Storytelling with InfoVis

CS 7450 - Information Visualization
October 12, 2016
John Stasko

Learning Objectives

• Define narrative visualization (vis for storytelling) and explain how it differs from analytic/exploratory visualization
• Name and describe different genres and approaches to narrative visualization
• Explain the style, content, and significance of Rosling's GapMinder video
• View and learn from designs of examples
  – Mariano Rivera, What's Warming World?, Home and Away, Bubble Bust to Recovery, Fallen of WWII, ...
Purpose

• Two main uses of infovis
  – Analysis – Understand your data better and act upon that understanding
  – Presentation – Communicate and inform others more effectively

• Today we look at that second one more

Telling Stories

• Data visualization can help to communicate ideas, summarize, influence, unite, explain, persuade

• Visuals can serve as evidence or support
A Famous Example

Hans Rosling

Gapminder


2006

They Had Him Back

Hans Rosling


2007
Discuss

• Why has this had such a big impact?

InfoGraphics

• See them everywhere today
• Perhaps a good example of infovis for presentation purposes
  – Typically not interactive though

http://www.informationisbeautiful.net/visualizations/left-vs-right-us/
A Lead Paper

- Studied storytelling: Described topics as “Narrative Visualization”
  - How does this differ from traditional forms of storytelling
  - Reviews the design space
  - Characterizes genres
  - Describes a framework

http://www.wired.com/2012/07/you-suck-at-infographics

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<td>Richest and Poorest American Neighbor</td>
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Segel & Heer
TVCG (InfoVis) ’10
Case Studies

755 Steroids or Not, the Pursuit Is On

Design Space Dimensions

- Genre (next slide)
- Visual Narrative Tactics
  - Visual structuring
  - Highlighting
  - Transition Guidance
- Narrative Structure (non-visual mechanisms to assist narrative)
  - Ordering
  - Interactivity
  - Messaging
Genres

Observations

- Clusters of different ordering structures
- Consistency of interaction design
- Under-utilization of narrative messaging
Approach

• Author-driven vs. reader-driven
• Common patterns
  – Martini glass
  – Interactive slideshow
  – Drill-down story
Some Examples

News Stories

Tufte praises the work of Megan Jaegerman at NY Times

http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0002w4
Films

Gore made extensive use of data graphics

Infographics (with a message)

Controversial, see http://soquelbythecreek.blogspot.com/2010/02/what-does-obama-job-chart-really-mean.html

How Mariano Rivera Dominates Hitters
The closer has confused hitters with nearly one pitch: his signature cutter.

http://www.cnn.com/homeandaway

Casualties: Afghanistan vs. Iraq

Showing 2,915 US and Coalition casualties

Location: Countries & US states

Age

Date

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http://www.fallen.io/ww2/
Tableau StoryPoints

Textual narrative, slides with titles as breadcrumbs, element highlighting, and textual annotation on the chart


Dot breadcrumbs, interaction on charts, tooltips, ...


Page scroller, text annotations, rearranging glyphs

http://www.nytimes.com/interactive/2015/01/29/sunday-review/road-map-home-values-street-names.html?_r=0

Dynamic query widget embedded in textual narrative
Steps

Linear steps with much interaction, comments

Animated interaction, tooltips, scrolling
http://www.facesoffracking.org/data-visualization/

Scrolling page with geovis updates

http://mbtaviz.github.io/

Visualizing MBTA Data
An interactive exploration of Boston’s subway system

Mike Sarty and Oran Cost - June 13, 2014

Boston, Massachusetts Bay Transportation Authority (MBTA) operates the 7th busiest subway system in the U.S. after New York, Washington, and Chicago. If you live in or around the city, you may have probably ridden on its. The MBTA recently began publishing substantial amount of subway data through its public APIs. These APIs provide the full metadata to Grouped Travel Forecast Specification (GTFS) which powers Google’s transit directions. This also publishes FareMatrix interactive website and mobile applications for the Red, Orange, Blue, and Green Lines. The following visualizations are data captured from these feeds for the entire month of February, 2014. Green Line data becomes available in October, since it is not shown here. Also, whereas other transit APIs are able to access per minute entry and exit counts at each station measured at the time of day or by passenger count.

Project in WPI infovis class

Scrolling page with many visualizations, much interaction
https://datausa.io/

http://www.r2d3.us/visual-intro-to-machine-learning-part-1/

Design discussion

https://www.youtube.com/watch?v=S4tB6qyxRJA
http://polygraph.cool/films/

http://fivethirtyeight.com/features/gun-deaths/

http://www.georgelmurphy.com/berrics/

http://drones.pitchinteractive.com/


Even the President Goes Interactive

2011 State of Union Address

Side channel data visualizations accompanied speech
Storytelling Scenarios

- Self-running presentations for a large audience
- Live presentations
- Individual or small group presentations
Research Directions

• Storytelling approaches and affordances
  What vis affordances can help guide reader through story?
• Evaluation
  – How to measure effectiveness?
• Memory, context, & embellishments
  – What makes one memorable, and is that good?
• Interaction
  – How to allow without interfering with story?
• Annotations & highlights
  – How to balance text and visualization?
• Learning from other disciplines
  – What can we learn from journalism, choreography, directing, etc.?
• Techniques specific to storytelling
  – Which vis techniques are good matches?
• Stories & collaboration
  – How to facilitate more collaboration?

Data Matters

McCandless Website

http://www.informationisbeautiful.net/

Back to Where We Started

http://www.youtube.com/watch?v=jbkSRLYSojo
Changing Trends

Changes in visualization trends are constantly occurring, with new techniques and tools emerging to help visualize data in more meaningful ways. One trend that has gained popularity recently is the use of interactive and dynamic visualizations. These types of visualizations allow users to explore data in real-time and discover patterns and insights that might not be apparent in static visualizations. For example, interactive maps and data dashboards can be customized to display data in a way that is most relevant to the user's needs.

Questions

- How do these types of visualizations differ from “traditional” infovis?
Questions

- Would you characterize all of these as information visualizations?
  - Consider some of the different examples

My Reflections

- InfoVis for analysis and presentation are different
  - Apples & oranges (both fruit though)

- How?
Resources


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Project Design Document

• Ingredients
  – Clarify the data
  – Objectives, user tasks & queries, ...
  – Designs from your poster and more
  – A suggested design to implement

• Bring 3 copies

Reading

• Explore the data-driven storytelling websites not shown in class
• Watch the videos we didn't show
Upcoming

- Tufte's design principles
- Geospatial visualization