

# Web Mapping & Analysis

## Interactivity

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# Today

- Interactiviy
- Interactive (Web) Maps
- Interactivity building blocks

# Interactivity

# Interactivity: *what*

*“[...] two-way flow of information, [...] responding immediately to the latter’s [user’s] input”*

(OED)

- Ability to dynamically modify a visualisation
- Action/response as part of the experience

# Interactivity: *why*

Munzner (2016):

- Handle complexity
- Cause the view to change
- Support investigation at multiple levels of detail
- Expand the capabilities of vis (many *idioms* depend on it)

# Interactivity: *when*

*“[when] seeing the dataset structure in detail is better than seeing only a brief summary of it”*

Munzner (2016)

- Too much to visualise all at once
- Both “big picture” *and* “detail” matter

# Interactive (Web) Maps

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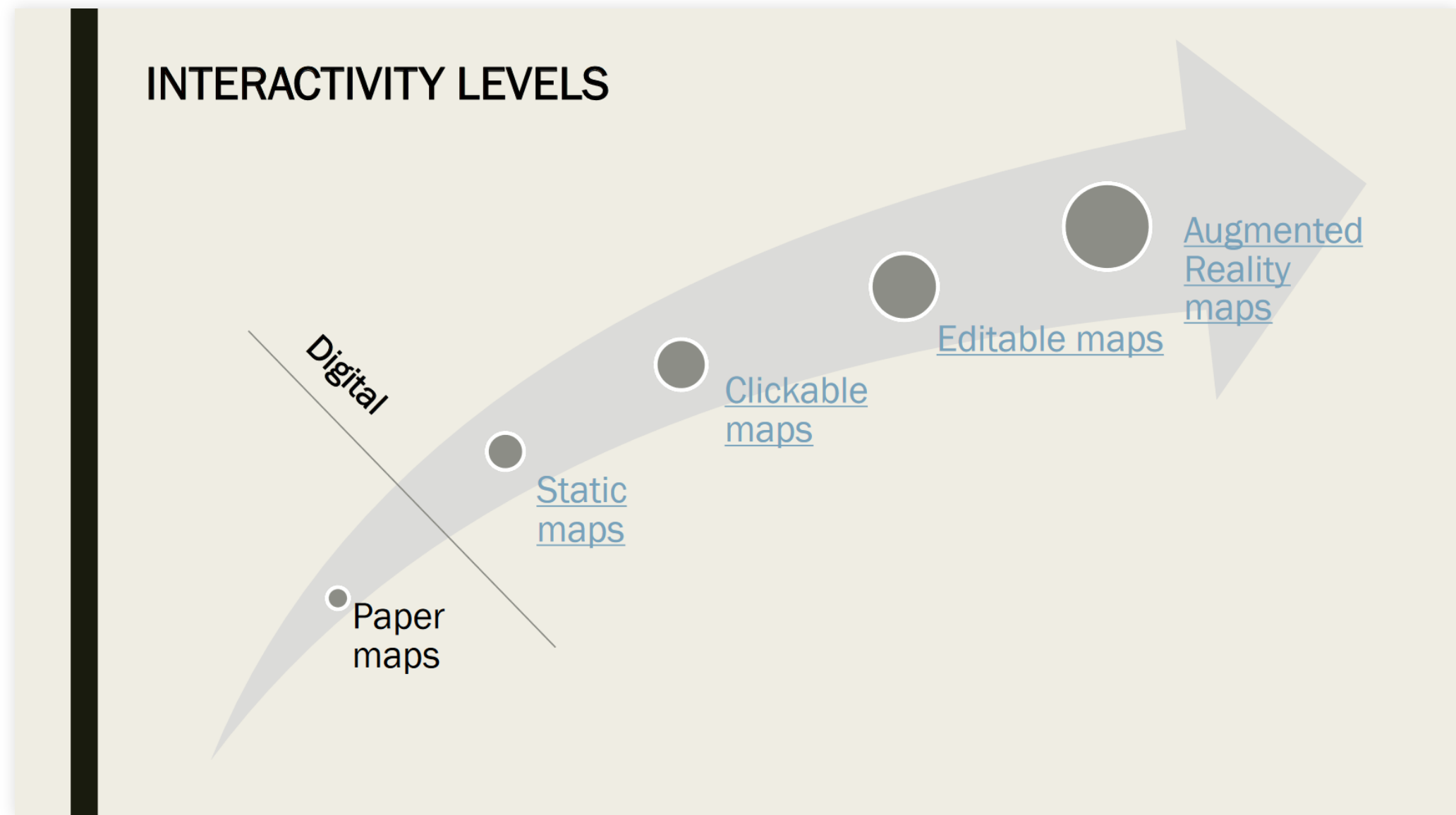


Image: A. Calafiore



# Interactive (Web) Maps

- Efficient medium for high information throughput (Tufte)
- *Maps as “windows”* into large datasets
- “A map of many maps”

# Interactivity Building Blocks

# Interactivity Building Blocks

- Filtering
  - Pan
  - Zoom
  - Subset
- Perspective
- Volume
- Tooltips
- Split
- Animate

# Filtering

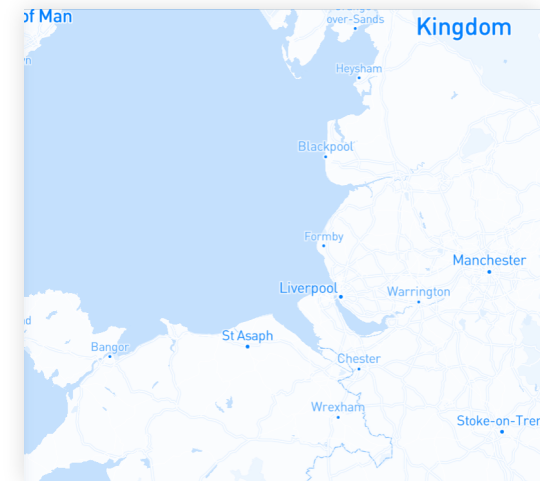
- Widely used design choice in visualisation
- Reduction of the set of elements being displayed
- Discard geographically or attribute-based

# Filtering: Pan

**What** “Travel” *within* a single scale

**Use** Segment a map geographically

**Abuse** Map is meant to focus on a single region



Mapbox

# Filtering: Zoom

**What** “Travel” *across* scales

**Use** Present different degrees of detail

**Abuse** Map is meant to focus at a single scale



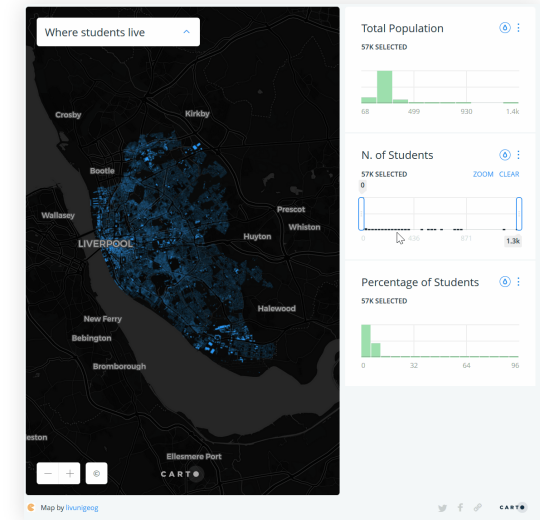
Mapbox

# Filtering: Subset

**What** Restrict data showed (by attribute)

**Use** Explore patterns by value/category

**Abuse** Focus is on the global pattern



GDSL

# Perspective

**What** Modify the user's point of reference

**Use** Different perspective fits the purpose of the map (e.g. car navigation)

**Abuse** Feature size matters



Kepler.gl



# Volume (3D)

**What** Add a (pseudo-)third dimension for display

**Use** Volume is relevant(e.g. height)

**Abuse** Almost any other case



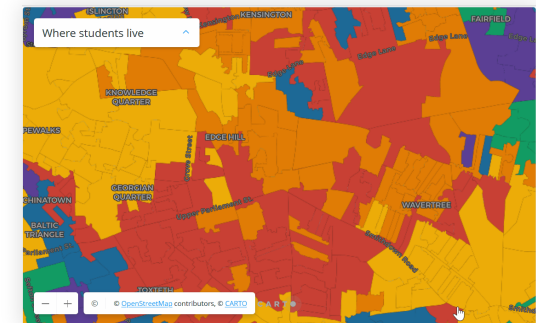
Kepler.gl

# Tooltips

**What** Contextual (non-geo)  
information on-demand

**Use** Let the user explore feature  
(multi-media) attributes

**Abuse** Include more data than  
required in the tooltip



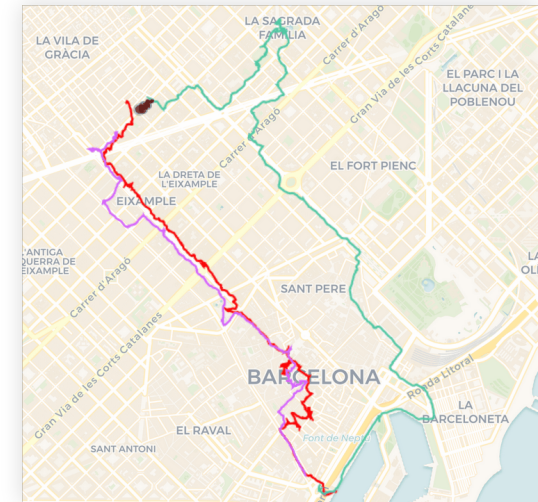
Carto

# Animate

**What** Add temporal dimension through compilation of slices

**Use** Explore space-time patterns

**Abuse** Communicate cross-sectional insights



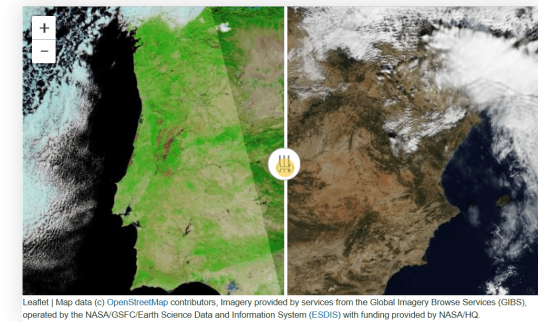
Carto

# Split

**What** Overlay two maps of the same location

**Use** Compare overall pattern changes

**Abuse** When you need to view same location in both maps



**ipyleaflet**

# General tips

- Think about the **experience** first, then consider the **technology**
- Avoid *feature creep*
- “Interactive” is not a binary



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