

Data Visualization

For Joanna

R.W. Oldford

University of Waterloo

Outline

References

Where did the images come from?

Some references (all data viz images including word cloud are mine)

My homepage <http://sas.uwaterloo.ca/rwoldfor/>

My Youtube Channel (look at the movie Visualizing Data, a few examples, which you might want to use)

<http://www.youtube.com/playlist?list=PL42D4DEADE076E33C>

<http://encyclopedia2.thefreedictionary.com/information+visualization>

http://rsd.gsfc.nasa.gov/rsd/images/Fran19960904rendered_lg.jpg

<http://encyclopedia2.thefreedictionary.com/information+visualization>

<http://www.designworldonline.com/uploads/ImageGallery/2nascar.jpg>

<http://informationarchitects.net/blog/web-trend-map-4-final-beta/>

A Definition

Visualize

- **visualize** (ˈvɪzjuː@lɪz, ˈvɪz-), **v.** Also **visualise**. [f. visual a. + -ize.]
 1. *trans.* To form a mental vision, image, or picture of (something not visible or present to the sight, or of an abstraction);
 2. *absol. or intr.* To form a mental picture of something not visible or present, or of an abstract thing, etc.; to construct a visual image or images in the mind.
 3. *trans.* To render visible.
- **visualized** ppl. a., made visual or visible to the mind; formed in the mind;

Oxford English Dictionary

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A Definition

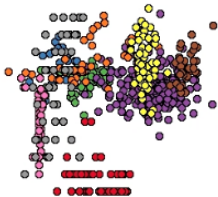
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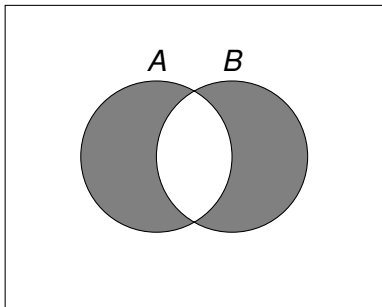
Oxford English Dictionary

Some pictures

A pdf (could also have been a .png, .jpg, etc.):

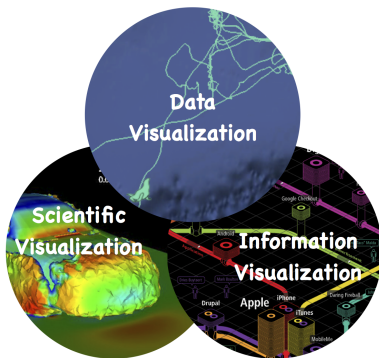


A .mov (could also have been a .avi , etc.). Use Adobe, not Mac's Preview (and you will have to tell it to "trust" the document source).



Data Visualization

One slide attempt 1



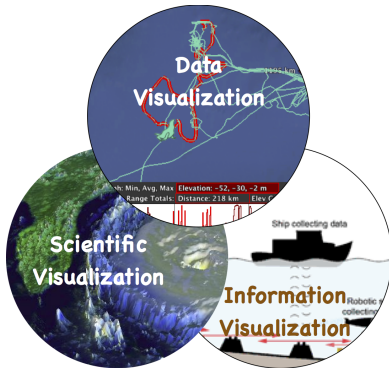
Data Viz: display of empirical data (i.e. measurements) – seal paths

Sci Viz: display of model data (e.g. simulation of dynamical systems) – nascar turbulence

Info Viz: display of information (e.g. object relations) – web trends 2010

Data Visualization

One slide attempt 2



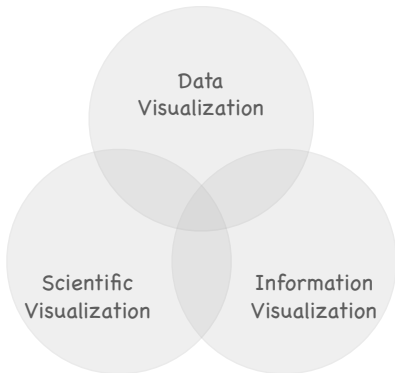
Data Viz: display of empirical data (i.e. measurements) – seal path and elevation

Sci Viz: display of model data (e.g. simulation of dynamical systems) – hurricane circulation simulation

Info Viz: display of information (e.g. object relations) – explaining OTN measurements

Data, Scientific, and Information Visualization - what's the diff?

Sequence of slides



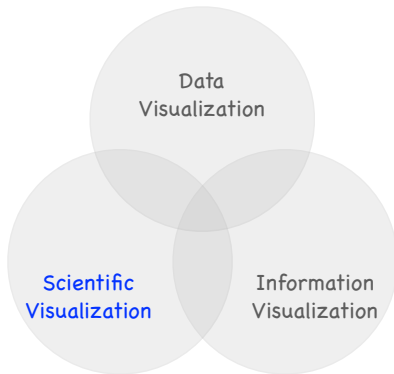
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations)

Scientific Visualization - what is it?

Sequence of slides



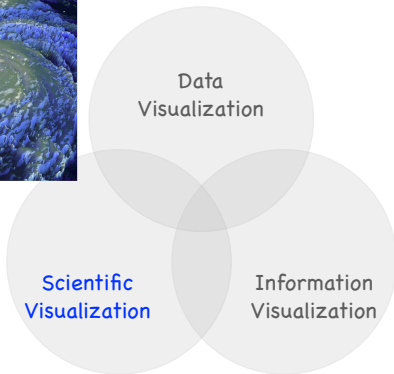
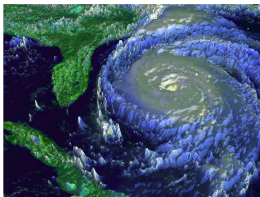
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Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations)

Scientific Visualization - what is it?

Sequence of slides



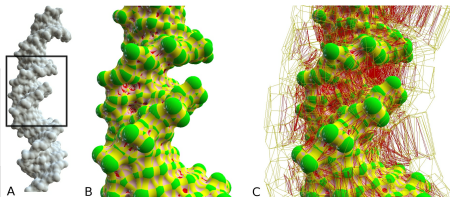
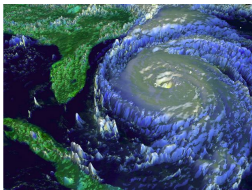
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models) – circulation models

Info Viz: display of information (e.g. object relations)

Scientific Visualization - what is it?

Sequence of slides



Scientific
Visualization

Information
Visualization

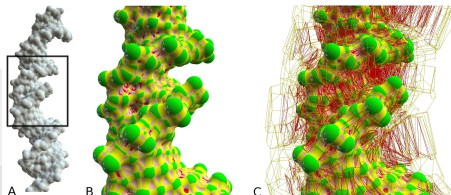
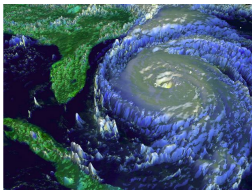
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models) – molecules

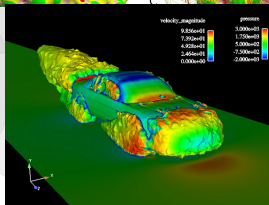
Info Viz: display of information (e.g. object relations)

Scientific Visualization - what is it?

Sequence of slides



Scientific
Visualization



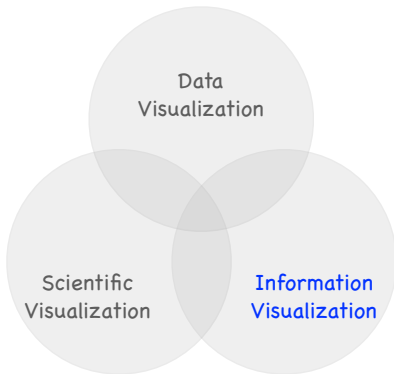
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models) – nascar turbulence

Info Viz: display of information (e.g. object relations)

Information Visualization - what is it?

Sequence of slides



Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations)

Information Visualization - what is it?

Sequence of slides



Data
sualization

Information
Visualization

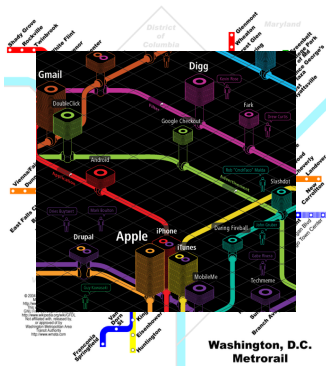
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations) – Transportation Map

Information Visualization - what is it?

Sequence of slides



Data
sualization

Information
Visualization

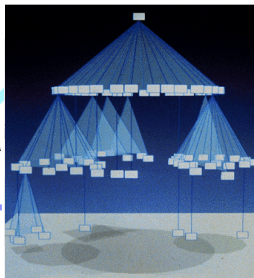
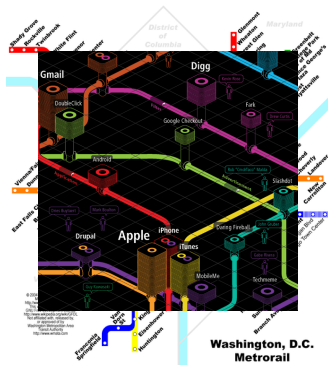
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations) – Web Trends as a transportation Map

Information Visualization - what is it?

Sequence of slides



Information
Visualization



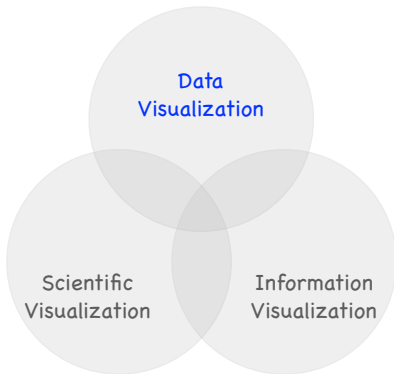
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations) – Word clouds showing frequencies of words (here Tukey's famous "The Future of Data Analysis" paper)

Data Visualization - what is it?

Sequence of slides



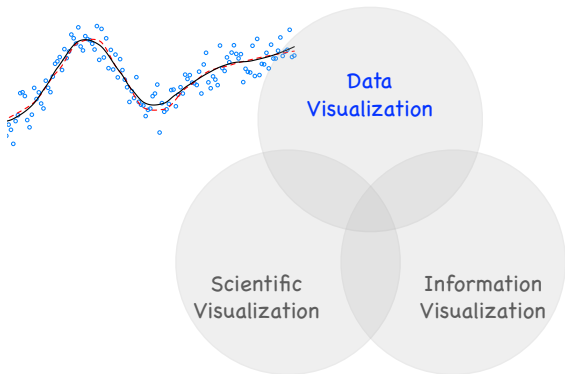
Data Viz: display of empirical data (i.e. measurements)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

Info Viz: display of information (e.g. object relations)

Data Visualization - what is it?

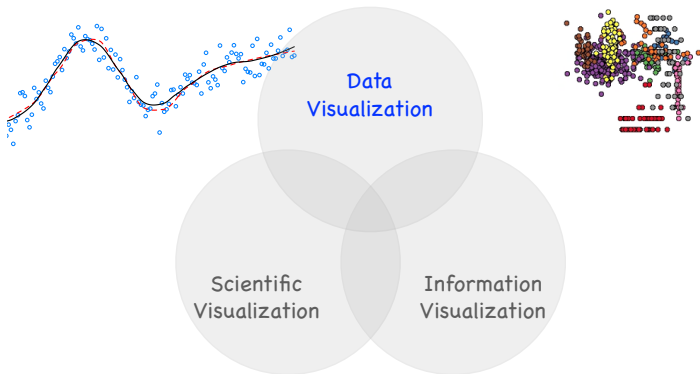
Sequence of slides



Data Viz: display of empirical data (i.e. measurements) – data and statistical models
Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)
Info Viz: display of information (e.g. object relations)

Data Visualization - what is it?

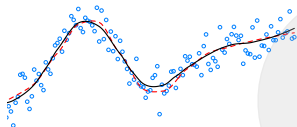
Sequence of slides



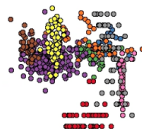
Data Viz: display of empirical data (i.e. measurements) – discovering high dimensional data structure
Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)
Info Viz: display of information (e.g. object relations)

Data Visualization - what is it?

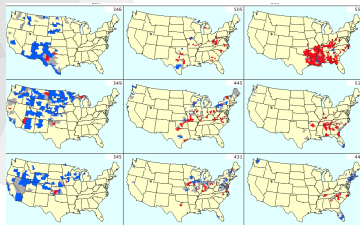
Sequence of slides



Data
Visualization



Scientific
Visualization



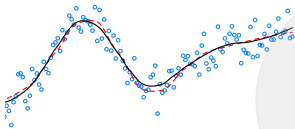
Data Viz: display of empirical data (i.e. measurements) – spatial data (here visual anova analysis of lung-cancer in USA)

Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)

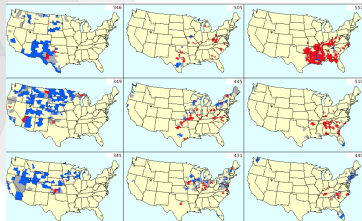
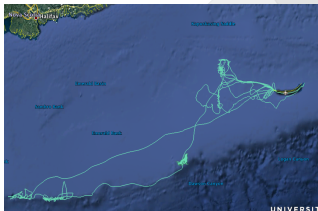
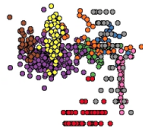
Info Viz: display of information (e.g. object relations)

Data Visualization - what is it?

Sequence of slides



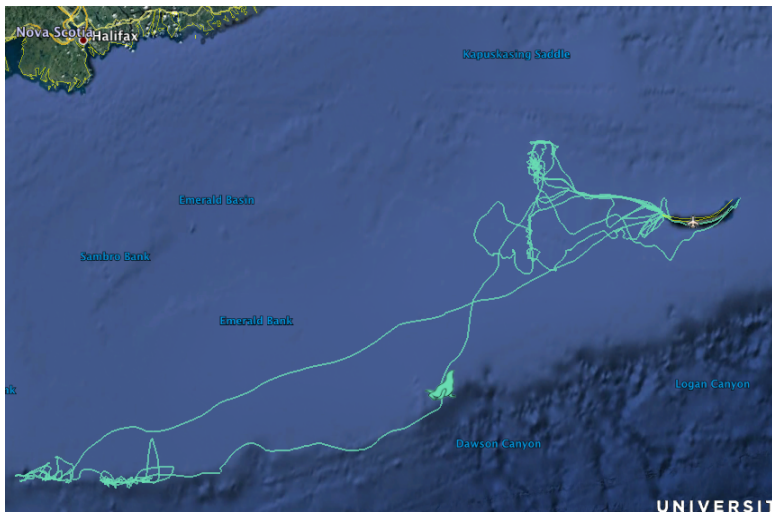
Data
Visualization



Data Viz: display of empirical data (i.e. measurements) – marine mammal behaviour (here along continental shelf)
Sci Viz: display of model data (e.g. simulation of dynamical systems, physical models)
Info Viz: display of information (e.g. object relations)

Seal data

Shelf Seal Path



Seal data

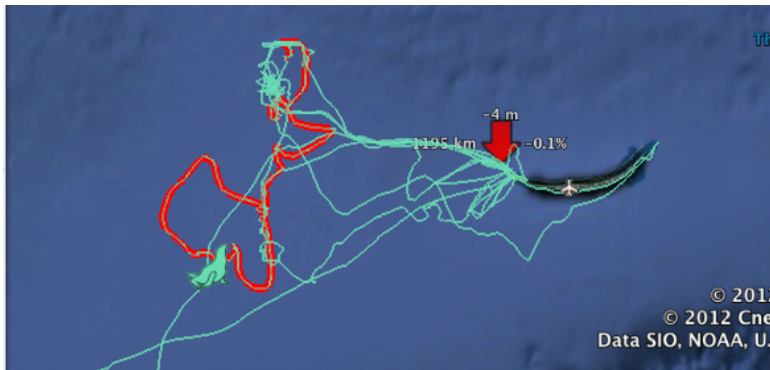
Shelf Seal Animation

Seal data

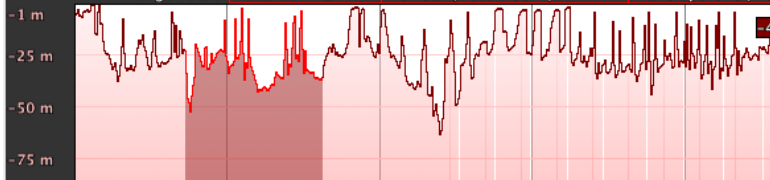
Shelf Seal Animation and Path

Seal data

Shelf Seal Path and Elevation Profile



Graph: Min, Avg, Max **Elevation: -52, -30, -2 m**
Range Totals: **Distance: 218 km** **Elev Gain/Loss: 258 m, -272 m** **Max Slope: 0.4%, -0.1%**



Seal data

All Seals Animation

Seal data

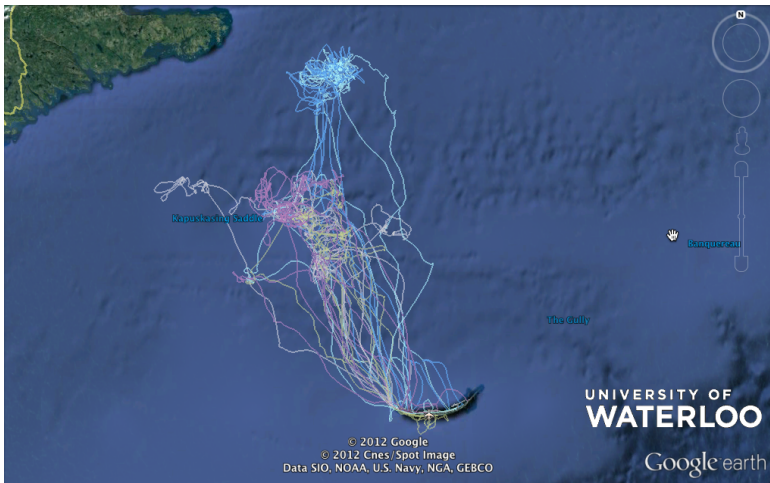
All Seals Animation – with trail of lags

Seal data

All Seals Animation – with paths

Seal data

North South Seal Paths



Seal data

North South Seal Paths and Animation

Seal data

One North South Seal's Path and Elevation

Seal data

One North South Seal's Path and Elevation

