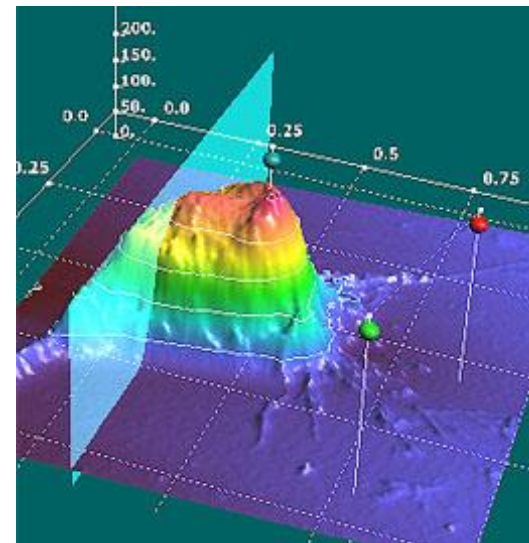
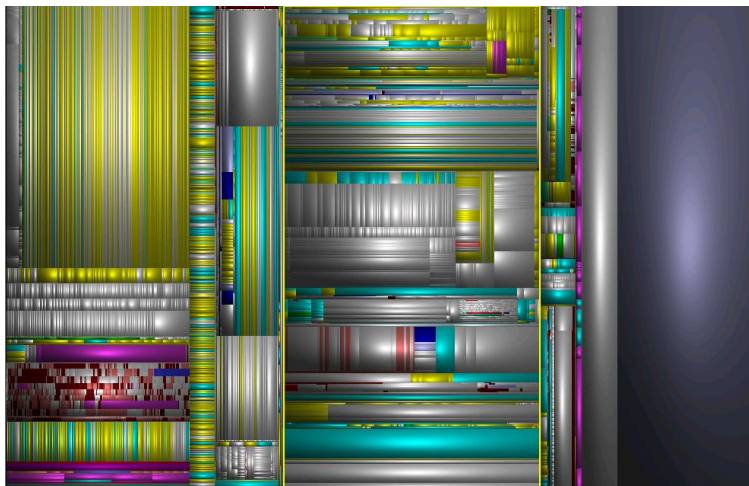
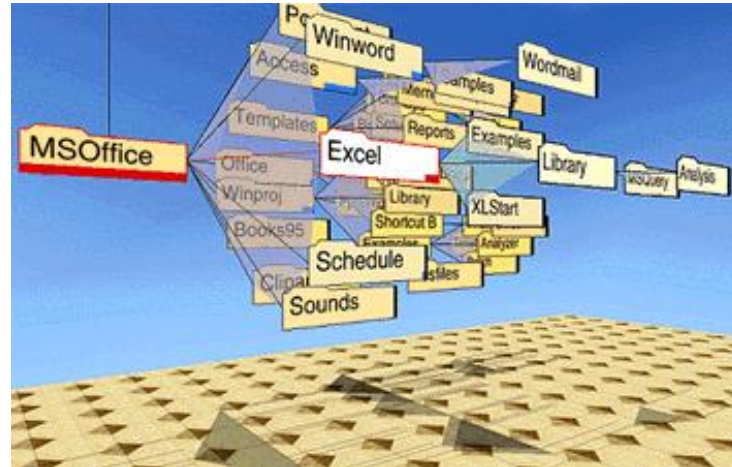
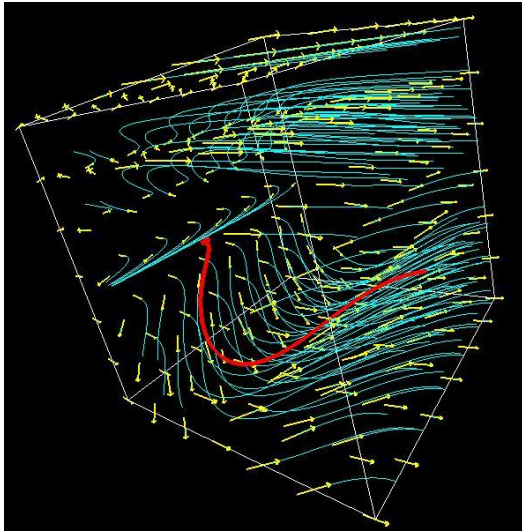
Data mining

Machine learning



Data Visualization

~~Making pretty pictures?~~



Data Visualization

A cognitive process

Gain an understanding

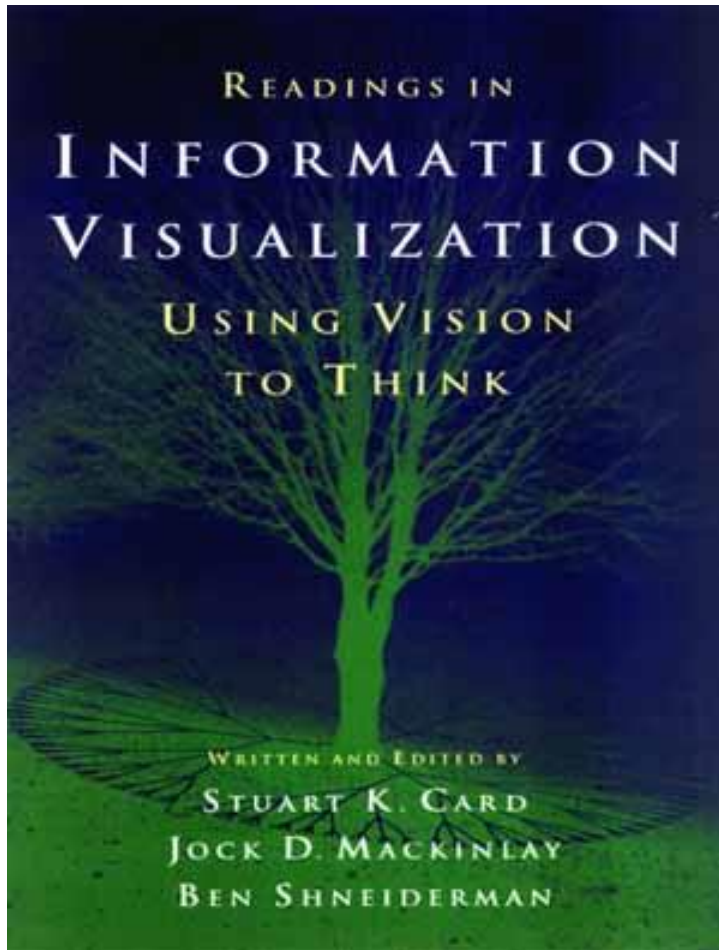


Data Visualization

A cognitive process

Gain an **understanding**





Visualization

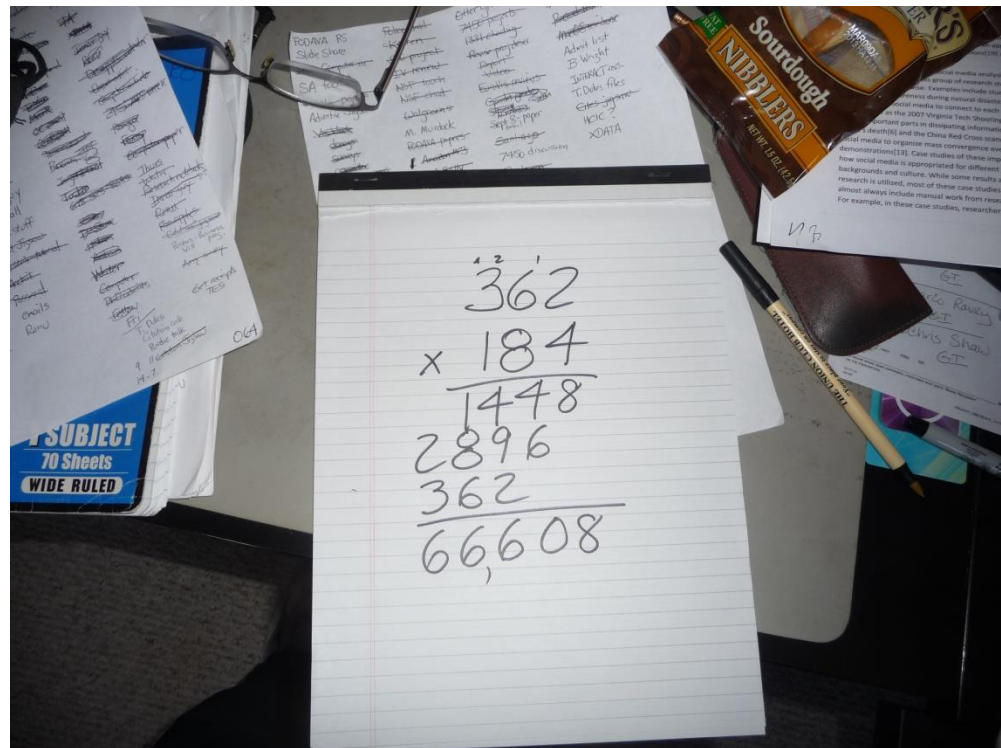
“The use of computer-supported, interactive visual representations of data to amplify cognition”

Visuals help us think

Provide a frame of reference, temporary storage area

Cognition → Perception

Pattern matching



Applications of Visualization

Presentation

Analysis

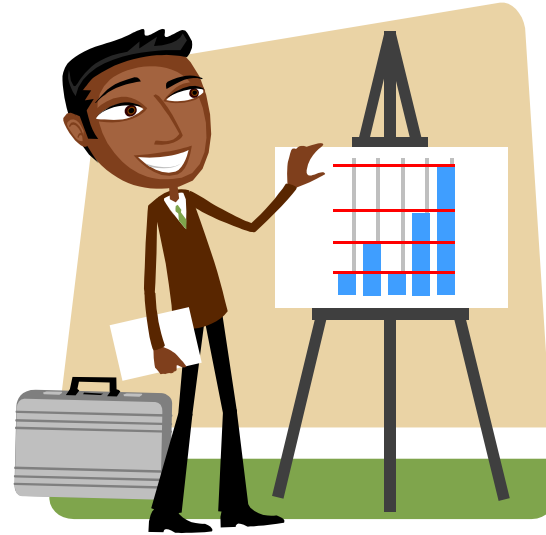
1. Presentation

Communicate data and ideas

Explain and inform

Influence and persuade

Provide evidence and support

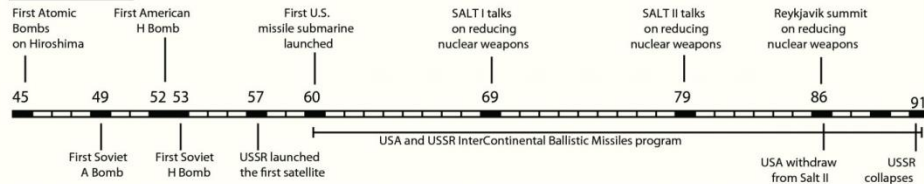


Infographics

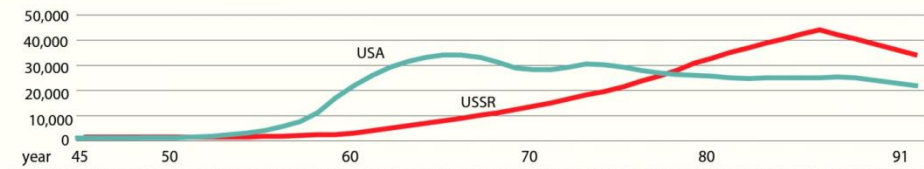
THE NUCLEAR ARMS RACE

It was the main issue in the Cold War when both America and Russia challenging each other to increase their stockpiles of nuclear weapons.

TIMELINE



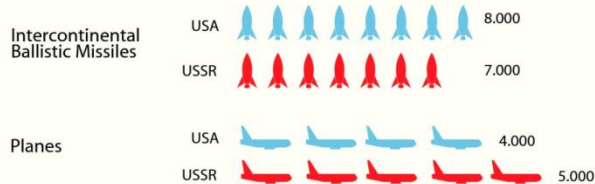
NUCLEAR STOCKPILE



ROCKET MODELS

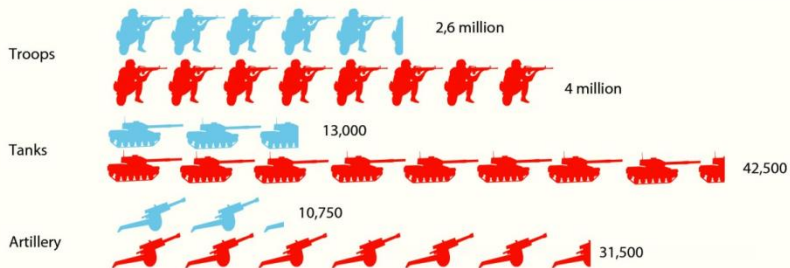


AIR CONTROL



A WORLD BREAK IN TWO

NATO and Warsaw Pact were both mutual defense treaties between states. The first one started on 1949 till today while the Warsaw Pact lasted from 1955 till 1991.



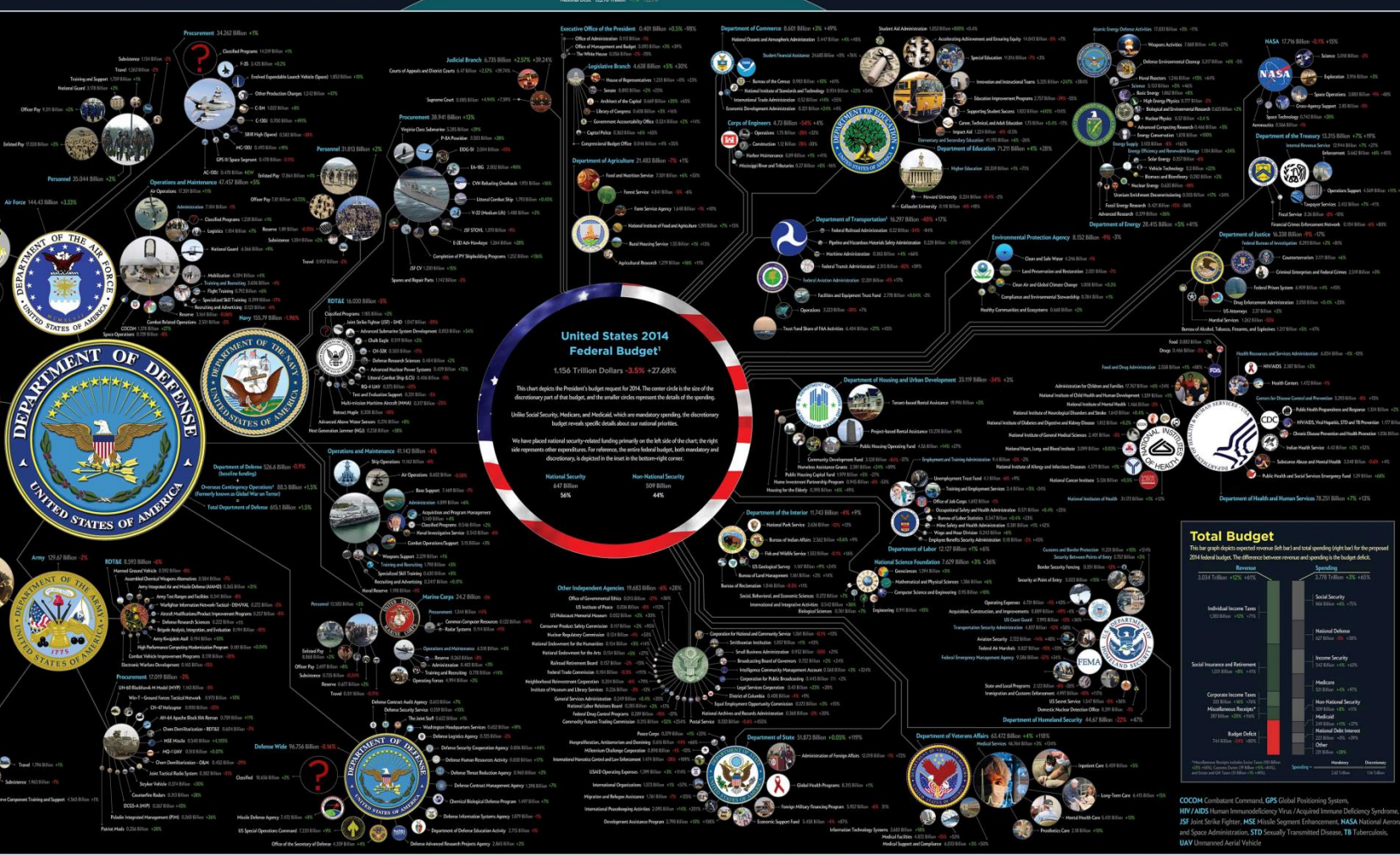
Death & Taxes

A Visual Guide to Where Your Federal Tax Dollars Go

United States 2014 Federal Budget

How to Read the Data

Each item in this chart is a pie chart. The chart works in this way:
The program or department is represented by the size of the circle. The size of the circle is proportional to the amount of money spent on that program or department.
The program or department is represented by the color of the circle. The color of the circle is proportional to the amount of money spent on that program or department.
The program or department is represented by the text next to the circle. The text next to the circle is proportional to the amount of money spent on that program or department.



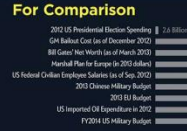
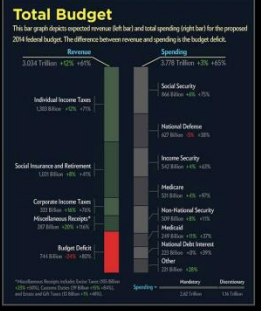
United States 2014 Federal Budget!

1,556 Trillion Dollars $-3.5%$ $-27.6%$

This chart depicts the President's budget request for 2014. The center circle is the size of the discretionary part of the budget, and the outer circles represent the total of the spending. Unlike Social Security, Medicare, and Medicaid, which are mandatory spending, the discretionary budget spends specific dollars on our national priorities.

We have placed national security related items primarily on the left side of the chart; the majority side represents other expenditures for various federal budget, both mandatory and discretionary. It is depicted in the right-to-left direction.

National Security: 56%
Non-National Security: 44%



Footnote 1: A separate chart shows the discretionary budget of \$91 billion and direct spending of \$15 billion will offset on Jan. 1, 2014 if Congress does not enact deficit reduction legislation before that date.
Footnote 2: The 2014 FY 2014 budget for the Department of Transportation is \$14 billion, a total program which is made up of discretionary programs. The \$14 billion budget combines the funding for the 102nd of the US Intelligence Community. Since 2012, the President's agency funding request for the intelligence program has been declined. The agency will have to rely on the 102nd of the US Intelligence Community for its funding.
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Gay rights in the US, state by state

Gay rights laws in America have evolved to allow — but in some cases ban — rights for gay, lesbian and transgender people on a range of issues, including marriage, hospital visitation, adoption, housing, employment and school bullying. The handling of gay rights issues vary by state and follow trends by region

Share 72016
Tweet 2,791
+1 765
Email

- Obama supports same-sex marriage: share with us what it means to you
- Gay rights: five activists reflect on the history of the movement in the US
- President Obama endorses gay marriage

Guardian in America interactive team
guardian.co.uk, Tuesday 8 May 2012 11.12 EDT



Scale states equally

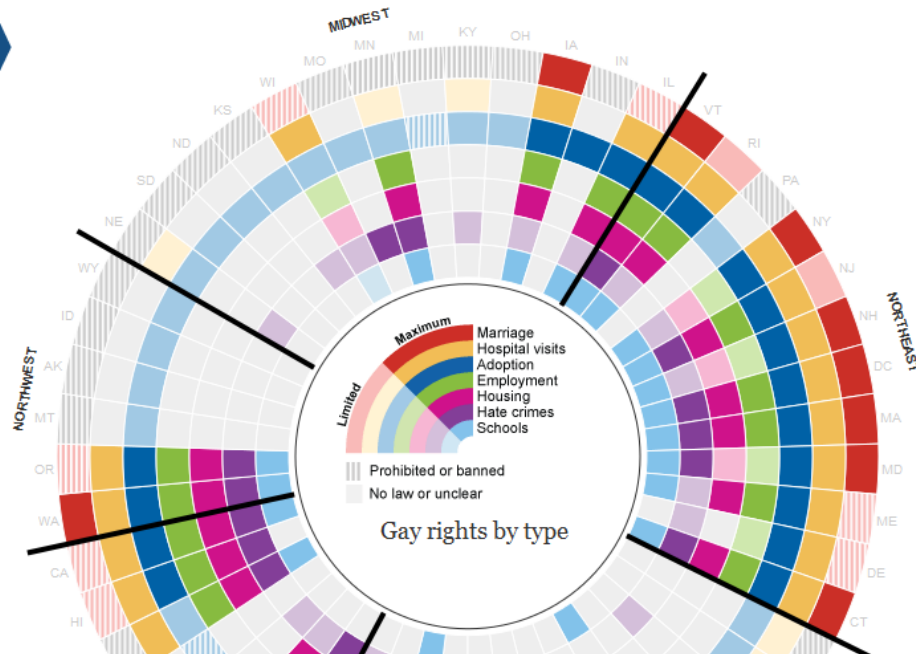
Scale states by population

Where your friends live

Connect to Facebook to see the rights of states where your friends live. Your information will not be saved.

Share your state on Facebook

You are not connected to Facebook.

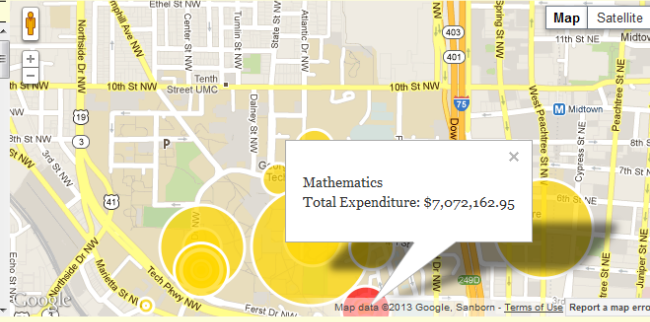


Simply presenting data ***visually*** can have a profound impact

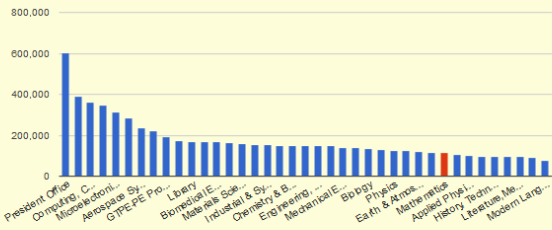
Enter Name Mathematics <All Titles> Salary Range: 10000 - 90000 [Switch to Tree Map View](#)

Top Salaries

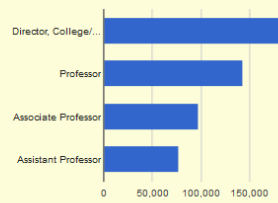
Name	Salary
1 Bunimovich, Leonid	\$225,359.05
2 Thomas, Robin	\$222,102.12
3 Lacey, Michael	\$216,703.30
4 Ulmer, Douglas L.	\$200,000.04
5 Loss, Michael	\$191,046.00
6 Trotter, William T.	\$185,201.28
7 Gangbo, Wilfred	\$180,547.00
8 Chow, Shui-Nee	\$179,998.02
9 Tetali, Prasad	\$175,872.94
10 Dieci, Luca	\$168,207.15



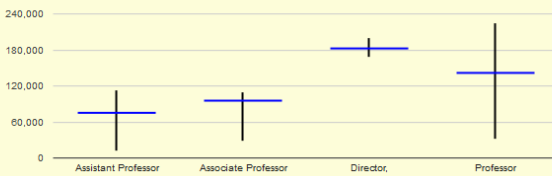
Average Salary by Department



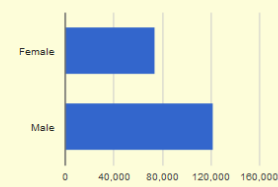
Average Salary by Title



Salary Range By Title



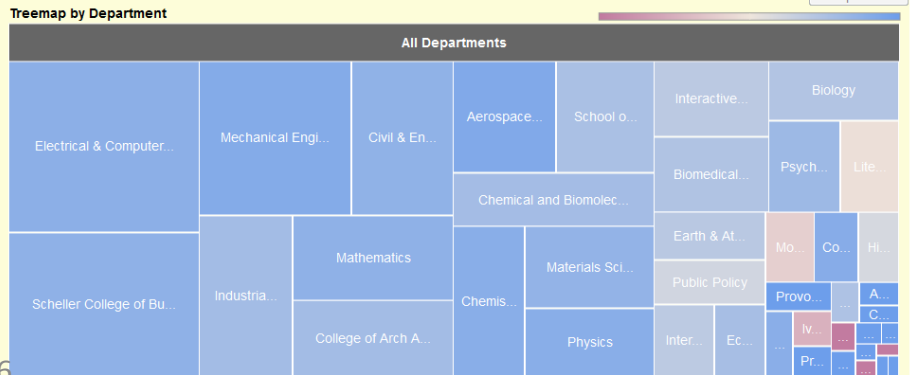
Average Salary by Gender



CS 7450
Fall '12
Design project

Nate Osborne
Nitya Noronha
Ameya Zambre
Pratik Zaveri

Enter Name [Switch to Dashboard](#)



Gun ownership in New York counties

The screenshot shows a Firefox browser window with the URL www.lohud.com/apps/pbcs.dll/article?AID=2012312230056&nclick_check=1. The page features the lohud.com logo and navigation links. The main article title is "The gun owner next door: What you don't know about the weapons in your neighborhood". Below the title is a video player showing a man in a green jacket. To the right of the video is an advertisement for "Green Team" with the text "GET ENERGY FIT TODAY." and a list of three items: 1. Mary Cain breaks 4 national records at Millrose Games, 2. Indian Point evacuation zone needs 5+ hours' report, and 3. State workers with \$100,000 salaries rise 13% in 2012.

The screenshot shows a Firefox browser window with the URL www.lohud.com/interactive/article/20121223/NEWS01/121221011/Map-Where-gun-permits-your-neighborhood-?gcheck=1&nclick_check=1. The page displays a map of Westchester County, New York, with a high density of red pins representing registered pistol permits. The map includes labels for various towns and cities such as New City, Yonkers, and White Plains. Below the map, there is a section for "ROCKLAND COUNTY" which states that permits are issued for life and do not need to be renewed.

http://www.lohud.com/apps/pbcs.dll/article?AID=2012312230056&nclick_check=1

http://www.lohud.com/interactive/article/20121223/NEWS01/121221011/Map-Where-gun-permits-your-neighborhood-?gcheck=1&nclick_check=1

Frequent presentation goals

Clarify

Focus

Highlight

Simplify

May just show a few variables
and/or a subset of the data cases

2. Analysis

Explore the data

Assess a situation

Determine how to proceed

Decide what to do



Many Data Analysis Approaches

Statistics

Database & information retrieval

Data mining

Machine learning



“Contained within the data of any investigation is information that can yield conclusions to questions not even originally asked. That is, there can be surprises in the data...To regularly miss surprises by failing to probe thoroughly with visualization tools is terribly inefficient because the cost of intensive data analysis is typically very small compared with the cost of data collection.”

W. Cleveland

The Elements of Graphing Data

Frequent analysis goals

Show many variables

Illustrate overview and detail

Facilitate comparison

Display may not be easy to
interpret at first

Preconceptions about Visualization Utility

Answering specific questions and accomplishing specific analytic tasks

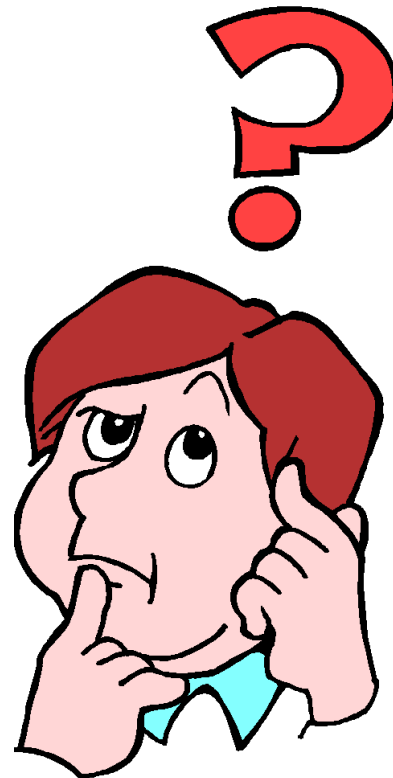
Generating unexpected, serendipitous discoveries and insights

“Finding a needle in a haystack”



Yes, but not what it's best for

So what is visualization most useful for?

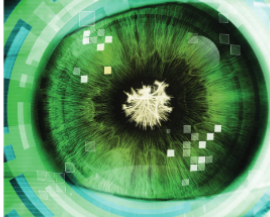


1. Visualization is more than just answering specific questions about data (as is often the case for automated analysis methods); it also facilitates the investigative analysis process, which supports analysts in developing awareness of, learning about, and generating trust in their data, its domain, and its context.

Learning, awareness, trust, context



Investigative analysis

COVER FEATURE


Visual Analytics Support for Intelligence Analysis

Carsten Görg, *University of Colorado*
 Youngh Kang, *Google*
 Zhicheng Liu, *Stanford University*
 John Stasko, *Georgia Tech*

Intelligence analysts must explore and evaluate volumes of data, from narrative recordings of field agents to open source news articles. Insights from visual analytics projects and a hypothetical scenario show the potential of visual analytics to aid these investigations.

Intelligence analysis has been a key application domain for visual analytics since the US Department of Homeland Security created the National Visualization and Analytics Center in 2004. An initial research roadmap described the challenges and goals of this new domain and identified tasks, data, and analytical scenarios focused on homeland security and terrorism prevention. A passage from the roadmap characterizes the grand challenge for visual analytics systems:

The analysis of overwhelming amounts of disparate, conflicting, and dynamic information is central to identifying and preventing emerging threats, protecting our borders, and responding in the event of an attack or other disaster. This analysis process requires human judgment to make the best possible evaluation of incomplete, inconsistent, and potentially deceptive information in the face of rapidly changing situations to both detect the expected and discover the unexpected.

Much of this challenge remains, although visual analytics technologies certainly hold great promise. A few commercial visual analytics tools for intelligence analysis are emerging, such as Analyst's Notebook from IBM (2), www.ibm.com/software/en/industry/12/software, nSpace from Oculus (www.oculusinfo.com/nSpace), and Palantir's suite of systems (www.palantir.com). However, continued progress depends heavily on gaining a deeper understanding of intelligence analysts and the role of an analyst, as well as clarifying how visual analytics can help investigators. These insights must inform any design of any visual analytics system that aims to support intelligence analysts.

The "Investigative Scenarios" sidebar describes the kinds of analysis that are prevalent in the intelligence domain. The scale, diversity, and complexity of the information to be explored make such analyses cognitively demanding. Information is often narrative text, not quantitative data, and as such is not as amenable to automated analysis. Particularly challenging are the "pain points" in the intelligence process—the cost of scanning, recognizing (assessing), and selecting items for further attention; a limited attention span for evidence and hypotheses; and the difficulty of generating alternative hypotheses.³

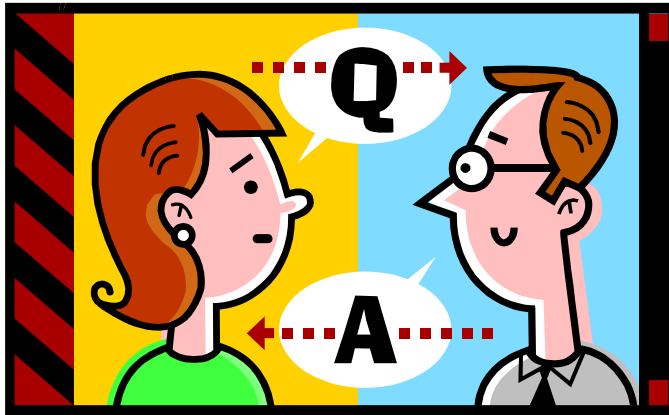
To better understand requirements for visual analytics support, we conducted a series of research projects on intelligence analysis. The projects, which spanned 2008 to 2013, included an observational study to better understand the intelligence analysis process and its characteristics. During this time, we also developed Jigsaw (www.cc.gatech.edu).

30 COMPUTER
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0018-9162/13/531-00 © 2013 IEEE

Görg, Kang, Kiu, Stasko
IEEE Computer '13

2. Visualization, primarily through its interactive capabilities, promotes a dialog of inquiry between analysts and their data by allowing a diverse and flexible set of questions to be asked and answered about a data collection and by spurring the generation of new questions.

Q & A dialog through interaction



Engage in a dialog with your data

1. Select
2. Explore
3. Reconfigure
4. Encode
5. Abstract/Elaborate
6. Filter
7. Connect

1234 IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS, VOL. 13, NO. 6, NOVEMBER/DECEMBER 2007

Toward a Deeper Understanding of the Role of Interaction in Information Visualization

Ji Soo Yi, Youn ah Kang, John T. Stasko, *Member, IEEE*, and Julie A. Jacko

Abstract—Even though interaction is an important part of information visualization (InfoVis), it has garnered a relatively low level of attention from the InfoVis community. A few frameworks and taxonomies of InfoVis interaction techniques exist, but they typically focus on low-level operations and do not address the variety of benefits interaction provides. After conducting an extensive review of InfoVis systems and their interactive capabilities, we propose seven general categories of interaction techniques widely used in InfoVis: 1) Select, 2) Explore, 3) Reconfigure, 4) Encode, 5) Abstract/Elaborate, 6) Filter, and 7) Connect. These categories are organized around a user's intent while interacting with a system rather than the low-level interaction techniques provided by a system. The categories can act as a framework to help discuss and evaluate interaction techniques and hopefully lay an initial foundation toward a deeper understanding and a science of interaction.

Index Terms—information visualization, interaction, interaction techniques, taxonomy, visual analytics

1 INTRODUCTION

Information visualization (InfoVis) systems, at their core, appear to have two main components: representation and interaction. The representation component, whose roots lie in the field of computer graphics, concerns the mapping from data to representation and how that representation is rendered on the display. The interaction component involves the dialog between the user and the system as the user explores the data set to uncover insights. The interaction component's roots lie in the area of human-computer interaction (HCI). Although discussed as two separate components, representation and interaction clearly are not mutually exclusive. For instance, interaction with a system may activate a change in representation. Nonetheless, the two components seem to compose the two fundamental aspects of InfoVis systems, and it seems reasonable to consider what each contributes to an end-user's experience.

We argue that the representation component has received the vast majority of attention in InfoVis research. A cursory scan of a recent conference proceedings or journal issues in the area will uncover many articles about new representations of data sets, but interaction is often relegated to a secondary role in these articles. Interaction rarely is the main focus of research efforts in the field, essentially making it the "little brother" of InfoVis. In other words, it is overshadowed by the more newsworthy representation aspects. A few papers have mainly focused on the interactive aspects of InfoVis (e.g., [10, 15, 25, 47]), but these are relatively uncommon when compared to papers introducing new data representations.

Interaction is an essential part of InfoVis, however. Without interaction, an InfoVis technique or system becomes a static image or autonomously animated images (e.g., InfoCinemas [28]). While static images clearly have analytic and expressive value (e.g., [8, 29, 46]), their usefulness becomes more limited as the data set that they represent grows larger with more variables. Actually, even with a static image such as a poster, a user (or a reader) will often perform several interactions (e.g., rotating the poster, looking closer/further,

and jettisoning down notes on the poster). Spence even suggests the notion of "passive interaction" through which the user's mental model on the data set is changed or enhanced [38]. Finally, through interaction, some limits of a representation can be overcome, and the cognition of a user can be further amplified (e.g., [15, 29]).

The importance of interaction and the need for its further study seem undisputed. For example, the recent book *Illuminating the Path: The Research and Development Agenda for Visual Analytics* calls for further research on interaction:

"Recommendation 3.3: Create a new science of interaction to support visual analytics. The grand challenge of interaction is to develop a taxonomy to describe the design space of interaction techniques that supports the science of analytic reasoning. We must characterize this design space and identify under-explored areas that are relevant to visual analytics. Then, R&D should be focused on expanding the repertoire of interaction techniques that can fill those gaps in the design space." ([45], p. 76)

This recommendation concerns visual analytics which is not equivalent to InfoVis, but the two clearly share much in common and the motivation for this call can equally be applied to InfoVis.

While we believe that few would argue with the merits of the goals in the recommendation, precisely defining what is being called for is not so easy. What does it mean to create a "science of interaction" in visual analytics and InfoVis? The recommendation speaks of developing a taxonomy of interaction techniques and identifying under-explored areas for future research. These are noble efforts, but we believe that a science of interaction also should involve gaining a deeper understanding of the utility and value of interaction in these fields. What does interaction contribute to the analytic process?

For that matter, we might miss questions about the nature of interaction itself. In the context of InfoVis, what is interaction and interactive behavior? Operations such as moving a dynamic query slider [3] to narrow the set of data points being shown or selecting an alternate point in a fish-eye view [19] to change the focus seem like clear examples of interactive behavior. But consider a system where the user selects a menu operation to change from a scatter plot to a parallel coordinates of the data. Is that interaction?

The purpose of this article relates to the recommendation from *Illuminating the Path* that was discussed above. Defining a science of interaction is a lofty goal and we do not purport to do so here, but we do seek to take some initial steps toward that goal. Our objective is to further current understandings of the role that interaction plays

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 For information on obtaining reprints of this article, please send e-mail to: tvrg@computer.org.

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Yi, Kang, Stasko, Jacko
TVCG (InfoVis) '07

3. Visualization rapidly and efficiently facilitates flexible exploration of data to foster both a broad and deep understanding of the information contained therein.

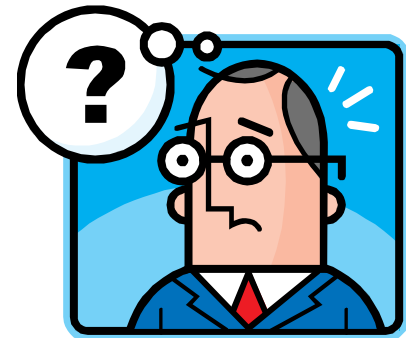
Broad and deep understanding quickly

Visualization most useful in **exploratory data analysis**

Don't know what you're looking for

Don't have a priori questions

Want to know what questions to ask



Visualization of different data types

- Text & documents
- Statistics
- Financial/business data
- Internet information
- Software
- ...

Visualization of different data types

- Text & documents
- Statistics
- Financial/business data
- Internet information
- Software
- ...

Why Visualize Text & Documents?

For what purpose(s)?

Accomplish what tasks?

Help with which problems?

Example Tasks and Goals

- Which documents contain text on topic XYZ?
- Which documents are of interest to me?
- Are there other documents that are similar to this one (so they are worthwhile)?
- How are different words used in a document or a document collection?
- What are the main themes and ideas in a document or a collection?
- Which documents have an angry tone?
- How are certain words or themes distributed through a document?
- Identify “hidden” messages or stories in this document collection.
- Quickly gain an understanding of a document or collection in order to subsequently do XYZ.
- Find connections between documents.

The Challenge

Text is nominal data

Does not seem to map to geometric/graphical presentations as easily as ordinal and quantitative data

- Bar charts, line charts, scatterplots, etc.

“Putting the pieces together”

Jigsaw

Computational analysis of documents' text

Entity identification, document similarity, clustering, summarization, sentiment

Multiple visualizations of documents, analysis results, entities, and their connections

Views are highly coordinated



Academic Papers

Product Reviews


Health Forums

Police Reports

2010 Hyundai Genesis Sedan - Consumer Reviews

[Overview](#)
[Inventory](#)
[Appraise](#)
[Photos](#)
[MPG](#)

More...



Average Consumer Ra ★★★★★ 64 Total Reviews [Write a review](#)

1 of 131 [View all](#)

[Register now!](#) For updates, forums and more!
 [Sign In](#) email or nickname

Text size: **A A A** Accessibility / Privacy Policy / Site Map

View reviews for a specific Genesis model:
[All Genesis models](#)

3 of 3 people found this review helpful

★★★★★

Great value and excellent performance
 By Jayz on 11/30/10 00:00 AM (PST)

Vehicle
 2010 Hyundai Genesis 3.8 4dr Sedan (3.8L 6cyl 6A) 4.6 4dr (4.6L 8cyl 6A)

Review
 After owning 4 LS series Lexus's I decided on a change due to price. Toyota/Lexus was having all the recall problems at the automotive reviews I took a Genesis for a test drive. What I say that the car handles beautifully in all driving conditions, I sound proof cabin. I would highly recommend this car to any sedan like ride at a very affordable price.

Favorite Features
 Solid driving experience. Nicely designed.

Suggested Improvements
 Driver's seat could be a little more comfortable, similar to the seat should be fully powered so it can be raised or lowered.

Recommend [\(3\)](#) [\(0\)](#)

Talk about Autism

Home > Forums

Home

Forums

Latest Posts

Community guidelines

How to use the site

Online Q & A events


News

Support

Members directory

About us

Contact us



Sign up to our community e-news

A safe and friendly online community where you can share expertise and get support and discuss autism

Discussion Forums [Sign in to start](#)

- ▶ **Latest Posts**
The latest posts from the forums.
- ▶ **Introductions**
New to the community? Come and introduce here.
- ▶ **Off Topic**
A place for anything unrelated to autism films, TV, books, holidays, hobbies, etc.
- ▶ **General Autism**
For anything autism-related which isn't sub forums, such as parenting, family technology, communication, and sensory.
- ▶ **Diagnosis**
For discussions and questions related for children and adults.
- ▶ **Education**
For all education-related issues from university.
- ▶ **Adulthood**
For issues such as employment, relationships, benefits, adult responsibilities, etc.

FORT WORTH POLICE DEPARTMENT
WANTED PERSON REPORT

Distribution
 1. Dispatcher-Records
 2. Identification
 3. Detective

Ident. No. _____

Date 2-2-64 Reason Wanted MISSING Offense No. U-91

Name Karen Lynn Bennett Address Unknown Phone Unknown

Color White Sex Female Age 19 Birthdate Unknown Alias Nickname-Little Lynn

Ht. Ft. 5 In. 1 Wt. 115 Hair blond Eye blue Teeth _____ Comp. Pair

Speech or Voice _____ Scar, etc. None

Warrant issued Yes _____ No _____ Warrant No. _____

Wanted By: _____ Department: _____

Reported By: _____ Date: _____ Time: _____

Reported by Mrs. Ruth Welobel Home Ph 126 Relationship Grandmother

4228 W Vickery-We phone

Probable Destination Unknown Last Seen 1228 W Vickery 1-10-64 Time 8:30 PM

Mental Condition Doubtful Cause of Absence Unknown

Wants

Color _____ Year _____ Make _____ Body Style _____

License _____ Year _____ State _____ Number _____ Condition _____

Hair black wool Shoes black heels

Coat _____ Trousers _____

Gloves black Sweater _____ Vest _____ Glasses _____

Shirts white Skirt black cotton Coat _____ Leggings _____ Dress _____

Socks hose Condition of Clothing _____

ADDITIONAL INFORMATION

Jewelry worn-writ watch-make unknown
large diamond ring on left hand
Money carried-Unknown-Subject usually carries large amounts

Subject, Karen Lynn Bennett, came to her grandmother's house on the evening of 1-10-64, and left all of her clothing and property. The subject stayed with her grandmother for a few minutes and then left with a white male, Bruce Carlin, destination unknown. Subject told her grandmother that she would be back the next day to pick up her clothes and items. The subject hasn't returned this day. Mrs. Welobel stated that this is the Little Lynn, the strip-tease artist who worked for Jack Ruby in Dallas. She stated the girl may be somewhere in Dallas at this time. The girl was 1-21 2-2-64 Time 9:40 AM

Located By: _____ Location: _____ Date: _____ Time: _____

36
30900-016
1815

Designing and Implementing an Interactive Scatterplot Visualization for a Tablet Computer

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ABSTRACT
 Tablet computers now offer screen sizes and computing capabilities that are competitive with traditional desktop PCs. Their popularity has grown tremendously, but we are just beginning to see information visualization applications designed for this platform. One potential reason for this limited development is the challenge of designing and implementing a multi-touch interface for visualizations on mobile, tablet devices. In this work, we identify the primary challenges that touch screen interaction poses for information visualization applications. We explore the design space of multi-touch interactions for visualizations and present a prototype information visualization application using a specific technique, a dynamic scatterplot, for an iPad.

Categories and Subject Descriptors
 H.1.1 [Information Interfaces and Presentations]: General

General Terms
 Design, Algorithms, Human Factors.

Keywords
 Information visualization, multi-touch interaction, scatterplot, tablet computer, gesture.

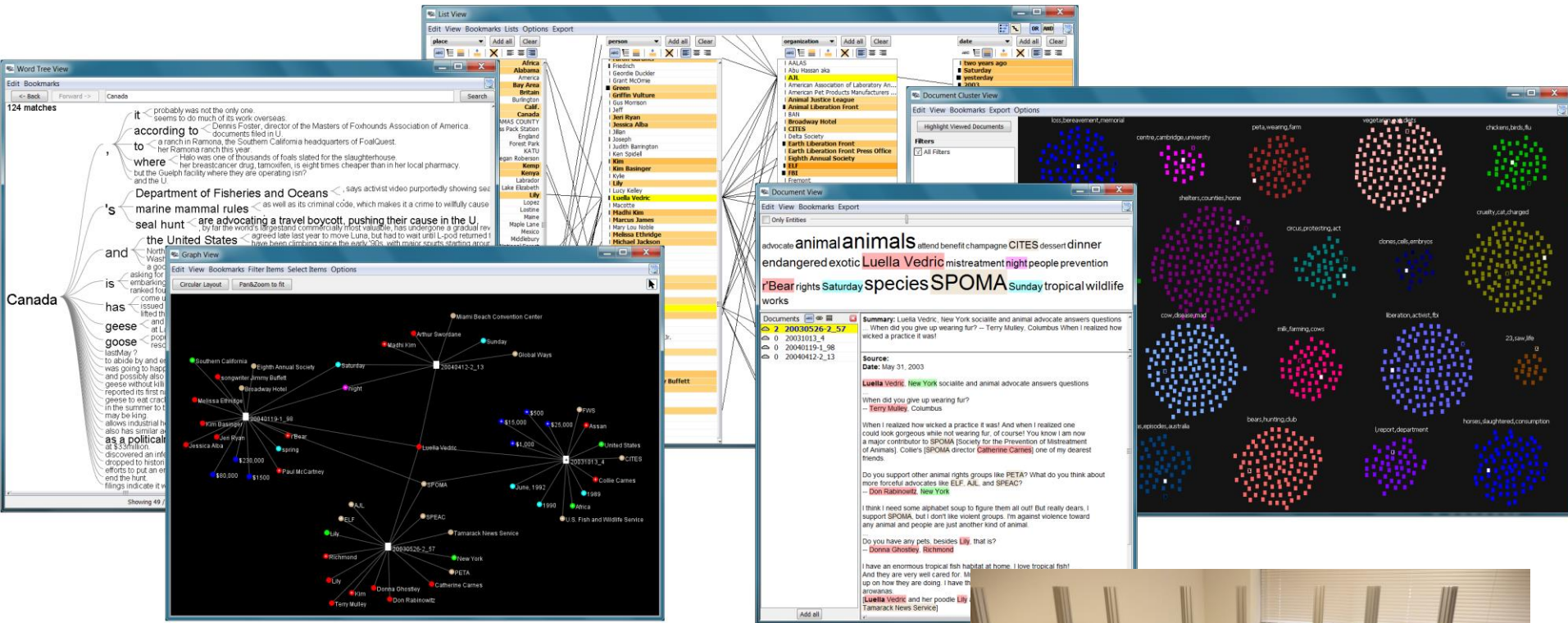
1. INTRODUCTION
 The popularity of tablet computers has grown tremendously in recent years. Devices such as the Apple iPad, Amazon Kindle, and Microsoft Surface continue a significant portion of computer sales today and a wide variety of applications have been tailored to tablet platforms. However, one area with just a few initial applications for tablets is information visualization. Though popular commercial systems such as Tableau and Spotfire have introduced tablet versions in the last two years, these systems still feel much like a port of a desktop application. They do not yet leverage the set of potential interactions that touch-based interfaces provide and do not offer a rich, multi-touch interface in the style of other tablet applications.

We speculate that the limited development of information visualization applications for tablets has resulted from the challenge of designing and implementing the interface. First, most tablets still provide a smaller screen size, which is a limitation for data visualization. Perhaps more importantly, information visualization applications generally have many small visual

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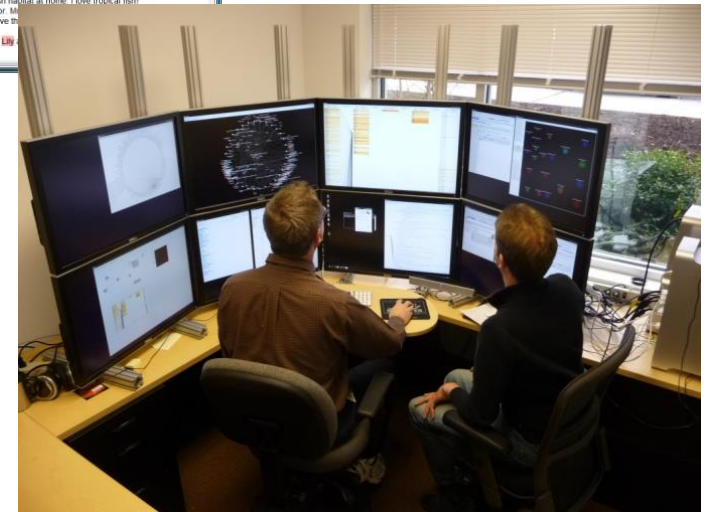
IFT 14, May 17 - 20 2014, Coimbatore, India.
 Copyright is held by the authors. Publication rights licensed to ACM.
 ACM 978-1-4503-5774-0/14 \$15.00.

Jigsaw

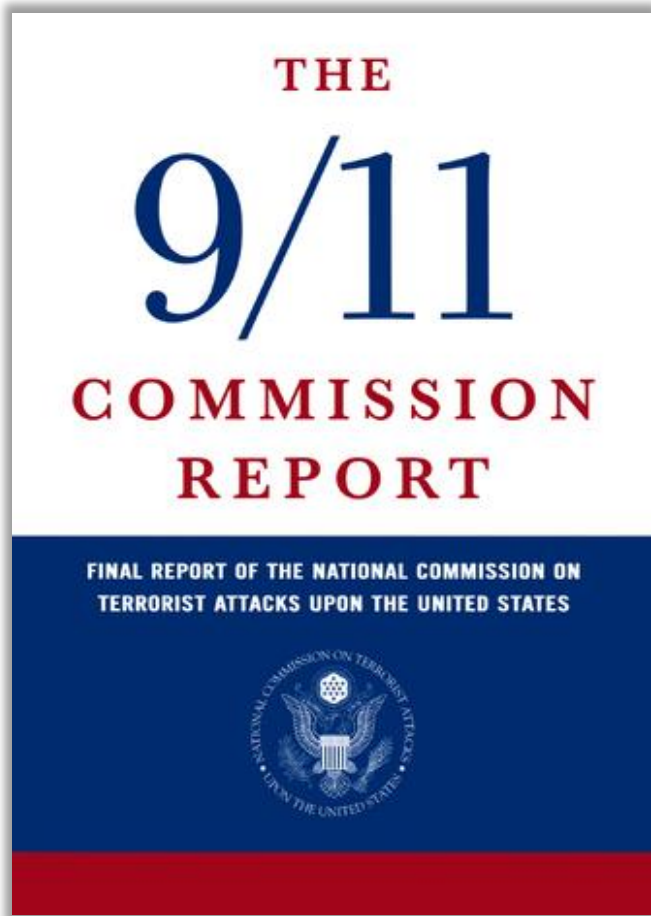


Visual analytics of large text document collections

Görg, Liu, Kihm, Choo, Park, & Stasko
TVCG '13



Example



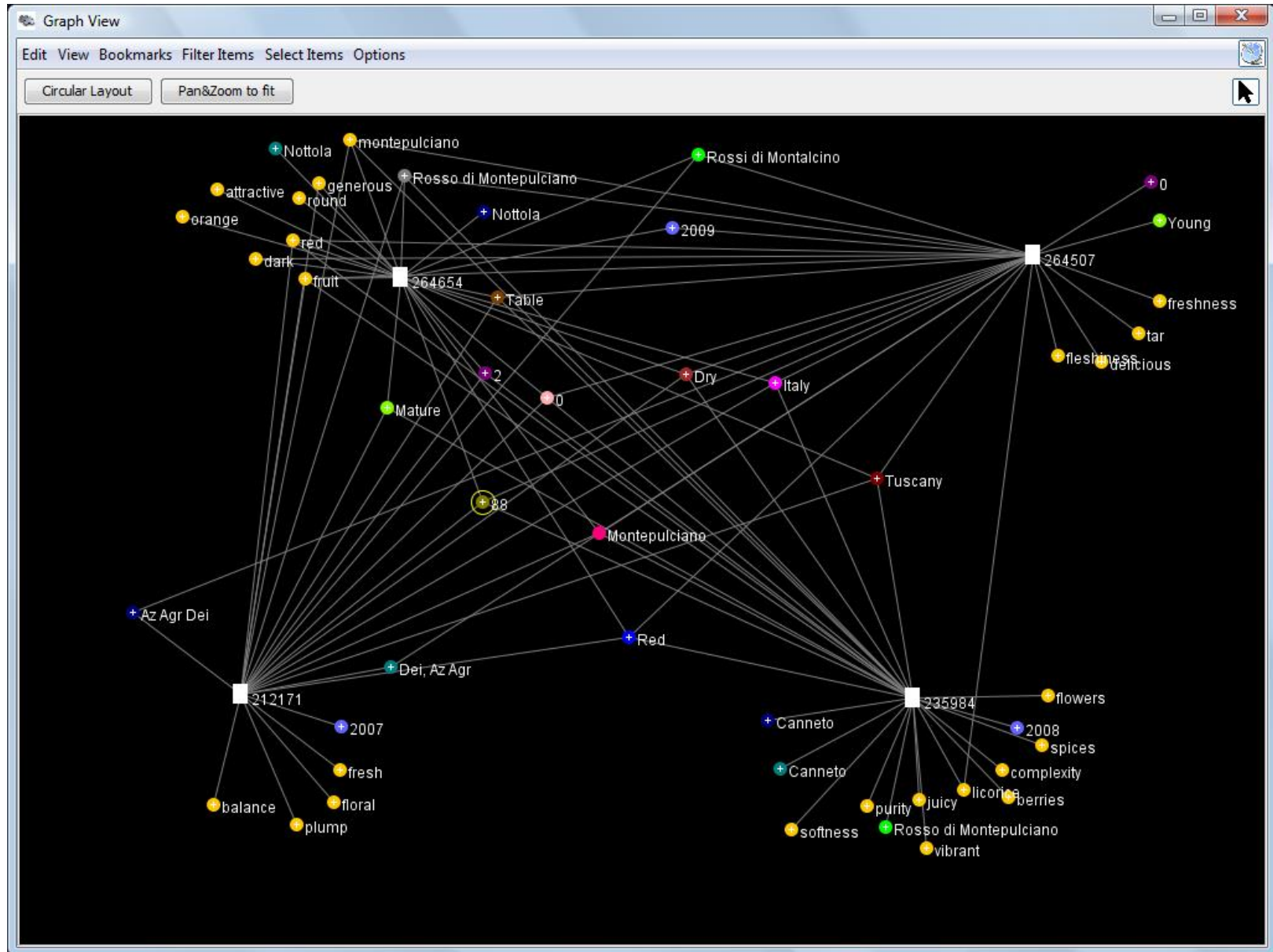
Made each page into a separate “document”

585 in total

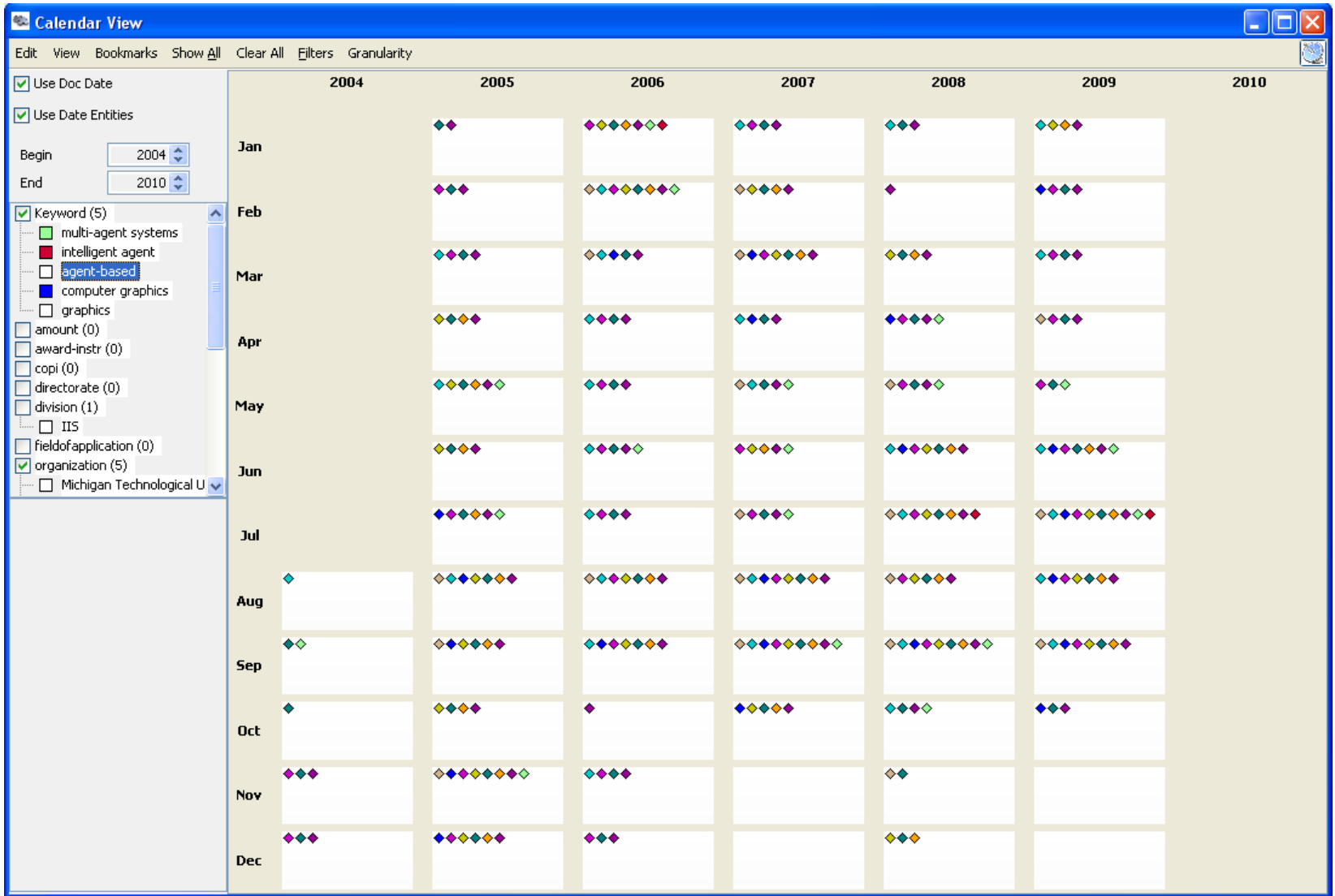
Entities: Person, Location, Organization, Date, Money

Demo

Graph View

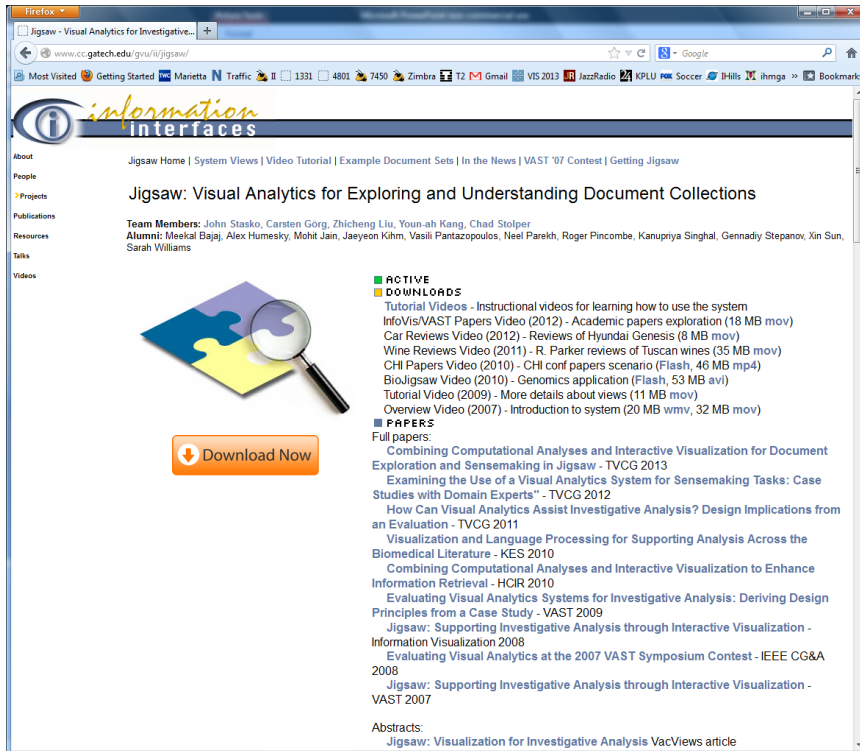


Calendar View

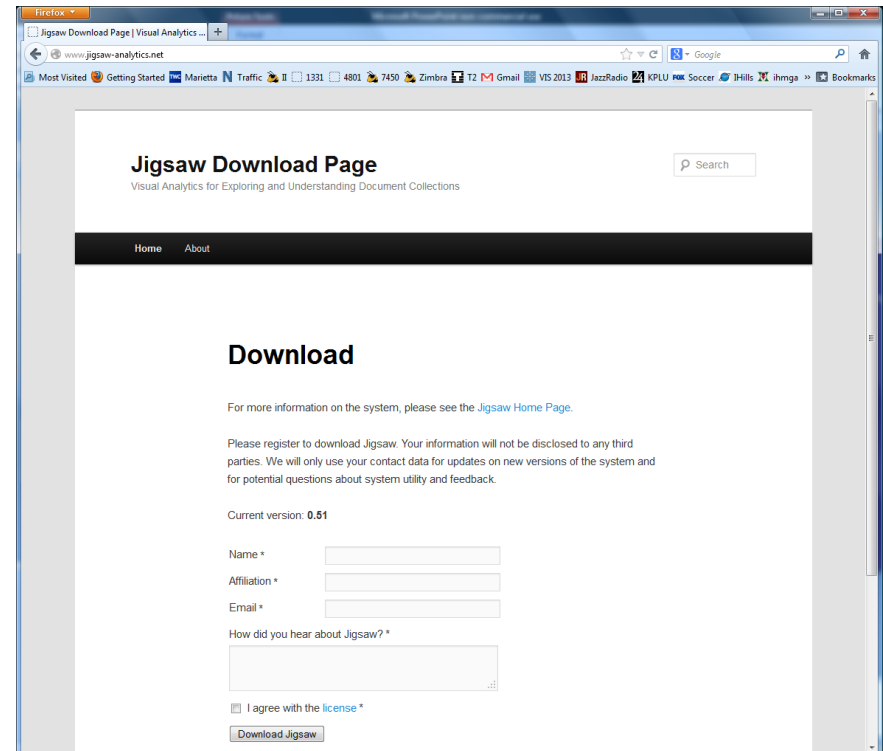


Download for free

<http://www.cc.gatech.edu/gvu/ii/jigsaw>



The screenshot shows the homepage of the Jigsaw system. At the top, there is a navigation bar with the text "information interfaces". Below this, the main heading reads "Jigsaw: Visual Analytics for Exploring and Understanding Document Collections". A sidebar on the left contains links for "About", "People", "Projects", "Publications", "Resources", "Talks", and "Videos". The main content area features a graphic of puzzle pieces with a magnifying glass and a prominent orange "Download Now" button. Below the graphic, there are sections for "ACTIVE DOWNLOADS" and "PAPERS". The "ACTIVE DOWNLOADS" section lists several instructional videos with their respective sizes and formats. The "PAPERS" section lists full papers, including "Combining Computational Analyses and Interactive Visualization for Document Exploration and Sensemaking in Jigsaw - TVCG 2013" and "Examining the Use of a Visual Analytics System for Sensemaking Tasks: Case Studies with Domain Experts" - TVCG 2012.



The screenshot shows the "Jigsaw Download Page". The page has a clean, minimalist design with a search bar at the top right. The main heading is "Jigsaw Download Page" with the subtitle "Visual Analytics for Exploring and Understanding Document Collections". Below the heading, there are navigation links for "Home" and "About". The central section is titled "Download" and contains the following text: "For more information on the system, please see the [Jigsaw Home Page](#)." Below this, it states: "Please register to download Jigsaw. Your information will not be disclosed to any third parties. We will only use your contact data for updates on new versions of the system and for potential questions about system utility and feedback." The current version is listed as "0.51". There are input fields for "Name", "Affiliation", and "Email". A text area is provided for "How did you hear about Jigsaw?". At the bottom, there is a checkbox for "I agree with the license" and a "Download Jigsaw" button.

Applications

- Intelligence & law enforcement
 - Police cases
 - Won 2007 VAST Contest
 - Stasko et al, *Information Visualization* '08
- Academic papers, PubMed
 - All InfoVis & VAST papers
 - CHI papers
 - Görg et al, KES '10
- Investigative reporting
- Fraud
 - Finance, accounting, banking
- Grants
 - NSF CISE awards from 2000
- Topics on the web (medical condition)
 - Autism
- Consumer reviews
 - Amazon product reviews, edmunds.com, wine reviews
 - Görg et al, HCIR '10
- Business Intelligence
 - Patents, press releases, corporate agreements, ...
- Emails
 - White House logs
- Software
 - Source code repositories
 - Ruan et al, SoftVis '10

Further benefits of visualization

Ease of specifying queries

Opportunistic discovery of relevant data

Spurs the generation of new questions

EuroVis '14 Capstone Talk



The screenshot shows a Vimeo video player interface. At the top, the Vimeo logo is on the left, and navigation links for 'Join', 'Log In', 'Create', 'Watch', and 'Upload' are in the center. A search bar is on the right. Below the navigation is a video player with a title card that reads: 'EuroVis '14 Capstone June 13, 2014', 'The Value of Visualization... and Why Interaction Matters', 'John Stasko', 'School of Interactive Computing Georgia Institute of Technology', and 'stasko@cc.gatech.edu'. The video player includes a play button, a progress bar at 1:01:58, and logos for 'Information Interfaces', 'Georgia Tech', and 'College of Computing'. To the right of the video player is a vertical 'MORE VIDEOS' button. Below the video player is a description section with the title 'EuroVis 2014: Capstone: The Value of Visualization...and Why Interaction Matters', a 'vgtc' logo, and text indicating it is from 'VGTCommunity' 1 month ago via 'iMovie'. The description includes an abstract about visualization challenges and interaction. At the bottom of the description are buttons for 'Follow', 'Stats', and 'Download'.

<http://vimeo.com/98986594>



Take Aways

Presentation & analysis

Interaction provides the power

Exploring & developing questions

Acknowledgments

- Work conducted as part of the Southeastern Regional Visualization and Analytics Center, supported by DHS and NVAC and the DHS Center of Excellence in Command, Control & Interoperability (VACCINE Center)



- Supported by NSF IIS-0414667, CCF-0808863 (FODAVA lead), NSF IIS-0915788, NSF IIS-1320537



- Supported by DARPA's XDATA Program

My Research

http://www.cc.gatech.edu/gvu/ii

information interfaces

About: The Information Interfaces Group, an HCI research group in the School of Interactive Computing at Georgia Tech, develops computing technologies that help people take advantage of information to enrich their lives. [More about the lab approach](#)

People: [List of team members]

Projects: [List of projects]

Publications: [List of publications]

Resources: [List of resources]

Talks: [List of talks]

Videos: [List of videos]

Projects

- Jigsaw**
Using visualization and visual analytics to help analysis and sensemaking on text document collections. ACTIVE DOWNLOADS PAPERS
- CiteVis**
Exploring conference paper citation data visually. ACTIVE DOWNLOADS PAPERS
- Touch Interaction**
Developing interaction techniques for visualization on touch-based tablet and mobile devices. ACTIVE PAPERS
- Social Media Visual Analytics**
Helping people analyze and understand social media through interactive visualization and other techniques. ACTIVE PAPERS
- Behavior**
Using visual analytics to help psychologists explore social and communicative behaviors. ACTIVE PAPERS
- Rosemary**
Building novel interactive visualizations without programming. ACTIVE
- SetVis**
Exploring boolean set data through visualization and direct manipulation. ACTIVE DOWNLOADS PAPERS
- Sports Data Visualization**
Visualizing sports data to help people understand, analyze, and predict sporting events. ACTIVE PAPERS
- dotlink360**
Analyzing and exploring converging business ecosystems through visual analytics. ACTIVE PAPERS
- Ploceus**
Supporting flexible network modeling for visual analysis of spreadsheets and databases. ACTIVE PAPERS

Hot News

- In June, John gave the Capstone lecture ([replay](#), [slides](#)) at the **EuroVis 2014 Conference**.
- We presented a paper about our work on touch interfaces for **infovis on tablet computers** at **AVI 2014** in Lake Como, Italy in May.
- This summer, lab students are interning at Microsoft Research, Google, and Twitter, among other places.
- We had papers about **Ploceus** and our study of **visual analytics for intelligence analysis** appear in the first two 2014 issues of the *Information Visualization* journal.
- John was named to be an IEEE Fellow in Jan. 2014.
- In November, John was appointed as an **Honorary Professor in the School of Computer Science** at the Univ. of St. Andrews in Scotland.
- We presented a **paper** about visualizing social and communicative behaviors at **VAHC '13** in November.
- A **journal paper** about how Jigsaw combines computational text analysis with interactive visualization appeared in the Oct. '13 *IEEE TVCG* issue, and was presented at one of the VIS '13 TVCG sessions.

II Lab - Visit our lab
CS 7450 - InfoVis Class
VACCINE Center
FODAVA Center

INFORMATION IS GUSHING TOWARD YOUR BRAIN LIKE A FIREHOSE AIMED AT A TEACUP.

- School of Interactive Computing
-- College of Computing
--- Gvu Center
---- Georgia Tech

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