



Animation in InfoVis

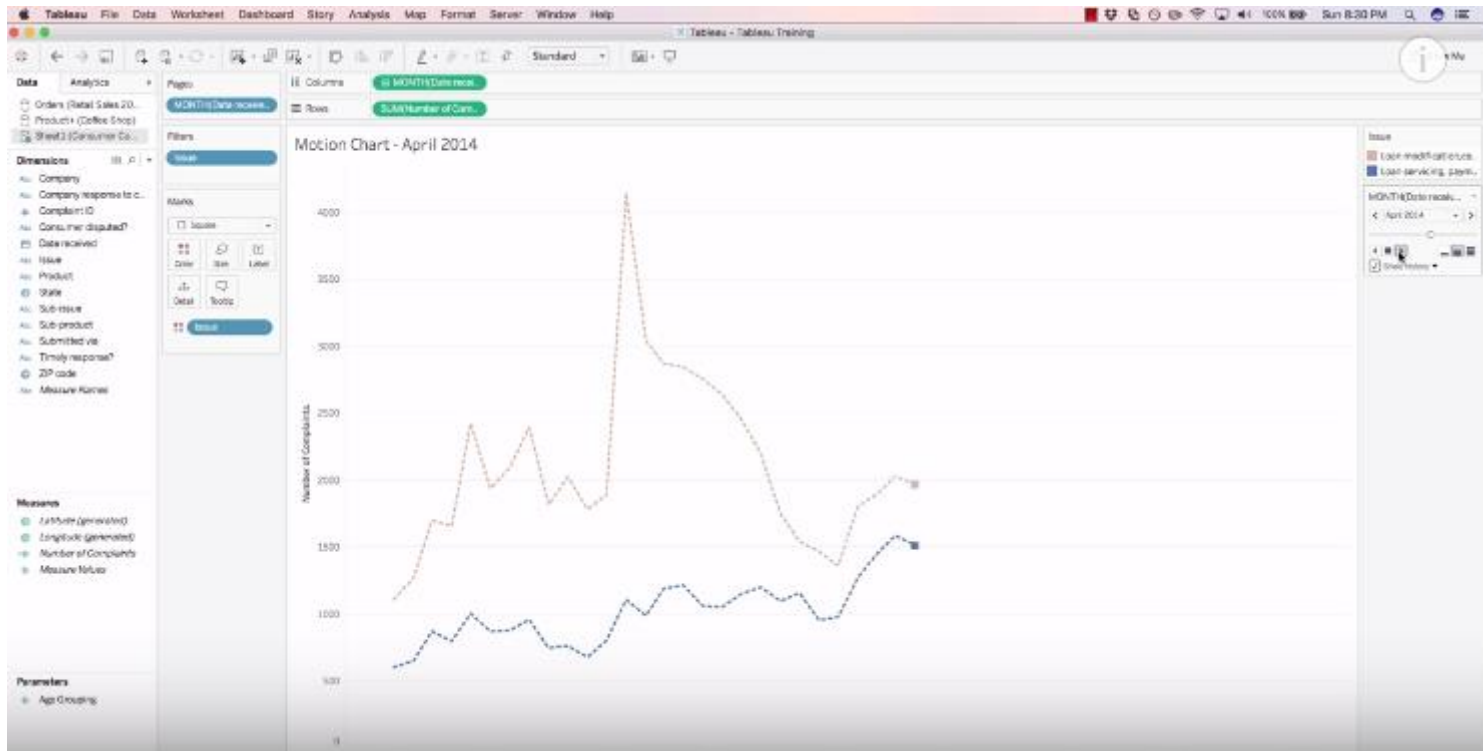
BAIS 6140 – Information Visualization

L. Miguel Encarnaç o

Animation

- What is it?
- Definition
 - Rapid successive display of many display frames where objects change position/appearance gradually so as to create the illusion of continuous movement

Tableau Motion Charts



<https://youtu.be/yxRnk7fE-J0?t=4m18s>

Application

- Where in InfoVis might animation be useful?

Use

- Possibilities

- Use time as an option for space, so can show more data (over time)
- To draw attention to something
- As a visual encoding of particular variable values
- To help transition between views

What We Know

- Perception
 - Animation is a very strong visual attention mechanism
 - It's difficult to focus on other items when animation is nearby

Animation for Transitions

- Can animation help “soften the blow” when a view changes?
- Preserve context, allow the viewer to track where things went

Suite of Transitions (Heer & Robertson, TVCG '07)

- Developed variety of different transitions and applications
- Performed experiments to see how these are perceived

Focus



- What types of animation did they use?
- How did they use animation?

DynaVis

- Implemented in C# and Direct3D graphics
- Let's see it!



<http://www.youtube.com/watch?v=vLk7mlAtEXI>

Transition Types

- View transformation
- Substrate transformation
- Filtering
- Ordering
- Time step
- Visualization change
- Data schema change

Design Principles

*

- Congruence (mental matching)
 - Maintain valid data graphics during transitions
 - Use consistent syntactic-semantic mappings
 - Respect semantic correspondence
 - Avoid ambiguity
- Apprehension (easily perceivable)
 - Group similar transitions
 - Minimize occlusion
 - Use simple transitions
 - Use staging for complex transitions
 - Make transitions as long as needed, but no longer

Key Component

- Staging
 - Animation proceeds in stages, not all at once
 - Varies by animation type and view

Experiments

1. Track object across transitions

- Animation beats no-animation, staged animation better than no staging

2. Estimate changing values

- Animation generally better

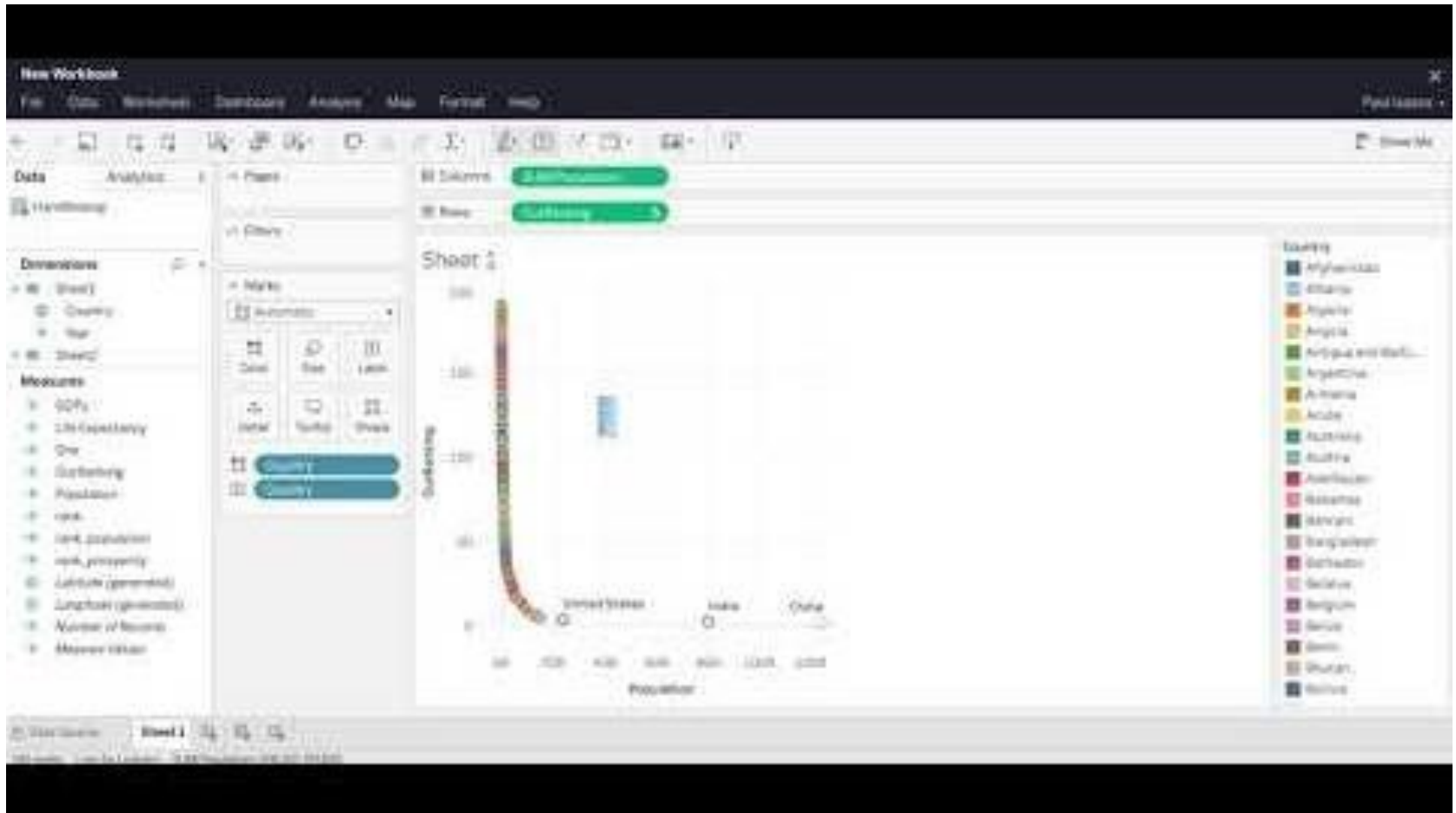
- Subjective

- Staged animation preferred over basic animation preferred over static

It just took 13 years!

New since Tableau 2020.1: Staged Animations

<https://www.tableau.com/about/blog/2020/2/bring-your-data-life-viz-animations>



Storytelling

- Can animation help explain the data?
- One traditional use:
 - Temporal data –Use animation to show changes in time

GapMinder

- Company started by Hans Rosling[†]
 - Purchased by Google
 - Trendalyzer software
- Focus on world data (by country), much about economics and health
- Spotfire-like scatterplot display augmented with animation (animated bubble chart)
- Tells a very compelling story with visualizations

TED Talk 2009

The screenshot shows a web browser window displaying the TED website. The address bar shows the URL https://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen. The page features a large video player with a play button in the center. To the left of the video, the text reads "Hans Rosling: The best stats you've ever seen" and "TED2006 · 19:50 · Filmed Feb 2006". Below this, it says "48 subtitle languages" and "View interactive transcript". To the right of the video, there are icons for "Add to list", "Like", "Download", and "Rate". Below the video player, there is a section titled "Share this idea" with icons for Facebook, LinkedIn, Twitter, Link, Email, and Embed, followed by the view count "11,633,922 Total views". At the bottom, there is a quote: "You've never seen data presented like this. With the drama and urgency of a sportscaster, statistics guru Hans Rosling debunks myths about the so-called 'developing world'." and a small red box containing the word "Public".

Hans Rosling:
The best stats you've ever seen
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TED Talks are free thanks to our partners & advertisers

Public

https://www.ted.com/talks/hans_rosling_at_state

Why is it so compelling?

- Did the animation really add value to the visualizations?
- Was it Rosling's speaking that makes it compelling?
- More on Storytelling later...

Reflections



- Should animation be used more in information visualization?
- Where?

Empires decline



<http://www.youtube.com/watch?v=EwOA8AfeHM4>

Interesting InfoViz Animations

2015 Ebola Outbreak

<http://www.who.int/csr/disease/ebola/photos/animated-map-med-january-2016.gif>

Human Migration

<https://www.dnalc.org/view/15892-Human-migrations-map-interactive-2D-animation.html>

Atlantic slave trade

http://www.slate.com/articles/life/the_history_of_american_slavery/2015/06/animated_interactive_of_the_history_of_the_atlantic_slave_trade.html

Christianity development over the years

<http://www.ed.ac.uk/divinity/research/resources/animated-maps>

Unusual maps (world wealth, US settlement, right to bear arms)

http://subdude-site.com/WebPics/WebPicsMaps/WebPicsMaps_dir.htm

How to animate in Tableau

MotionCharts

<https://youtu.be/yxRnk7fE-J0?t=4m18s>

Replicating Hans Rosling's 2006 TED talk

<http://www.edupristine.com/blog/animation-in-tableau>

Animating maps

<https://public.tableau.com/en-us/s/blog/2014/08/capturing-animation-tableau-maps>