



**Interactive Visualization  
Part of a GEM – Workshop**

# Interactive Visualization

## Information Analytics and Visualisation (HTI.550)

### 2024

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- Taxonomy of Interactions
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# Interaction Techniques

# Taxonomy of Interactions

## Data and View Specification

Visualize

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Sort

Derive

## View Manipulation Interaction tasks

Select

Explore

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Connect

## Process and Provenance

Record

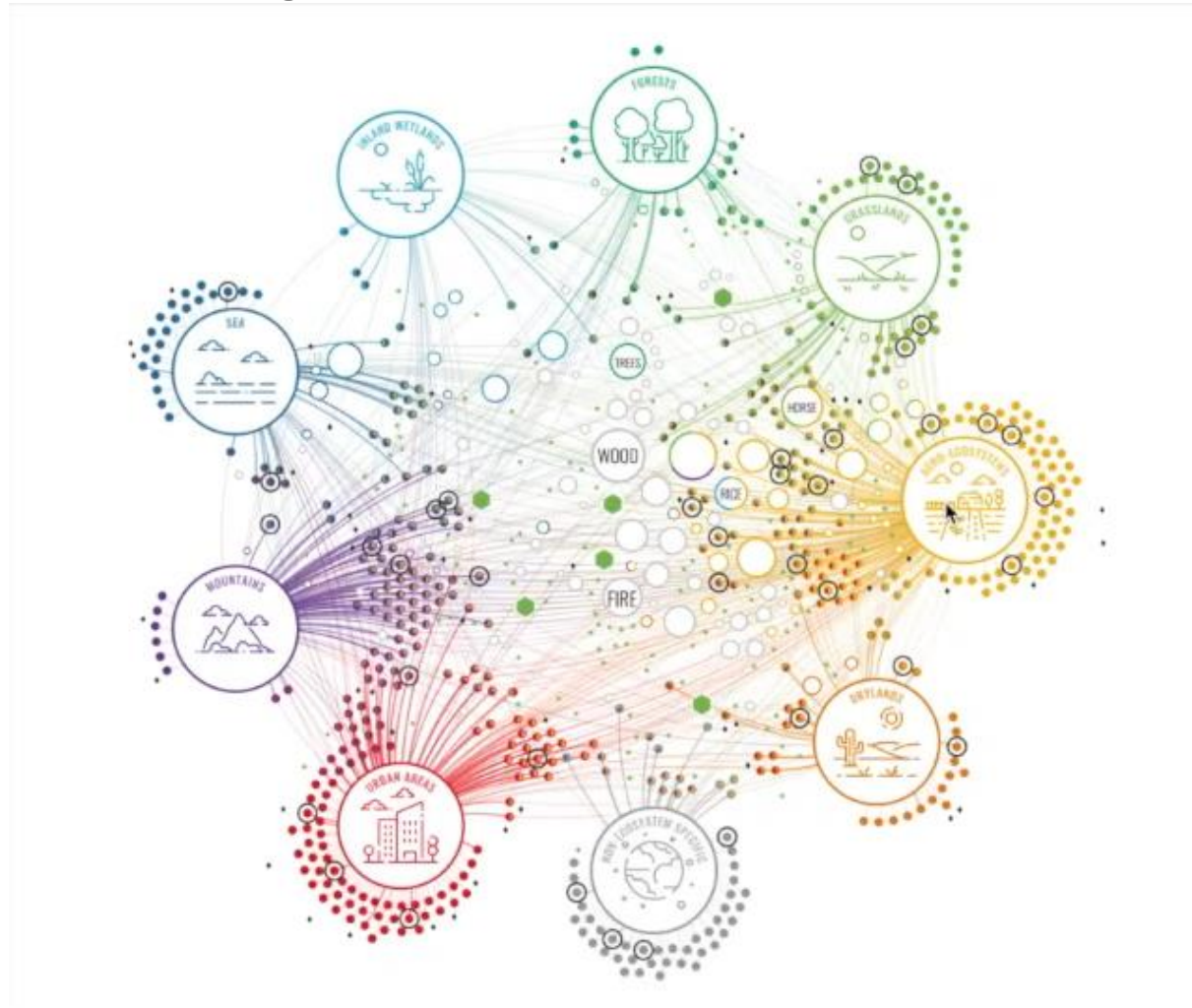
Annotate

Share

Guide

**Select: mark something as interesting**

# Select 1/3 – Hover and Clicking



Vibrant intangible cultural heritage practices and expressions. Bioms and Natural Resources

<https://ich.unesco.org/en/dive&display=biome#tabs>

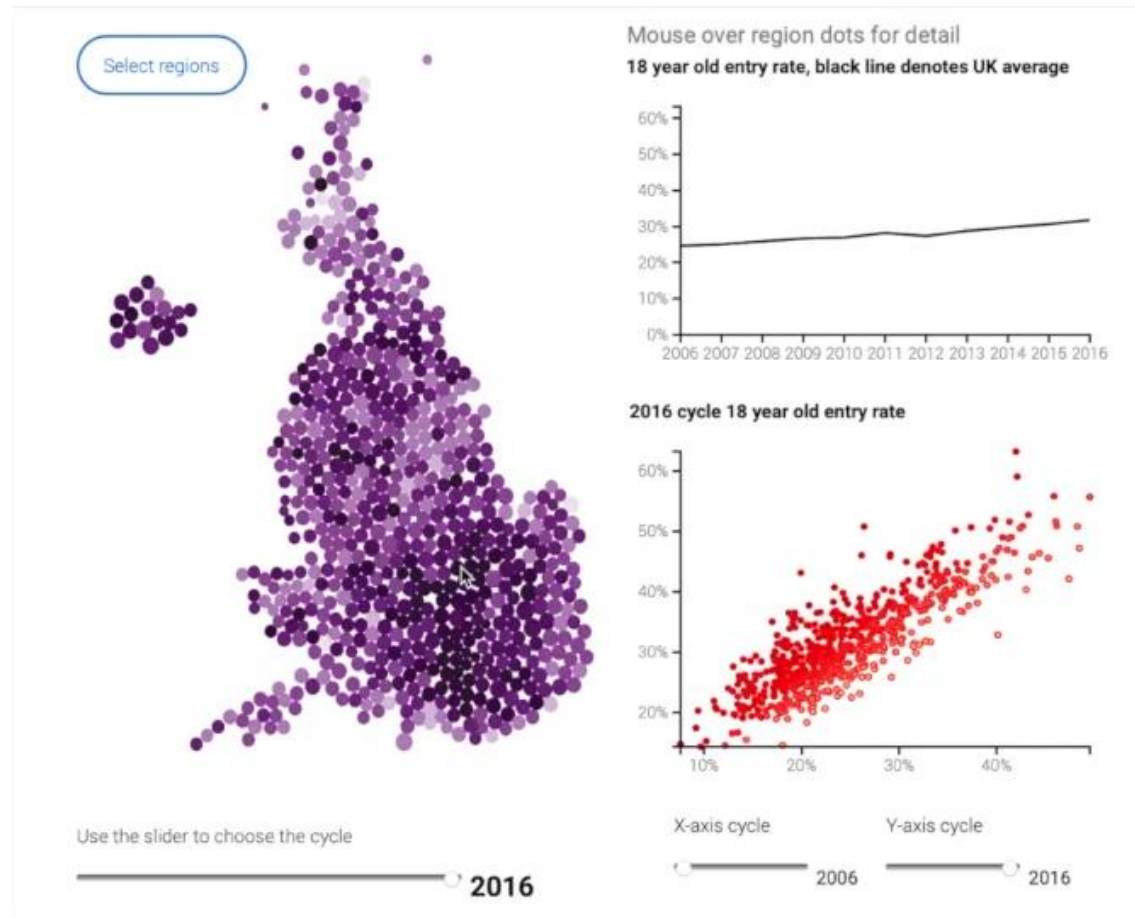
# Select 2/3 – Query



The 10 most popular baby names per year since 1880, USA. <http://nbremer.github.io/babynames/>



# Select 3/3 – Linking and Brushing



2016 UCAS End of Cycle Report

<https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/he-entry-rates>

**Explore: show me something else**

# Explore 1/4 – Panning & Zooming



Vibrant intangible cultural heritage practices and expressions. Constellation

<https://ich.unesco.org/en/dive&display=constellation#tabs>

# Explore 2/4 – Scrolling

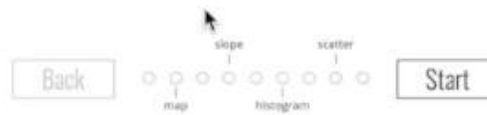


A 1000 years of ancestral connections in the European royal families

<http://www.datasketch.es/october/code/nadieh/>

# Explore 3/4 – Direct-Walk (direct manipulation)

Urbanization in East Asia between 2000 and 2010



Visuals | Nadieh Bremer | VisualCinnamon.com  
Text | Nadieh Bremer & Marieke Ranzijn  
Inspiration | World Bank report  
Data | World Bank open & PUMA datasets

Urbanization in East Asia between 2000 and 2010

<http://nbremer.github.io/urbanization/>

# Explore 4/4 – Direct-Walk (animation)

## Urbanization in East Asia between 2000 and 2010



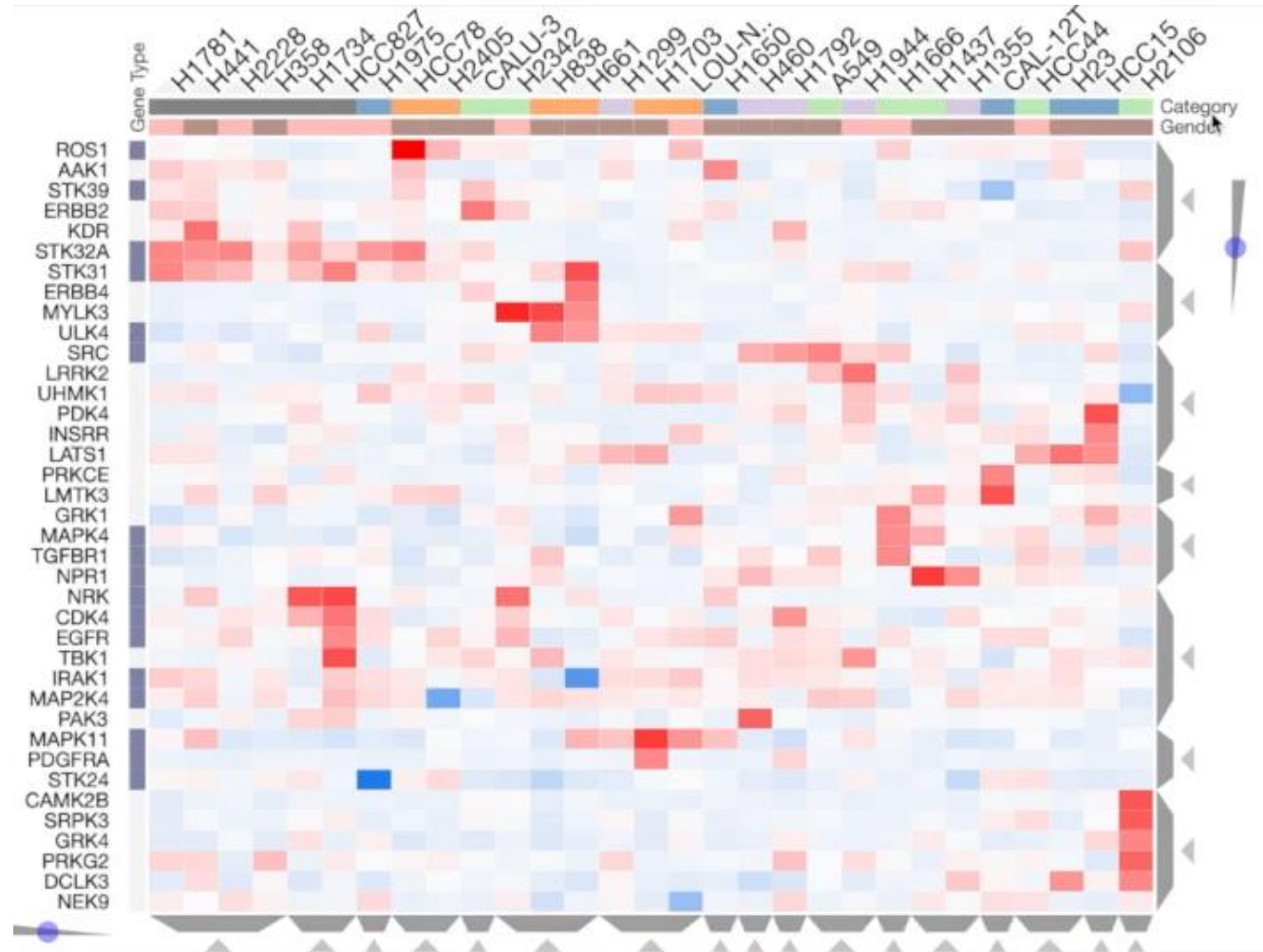
Visuals | Nadieh Bremer | VisualCinnamon.com  
Text | Nadieh Bremer & Marleke Ranzijn  
Inspiration | World Bank report  
Data | World Bank open & PUMA datasets

Urbanization in East Asia between 2000 and 2010

<http://nbremer.github.io/urbanization/>

**Reconfigure: show me a different  
arrangement**

# Reconfigure 1/3 – Sorting

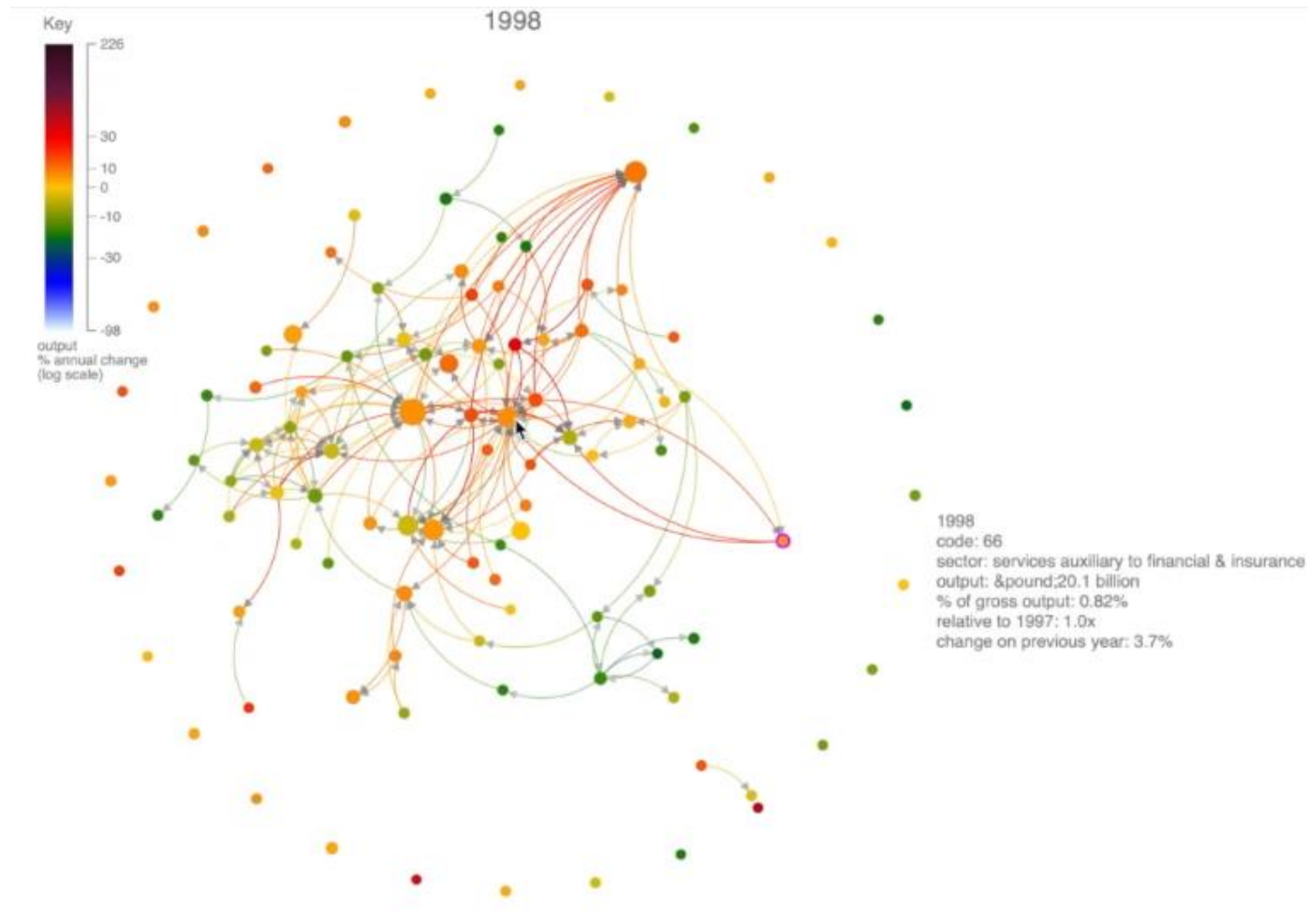


Example of a clustergram

[http://amp.pharm.mssm.edu/clustergrammer/viz\\_sim\\_mats/58a492b4a63cb826f0be6476/rc\\_two\\_cats.txt](http://amp.pharm.mssm.edu/clustergrammer/viz_sim_mats/58a492b4a63cb826f0be6476/rc_two_cats.txt)



# Reconfigure 2/3 – Move Data (re-arrangement)

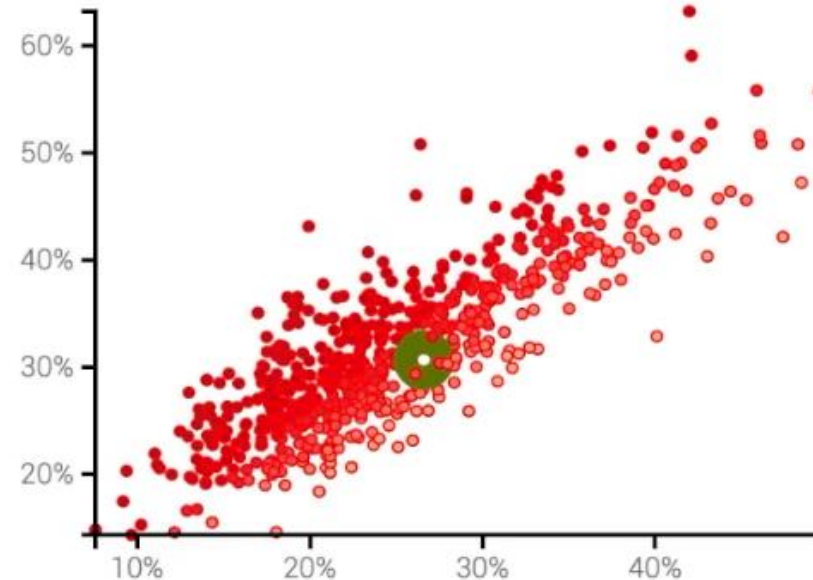


UK economy as a network using input-output data, 1998-2012

[http://helenjacksonanalytic.co.uk/UK\\_Economy\\_Network.html](http://helenjacksonanalytic.co.uk/UK_Economy_Network.html)

# Reconfigure 3/3 – Manipulate axes

2016 cycle 18 year old entry rate



X-axis cycle

Y-axis cycle



2006



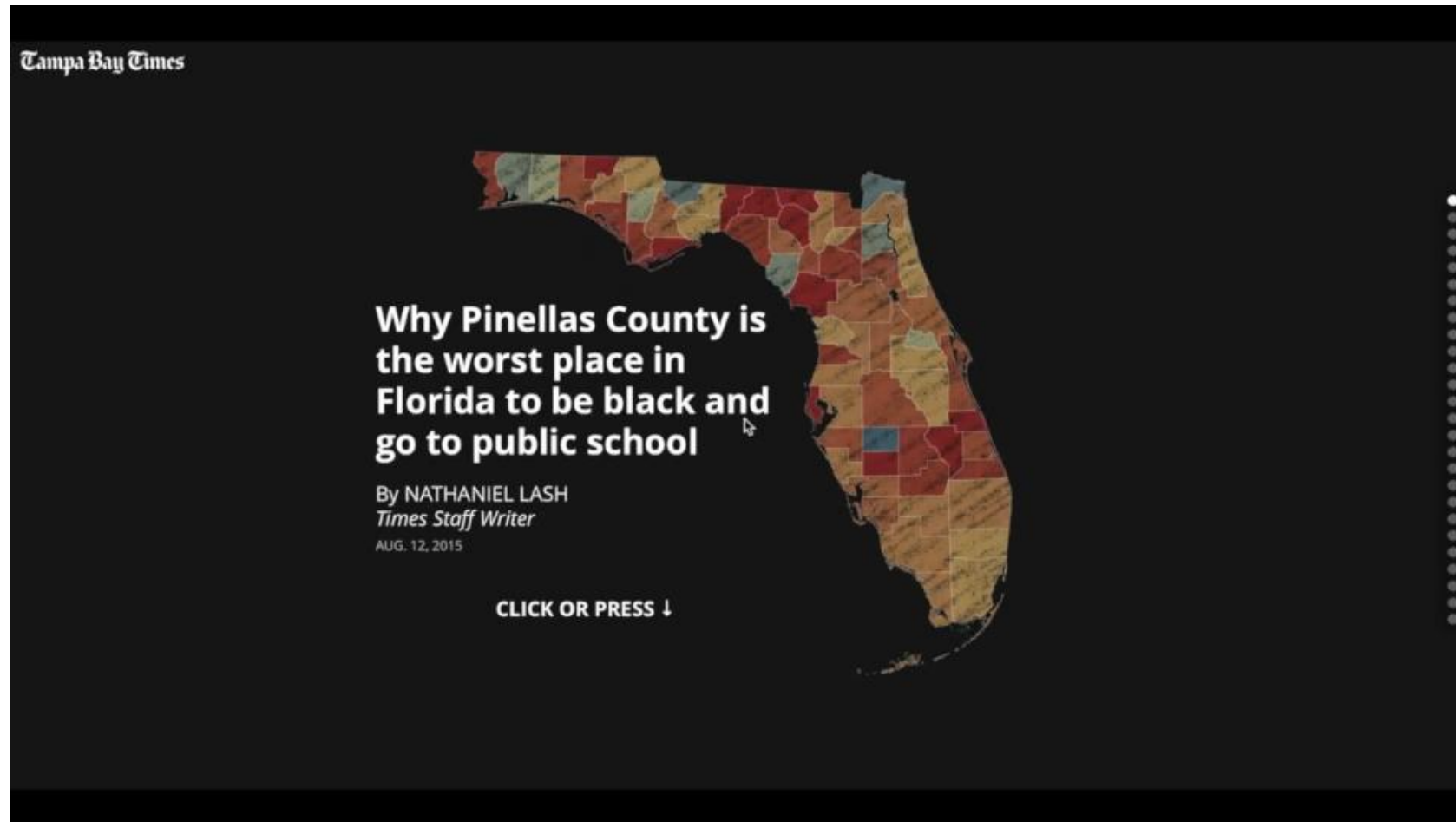
2016

2016 UCAS End of Cycle Report

<https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/he-entry-rates>

**Encode: show me a different  
representation**

# Encode – Visual encoding; alter data representation

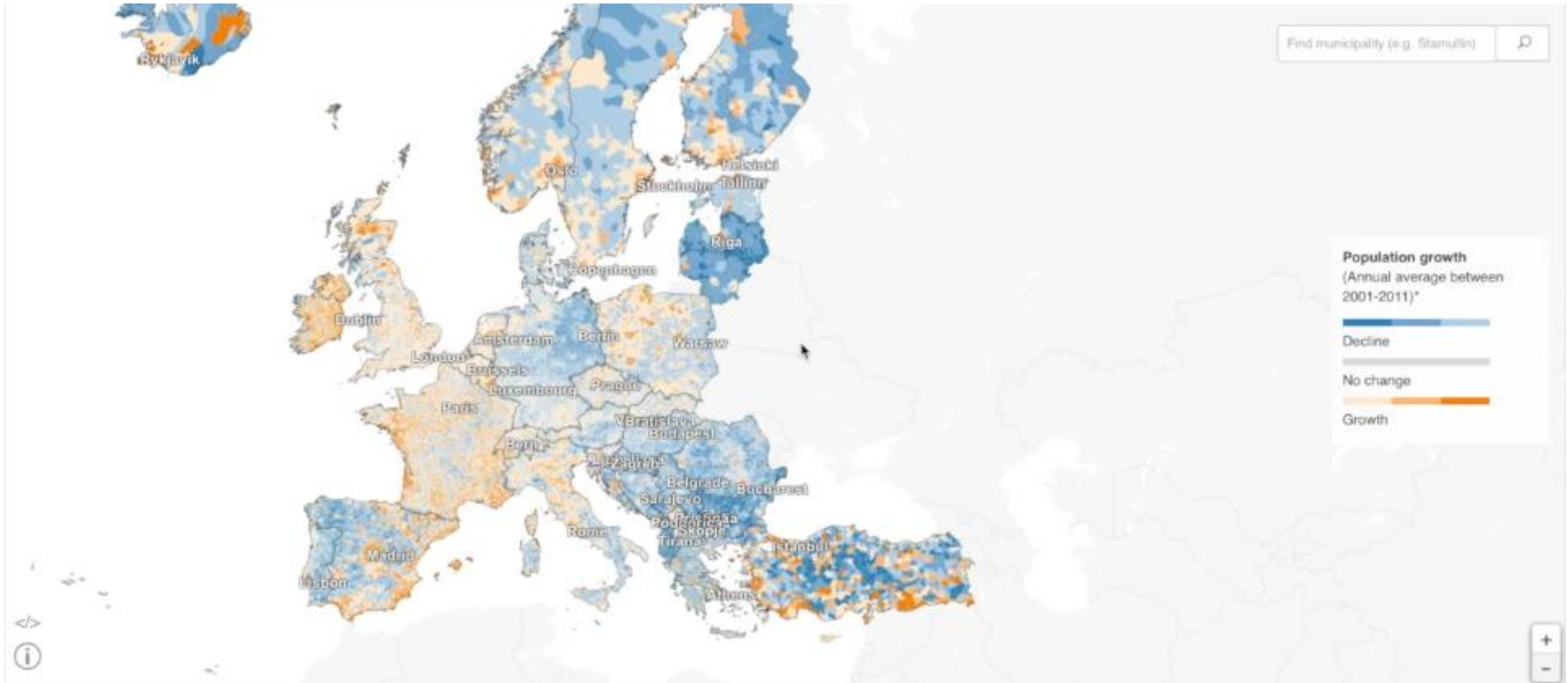


Pinellas County's Public School Inequalities

<http://www.tampabay.com/projects/2015/investigations/pinellas-failure-factories/chart-failing-black-students/>

**Abstract/Elaborate:  
show me more or less detail**

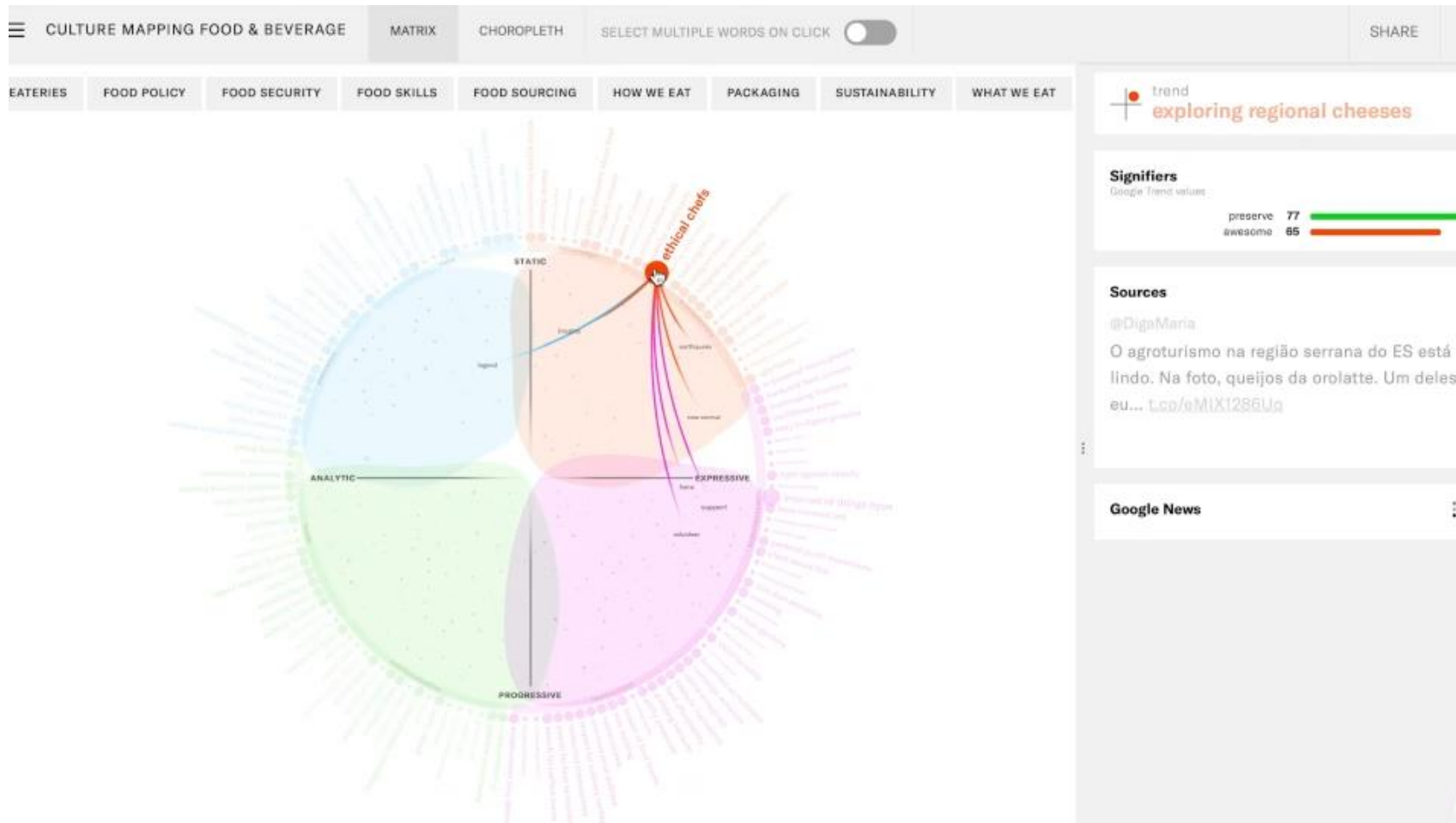
# Abstract/Elaborate 1/3 – Zooming



Where the Population of Europe is Growing And Declining

<https://interaktiv.morgenpost.de/europakarte/#8/52.914/-7.943/en>

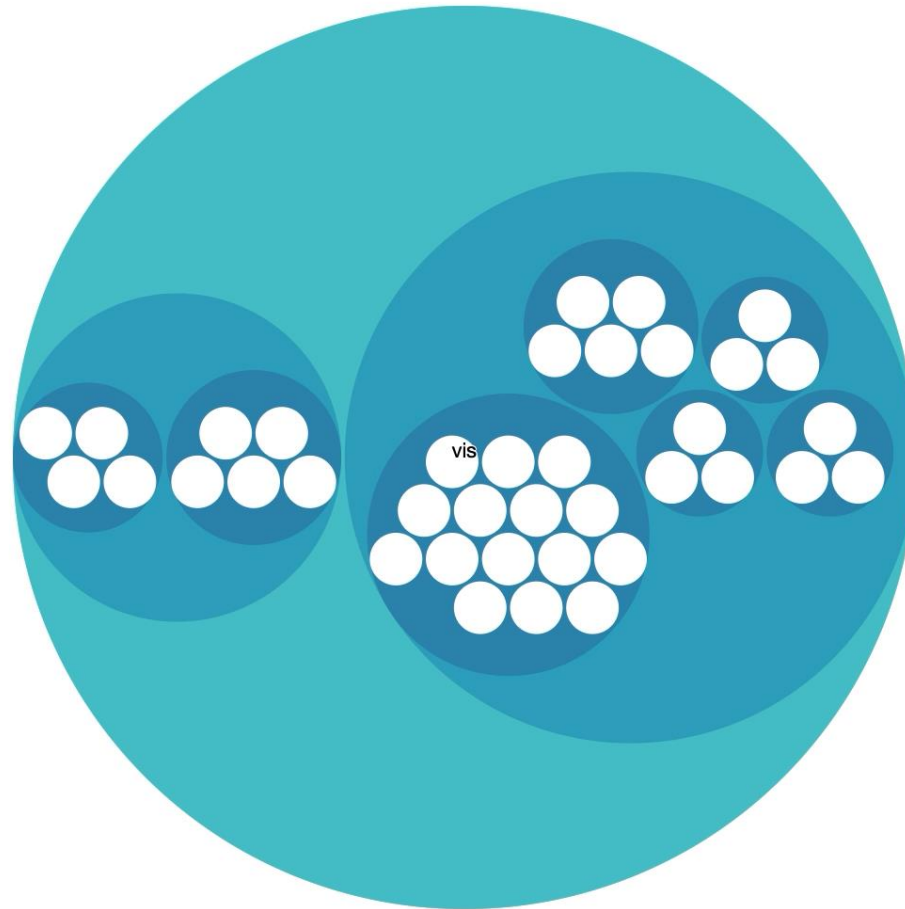
# Abstract/Elaborate 2/3 – Hover



Culture mapping

<https://foodandbeveragetrends2018.scenariodna.com/app/circle/word/backyard-farm-animals>

# Abstract/Elaborate 3/3 – Drill-Down



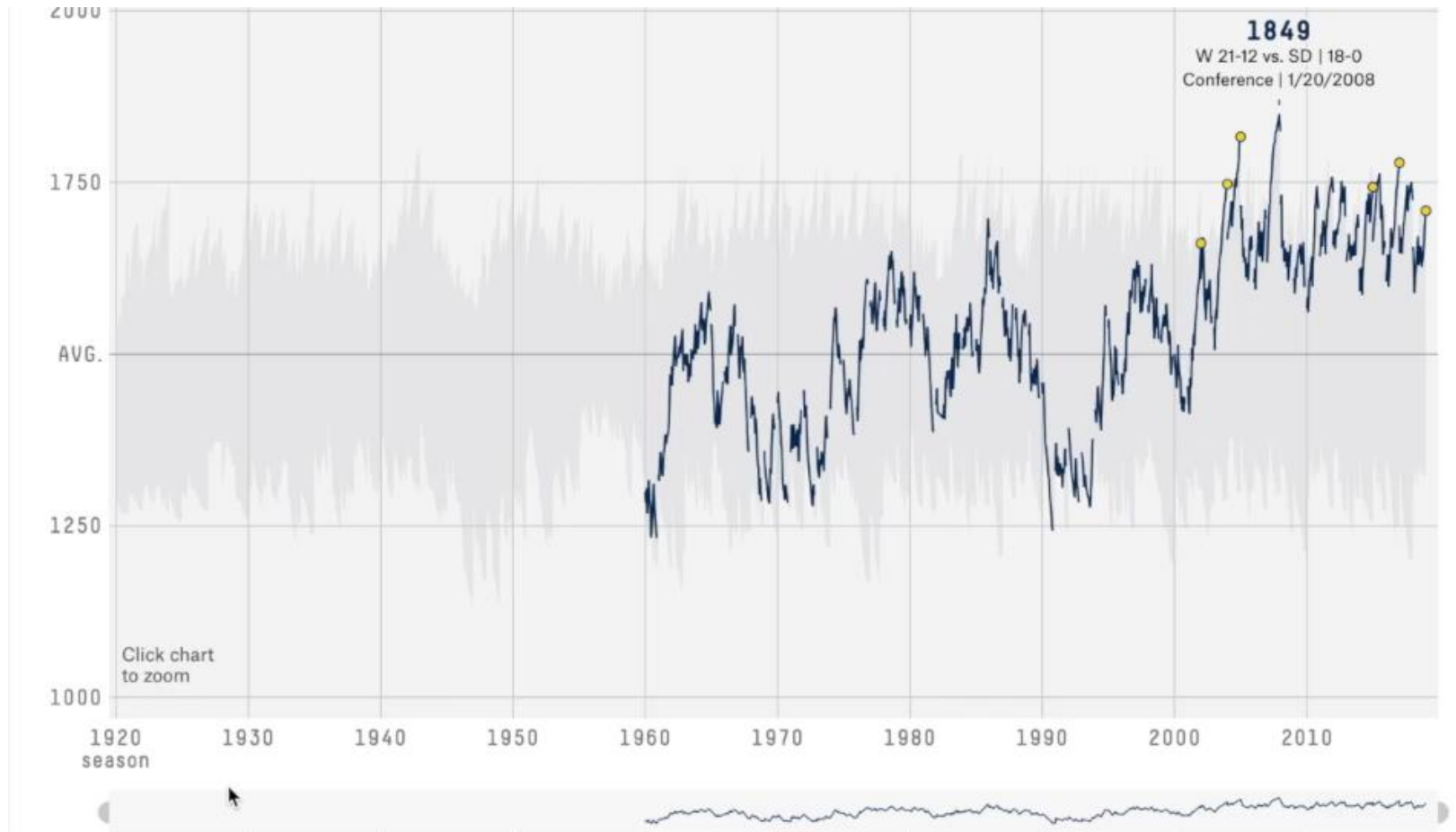
Example of zoomable circle-packing

<https://www.r-graph-gallery.com/338-interactive-circle-packing-with-circlepacker>



**Filter: show me something  
conditionally**

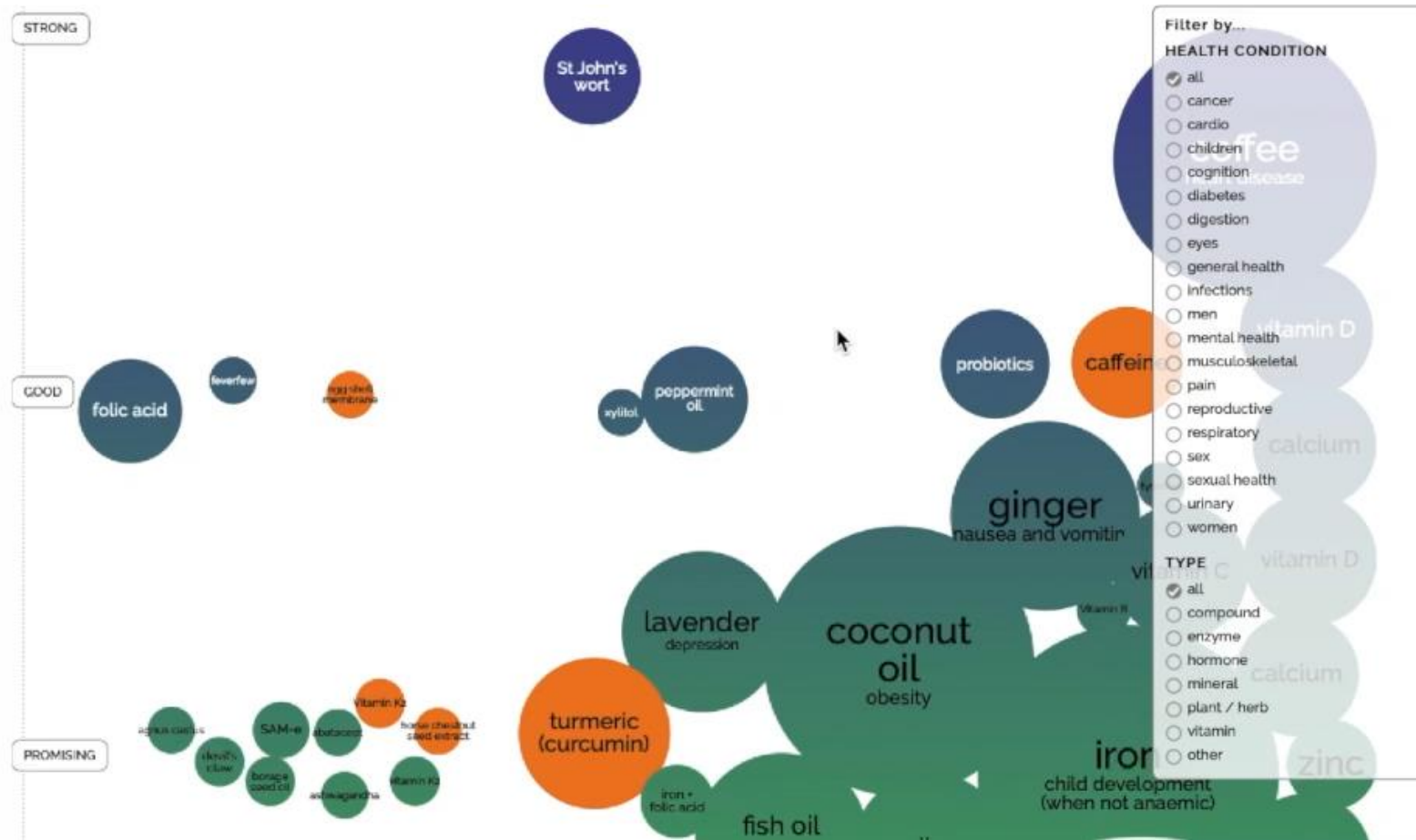
# Filter 1/2 – Dynamic Queries (select range)



The Complete History Of The NFL

<https://projects.fivethirtyeight.com/complete-history-of-the-nfl/>

# Filter 2/2 – Dynamic Queries (check boxes)

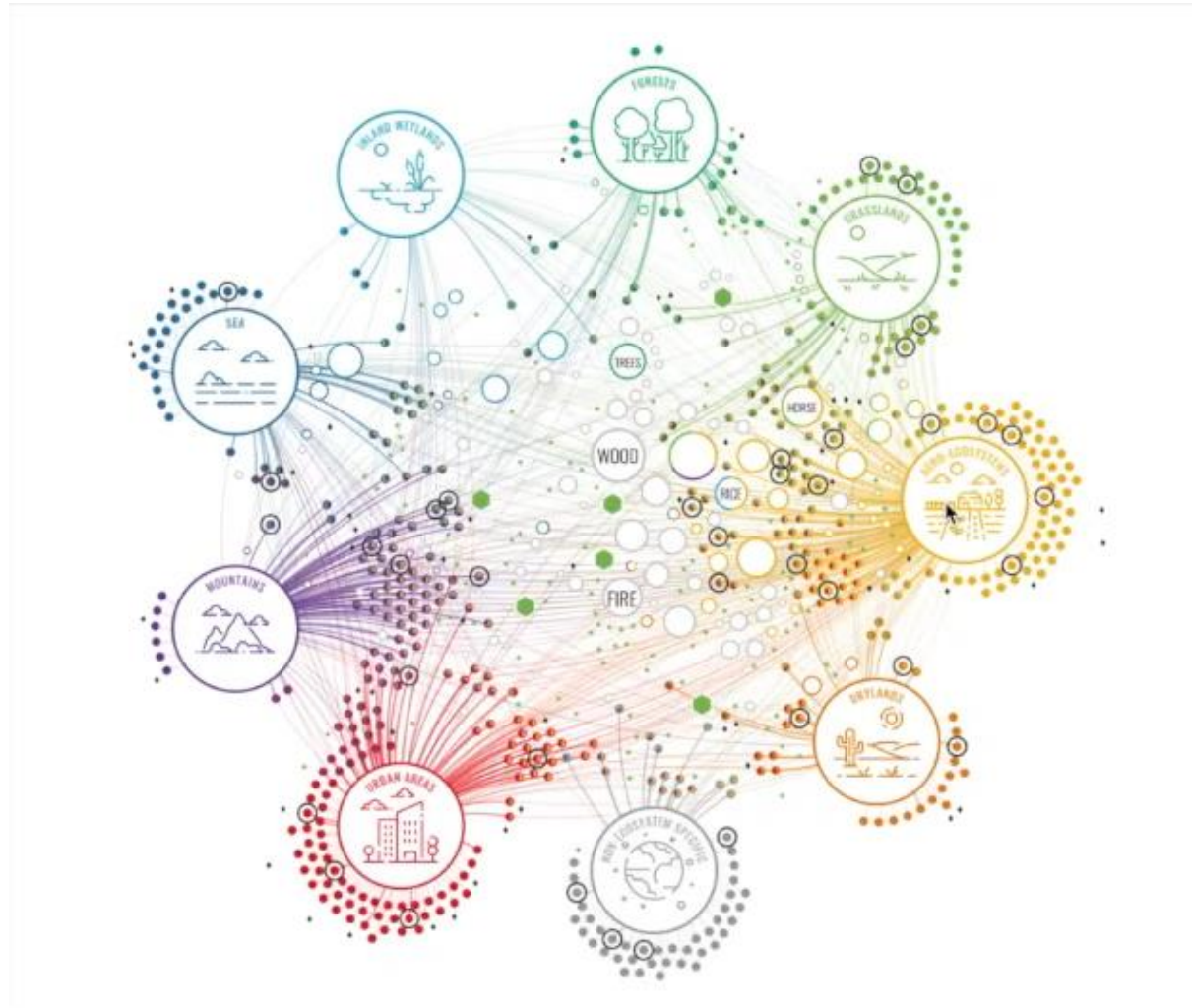


Scientific evidence for popular health supplements

<http://informationisbeautiful.net/visualizations/snake-oil-scientific-evidence-for-nutritional-supplements-vizsweet/>

**Connect: show me related items**

# Connect



Vibrant intangible cultural heritage practices and expressions. Bioms and Natural Resources

<https://ich.unesco.org/en/dive&display=biome#tabs>

# Alternative Interactions

Dimension	Sub-dimension	Example
Technology	Input Type	Pen, touch, speech, (body) gesture, gaze
	Input Resolution	High (e.g., mouse) ~ low (freeform in-air gesture)
	Output type	Mobile devices, surfaces and tabletops, wall-size Displays, speakers (or headsets), haptic devices
Human-Computer Interaction	Embodiment	Finger proxies, sticky tools, touch projector
	Instruments	Pen, glove, sensor

# The GEM Consortium



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