Web Mapping & Analysis Good (Web) Maps

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Today

- Visualisation
- (Web) Maps
- Choropleths

Contributed Links

Visualisation

What?

"Visual representations of datasets designed to help people carry out tasks more effectively"

Munzner (2016)

When?

A human "superpower":

- *Keep* the human in the loop
- Augment memory/internal representation
- *Ask* new questions rather than only *answer* existing ones

Why?

- Bridges human and machine
- Relies on vision (high-volume, parallel throughput)
- External representations work around limits of internal cognition/memory

How?

what-why-how

data-task-idiom

Most ineffective designs are due to a poor match

Domain-specific → *Abstract form*

How?

Vis is multi-use:

- Exploring
- Checking pre-conceived ideas
- Long-term use in workflows/processes
- Presentation

A tool that serves well for one task can be poorly suited for another

Elements (and limitations)

- Computer (time)
- Human (memory & attention)
- Display (capacity)

Design trade-off's

- Beauty Vs Elegance
- "No picture can communicate the truth, the whole truth, and nothing but the truth" (Munzner, 2016)

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(Web) Maps

Tufte (1983)

"The most extensive data maps [...] place millions of bits of information on a single page before our eyes.

No other method for the display of statistical information is so powerful"

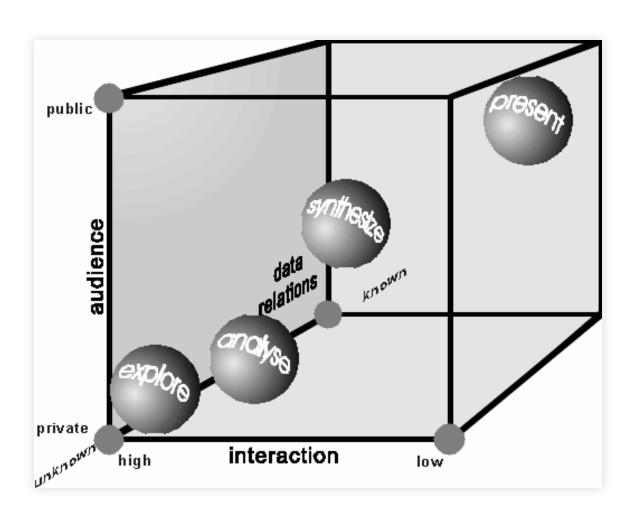
Designing good maps

Maps can fulfill several needs, looking very different depending on the end-goal

MacEachren & Kraak (1997) identify three main dimensions:

- Knowledge of what is being plotted
- Target audience
- Degree of interactivity

Map Cube



[Source]

Choropleths

Choropleths

Thematic map in which values of a variable are encoded using a color gradient of some sort

- Encode value using the color channel
- Values are classified into groups (bins)
- Information loss as a trade off for simplicity

Classification choices

- N. of bins
- How to bin?
- Colors

How many bins?

- Trade-off: detail Vs cognitive load
- Exact number depends on purpose of the map
- Usually not more than 12

How to bin?

Unique values

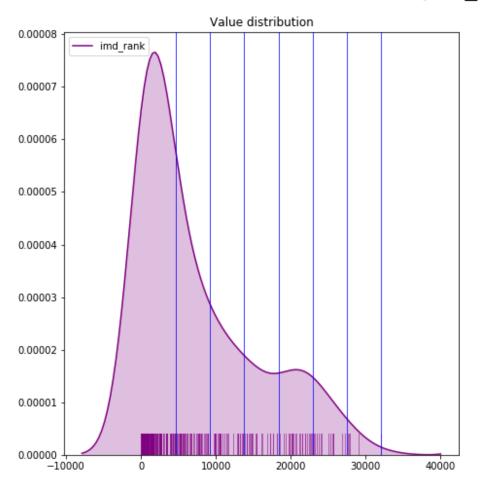
- Categorical data
- No gradient (reflect it with the color scheme!!!)
- Examples: Religion, country of origin...

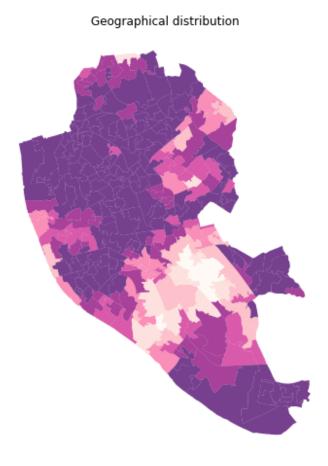
Unique values

Equal interval

- Take the **value** span of the data to represent and split it equally
- Splitting happens based on the numerical value
- Gives more weight to outliers if the distribution is skewed

$equal_interval$

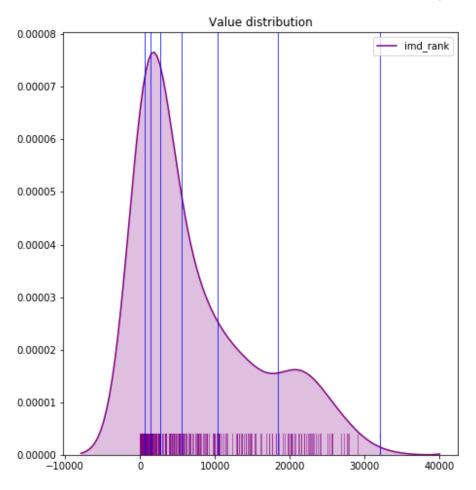


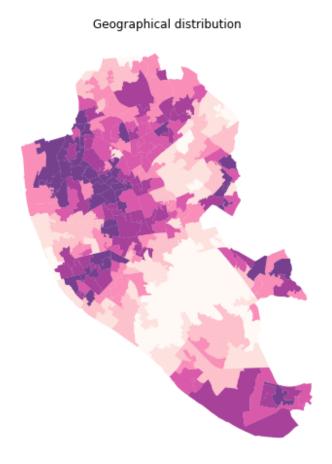


Quantiles

- Regardless of numerical values, split the distribution keeping the same amount of values in each bin
- Splitting based on the rank of the value
- If distribution is skewed, it can put very different values in the same bin

quantiles





Other

- Fisher-Jenks
- Natural breaks
- Outlier maps: box maps, std. maps...

Color schemes

Align with your purpose

- Categories, non-ordered
- Graduated, **sequential**
- Graduated, divergent



TIP: check ColorBrewer for guidance

Tips

- Think of the purpose of the map
- Explore by trying different classification alternatives
- Combine (Geo)visualisation with other statistical devices



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