

# FIT3179 Data Visualisation

Week 11: Interactive Data Visualisation



## Lecture Overview

- Why add Interactivity in visualisation?
- Manipulation and change: Munzner textbook chapter 11

- Required reading:
  - Textbook *Visualization Analysis and Design*: **Chapter 11: Manipulate View**
- Optional readings:
  - Heer and Robertson, 2007, Animated Transitions in Statistical Data Graphics

With big datasets, there is too much data to present easily

Visualisation experts noted this and considered different ways to address the problem. *Ben Shneiderman (1996)* suggested that data should be visualised with:

*“Overview first, zoom and filter, then details-on-demand”*

This is Shneiderman’s mantra. Read VAD, section 6.7.

We add interactivity to make data easier to understand.

We can also use interactivity to improve the *story* of the data.

- Generally we want to add interactivity because:
  - Reduce the cognitive load of the user
  - To cater for extra dimensions in the data
  - To more easily facilitate macro/micro readings
  - To add extra meaning
    - Narrative for the user
    - Information discovery

- Cognitive load is when we have to process more than our brain can really handle (VAD 6.5.1)
  - Our long-term memory is very good and unlimited, but our working-memory (or short-term memory) is very limited.
  - Once the cognitive load (or working-memory) is exceeded, the user loses ability in decision making and knowledge acquisition.
- Focus and context principles can help us to deal with this
  - Reducing the number of unique elements and allow the user to group items helps.
- Visualisations in general allow us to tap into visual thinking (VAD 6.5)
  - Munzner describes this as ‘eyes beat memory’
  - Change blindness (VAD 6.5.3)

- To cater for extra dimensions in the data
  - Sometimes there are too many dimensions to a data set to display nicely
  - For example, you may have values for things, but also have a time dimension
  - Interactivity may allow you to scroll through time to see changes

- To more easily facilitate macro/micro readings
  - Macro readings should always be evident
  - However micro readings may be difficult
  - Interactivity can allow exploration of data of the viewers interest
  - They can create their own secondary narratives and draw their own meanings



- To add extra meaning
  - Interactivity may also draw out extra meaning to data
  - It might allow data difficult to make meaning be more easily accessible
  - It may also juxtapose data in a different way
  - Moving things around on a visualisation for example may allow different comparison to happen

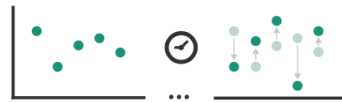
- [Google Maps](#)
- <http://www.gapminder.org/tools/>
- <http://caleydo.org/tools/lineup/>
- <http://usmigrationflowmapper.com>
- <http://www.poppyfield.org/>
- <http://co2.digitalcartography.org/>
- <http://britains-diet.labs.theodi.org>
- [http://www.nytimes.com/interactive/2014/06/05/upshot/  
how-the-recession-resaped-the-economy-in-255-  
charts.html?\\_r=0&abt=0002&abg=0](http://www.nytimes.com/interactive/2014/06/05/upshot/how-the-recession-resaped-the-economy-in-255-charts.html?_r=0&abt=0002&abg=0)

- What can be changed with interactivity?
- Can these changes be grouped?
- How can a selection be
  - created?
  - manipulated?
  - visualised?
- What types of navigation exist?
- > Munzner textbook chapter 11

# Manipulate View: Textbook chapter 11

## Manipulate

### ② Change over Time



### ② Select



### ② Navigate

#### → Item Reduction

→ Zoom  
*Geometric or Semantic*



#### → Pan/Translate



#### → Constrained



#### → Attribute Reduction

##### → Slice



##### → Cut



##### → Project

