Interactive Visualization

Data Visualization: Intermediary Techniques

Bachelor of Arts in Interaction Design
Zürich University of the Arts
November 21, 2017

Benjamin Wiederkehr
benjamin@interactivethings.com

Module 3

Intermediary Techniques

3.1

Composition

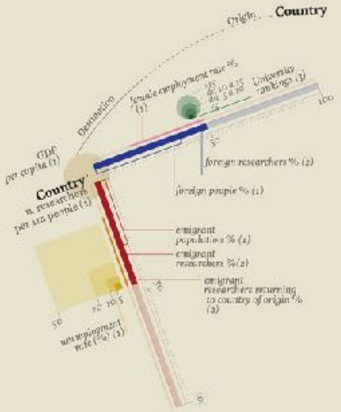
What elements do visualizations consist of.

Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2011 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it), and was originally published in italian on La Lettura the sunday cultural supplement of Corriere della Sera.

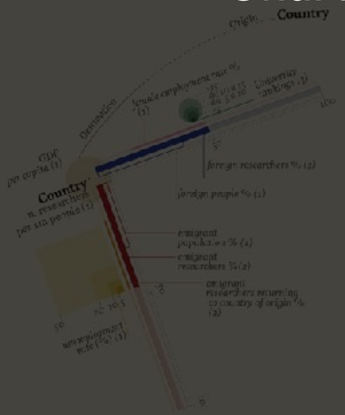
Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

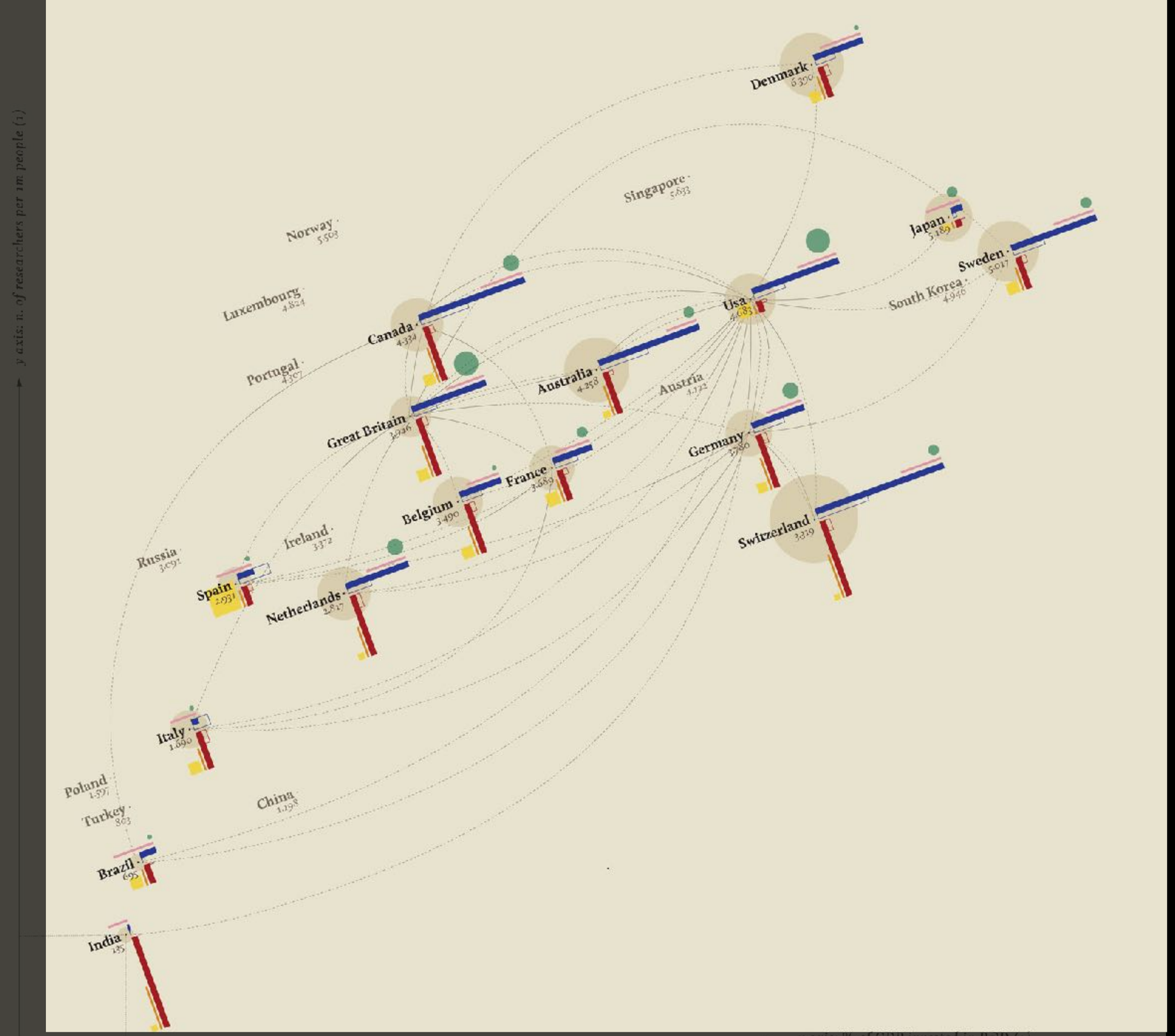
The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data

Chart



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on La Lettura the sunday cultural supplement of Corriere della Sera.

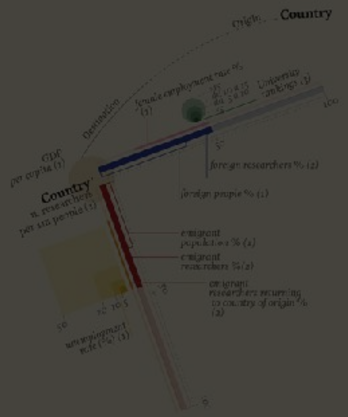


Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

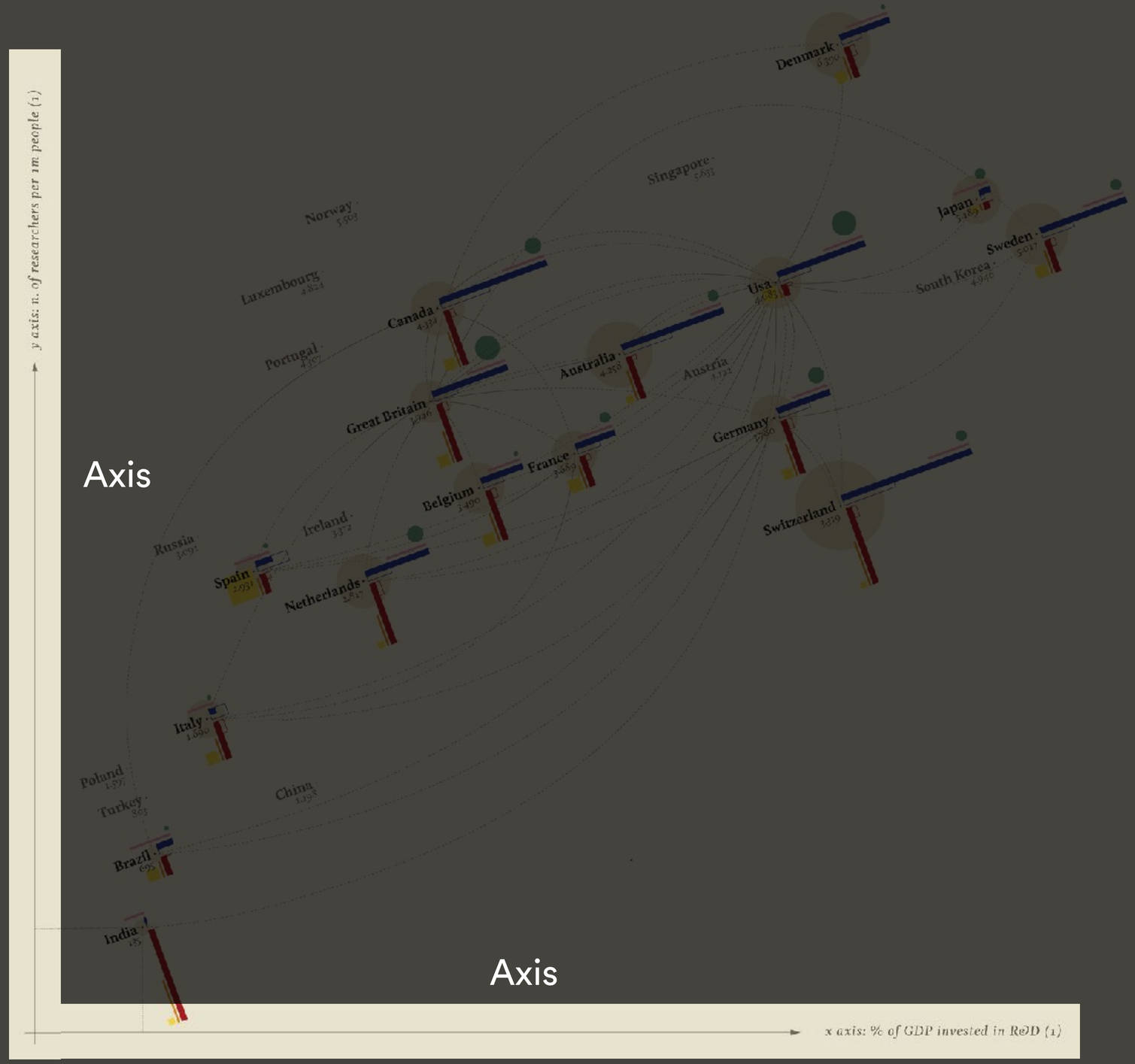
How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on Lu Lettura the sunday cultural supplement of Corriere della Sera.



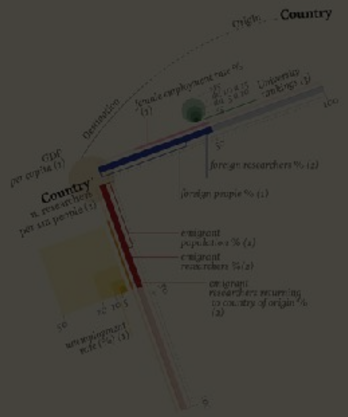
Brain drain

Title

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

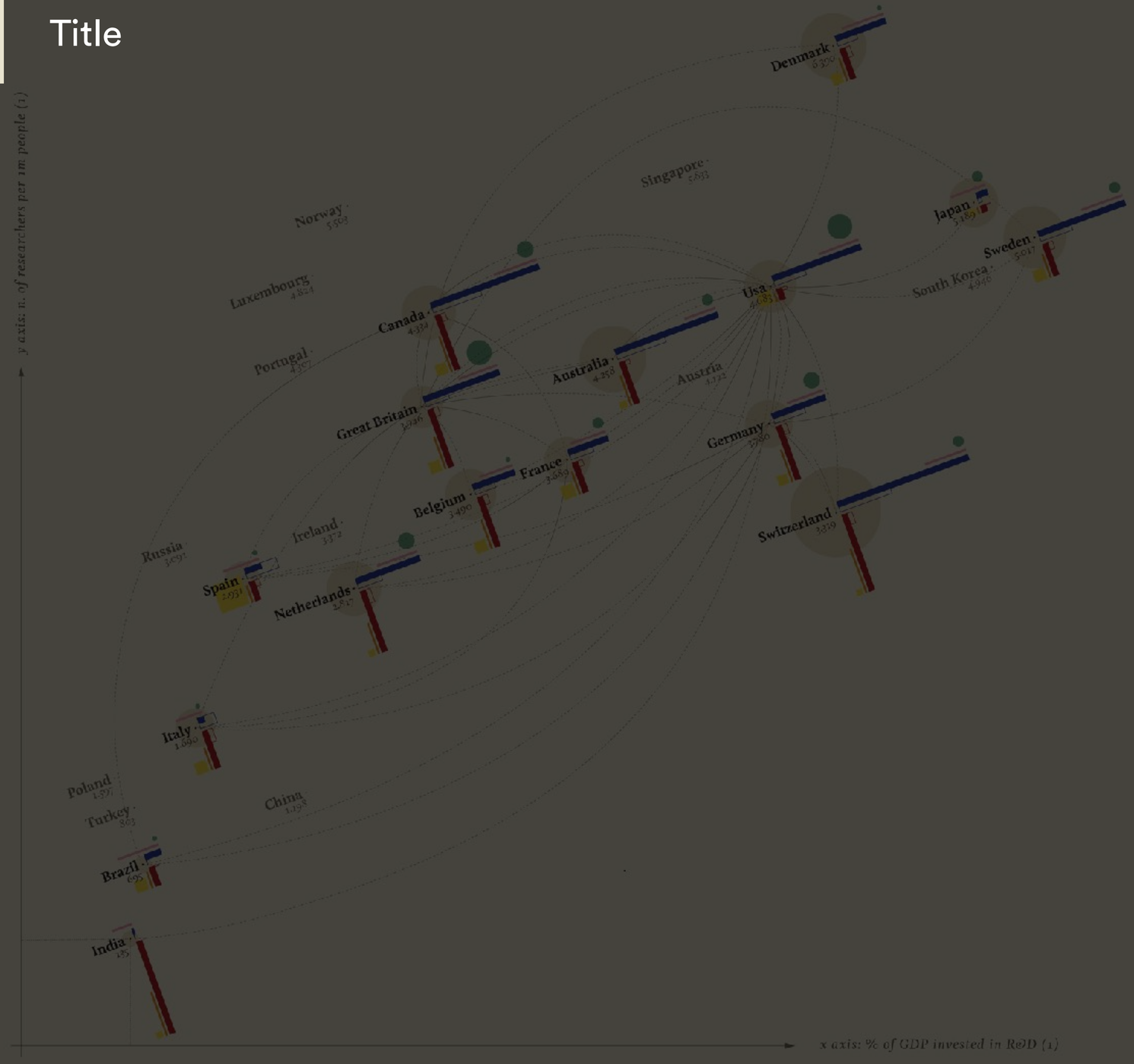
How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on Lu Lettura the sunday cultural supplement of Corriere della Sera.

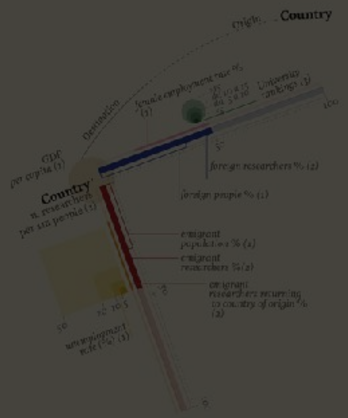


Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on La Lettura the sunday cultural supplement of Corriere della Sera.

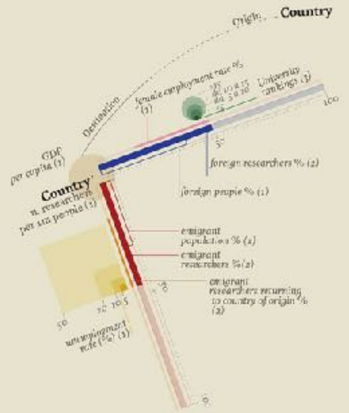
Introduction

Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

The countries are positioned according to:
% of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2011 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on Lu Lettura the sunday cultural supplement of Corriere della Sera.

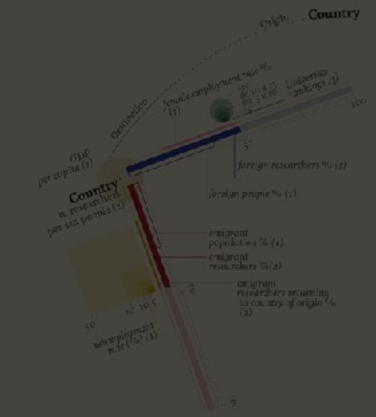
Legend

Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it) and was originally published in italian on Lu Lettura the sunday cultural supplement of Corriere della Sera.

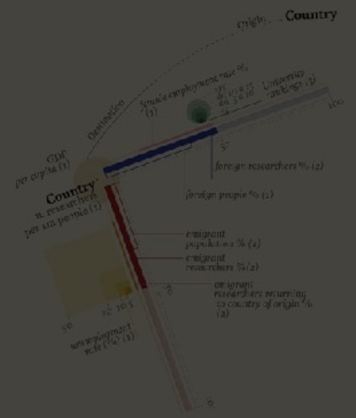
Sources

Brain drain

The phenomena of so-called «brain drain» is explored through a map showing incoming and outgoing flows of researchers in 16 countries. Using a series of parametres, the map is an attempt to discover the motivations that move researchers from one country to another. Each country is visualized through the representation of: GDP per capita, female employment rate, overall unemployment rate, university rankings, percentage of foreign researchers, percentage of overall foreign population, percentage of emigrant researchers, percentage of overall emigrant population, percentage of researchers returning to their country of origin, and the main countries researchers come from and move to.

How to read it?

The countries are positioned according to:
- % of GDP invested in R&D (x axis)
+ n. of researchers per 1m people (y axis)
The analysis is based on the following data



(1) World Bank (2005-2010, worldbank.org)
(2) Foreign Born Scientists: Mobility Patterns for Sixteen Countries (2012 paper by Chiara Franzoni, Giuseppe Scellato and Paula Stephan, nber.org)
(3) Times Higher Education World University Rankings (2011-2012 timeshighereducation.co.uk)

The visualization has been designed and produced by Accurat (www.accurat.it), and was originally published in italian on La Lettura the sunday cultural supplement of Corriere della Sera.

y axis: n. of researchers per 1m people (1)

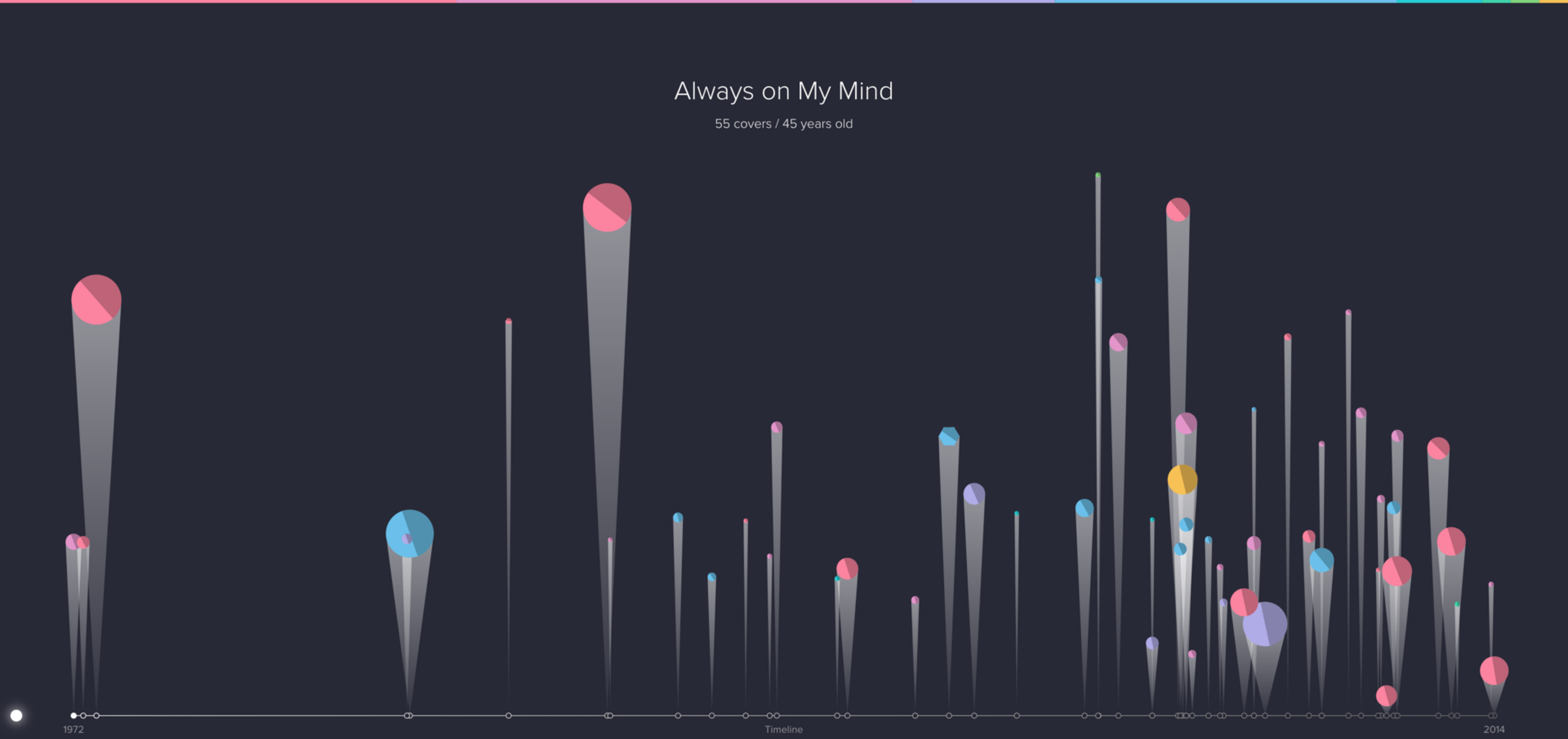
x axis: % of GDP invested in R&D (1)

Denmark 5.300
Singapore 5.633
Norway 5.569
Japan 3.189
Sweden 5.017
Luxembourg 4.824
South Korea 4.976
Usa 4.683
Canada 4.331
Portugal 4.367
Australia 4.258
Austria 4.172
Great Britain 3.936
Germany 3.786
France 3.483
Belgium 3.490
Ireland 3.372
Switzerland 3.379
Russia 3.691
Spain 2.931
Netherlands 3.817
Italy 1.980
Poland 1.397
Turkey 863
China 1.358
Brazil 695
India 485

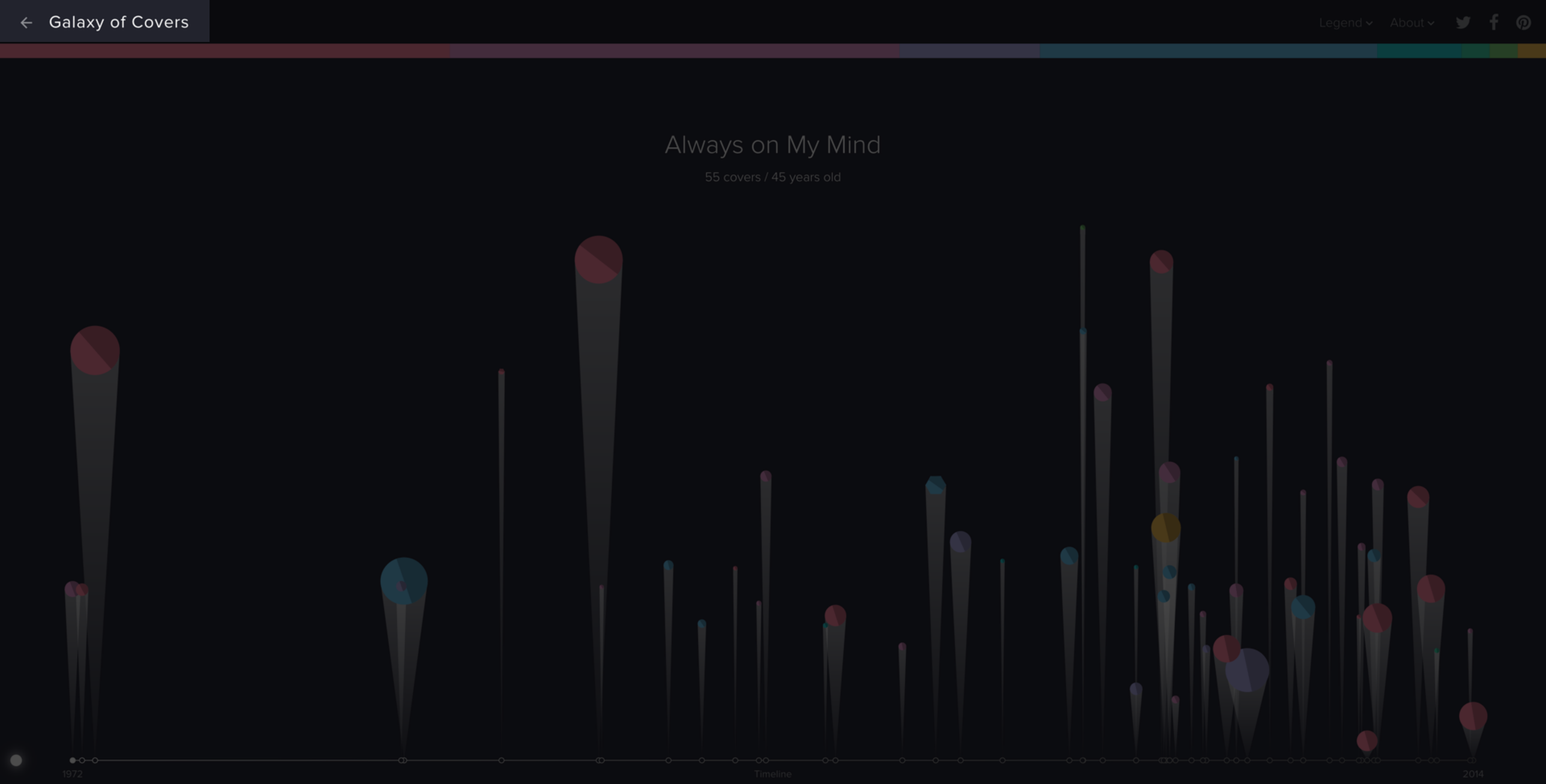
Credits

Common components in a composition

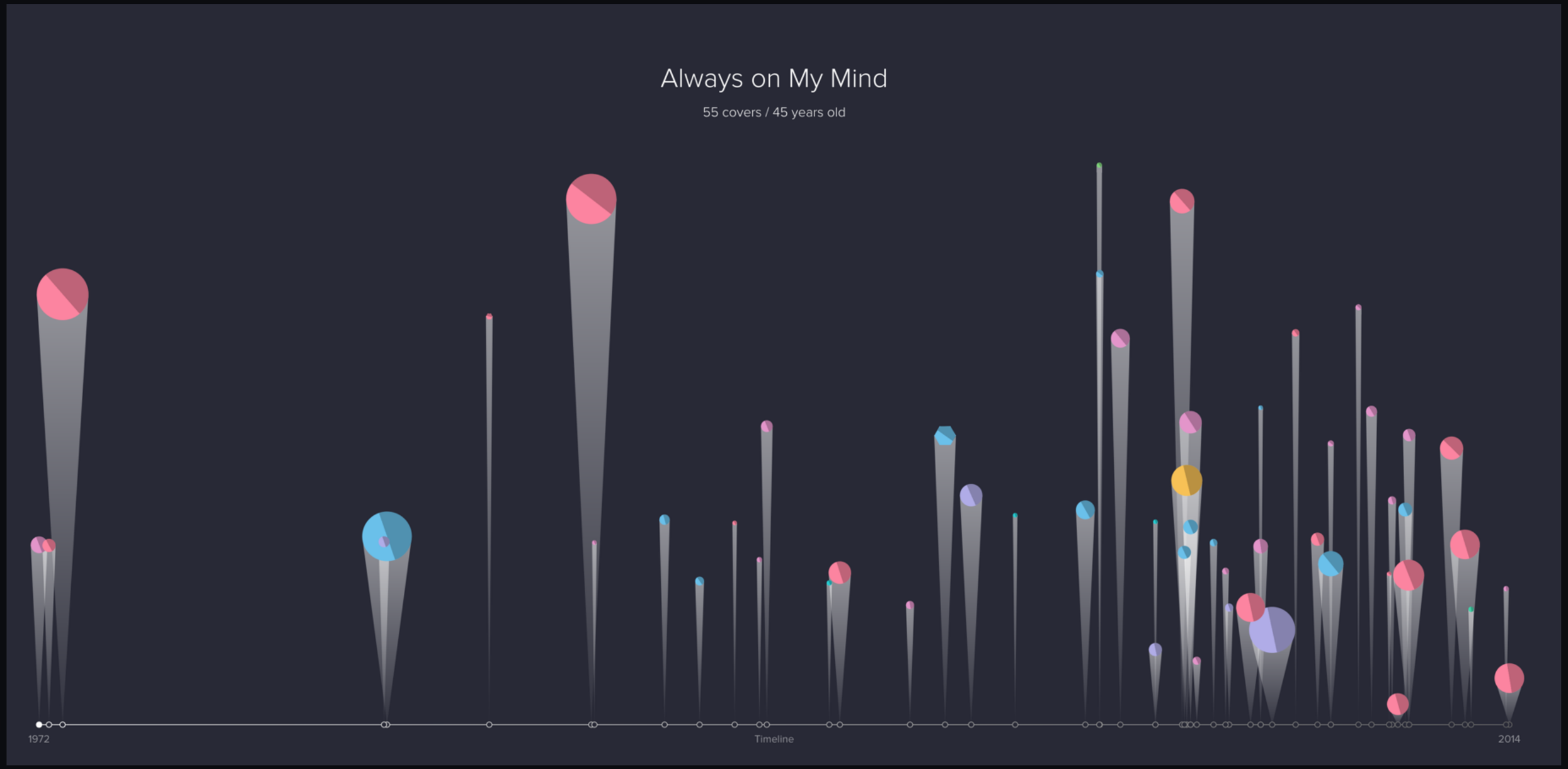
- Title
- Introduction
- Chart, diagram, graph
- Axis
- Legend
- Sources
- Methodology
- Credits



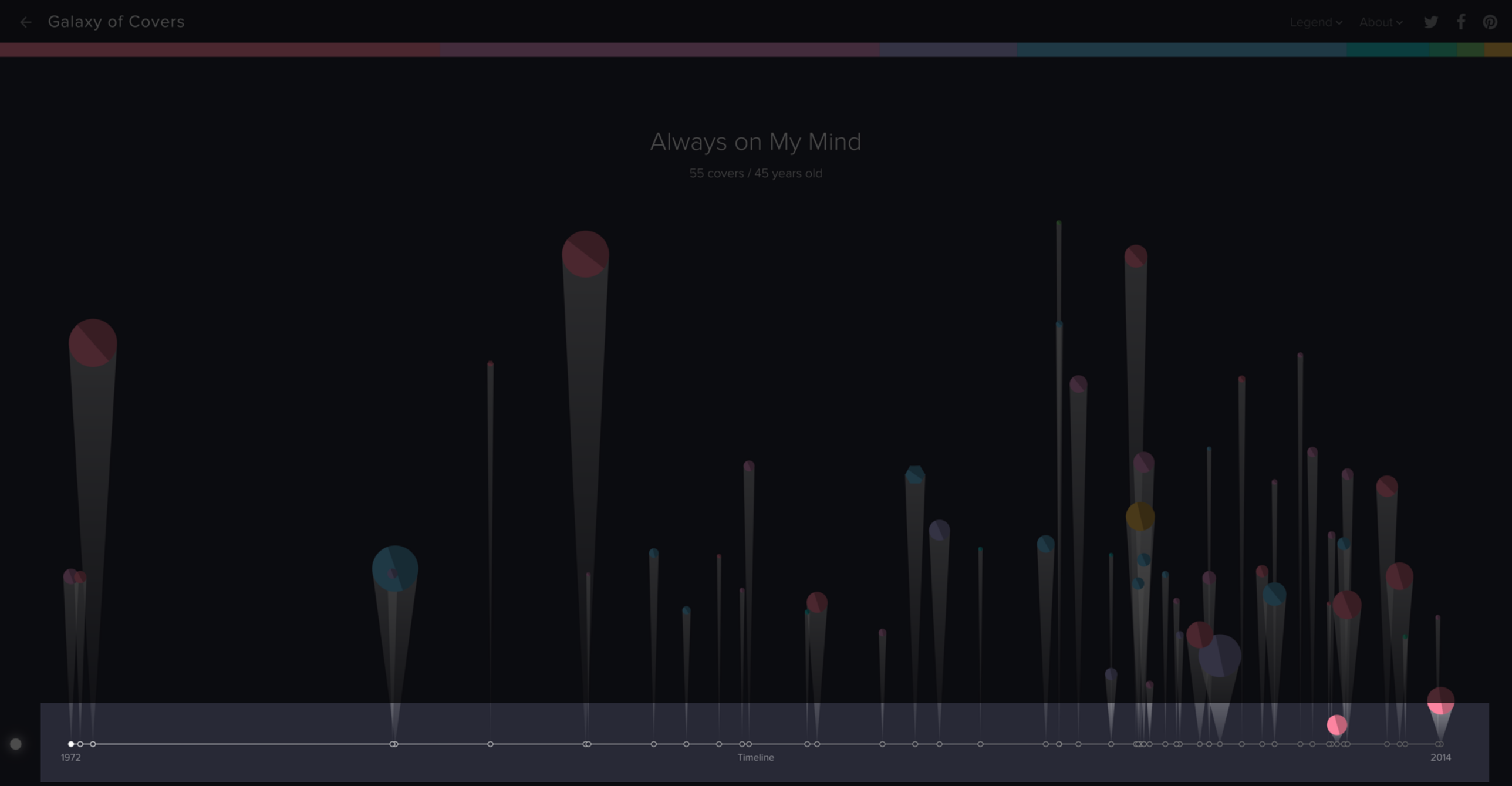
https://lab.interactivethings.com/galaxy-of-covers/



https://lab.interactivethings.com/galaxy-of-covers/



https://lab.interactivethings.com/galaxy-of-covers/



https://lab.interactivethings.com/galaxy-of-covers/

https://lab.interactivethings.com/galaxy-of-covers/

https://lab.interactivethings.com/galaxy-of-covers/

Galaxy of Covers

Honoring the evolution of the 50 most popular cover songs of all time.

About the Project

Our most beloved songs have a longer history than we might think. They might exist in hundreds of alternative versions created by other artists in distant decades. Those versions can differ in character and style and reach completely different audiences.

We looked closely at the 50 most popular cover songs as well as the original works. Galaxy of Covers is the result of this analysis and allows you to explore the evolution from idea to recording.

About the Visualization

The panorama view shows the 50 top songs as individual planetary systems with the original work as the sun. Each planet represents a version of the song and it's appearance indicates characteristics including genre, popularity, tempo, valence, energy, and speechiness. The radius of its orbit around the sun shows the years between the publication dates. This view allows you to compare the structure and density of the constellation of different songs from a high-level perspective.

The detail view lists the versions of one song in cross section. The characteristics and positioning of the planets is consistent with the panorama. This view allows you to compare different versions of the same song individually.

Sources

The dataset that drives this application is retrieved from the following sources:

- BBC: List of 50 most popular cover songs.
- Echonest: Information on tempo, valence, energy, and speechiness.
- Spotify: Information on popularity.
- Secondhand Songs: Information on cover version, artist, and date.
- Whosampled: Information on music genre.

Technology

The visualization is hand crafted with standard web technologies HTML, CSS, JavaScript using open source software including D3, React, Webpack among others. Please refer to our Github repository for more details.

Credits

Galaxy of Covers has been created by Interactive Things, a digital product design studio based in Zürich, Switzerland. Research, concept, design, and development was done by Tania Boa, Ilya Boyandin, Mark Hintz, Jan Wächter, and Benjamin Wiederkehr.

https://lab.interactivethings.com/galaxy-of-covers/

Galaxy of Covers

Honoring the evolution of the 50 most popular cover songs of all time.

About the Project

Our most beloved songs have a longer history than we might think. They might exist in hundreds of alternative versions created by other artists in distant decades. Those versions can differ in character and style and reach completely different audiences.

We looked closely at the 50 most popular cover songs as well as the original works. Galaxy of Covers is the result of this analysis and allows you to explore the evolution from idea to recording.

About the Visualization

The panorama view shows the 50 top songs as individual planetary systems with the original work as the sun. Each planet represents a version of the song and it's appearance indicates characteristics including genre, popularity, tempo, valence, energy, and speechiness. The radius of its orbit around the sun shows the years between the publication dates. This view allows you to compare the structure and density of the constellation of different songs from a high-level perspective.

The detail view lists the versions of one song in cross section. The characteristics and positioning of the planets is consistent with the panorama. This view allows you to compare different versions of the same song individually.

Sources

The dataset that drives this application is retrieved from the following sources:

- BBC: List of 50 most popular cover songs.
- Echonest: Information on tempo, valence, energy, and speechiness.
- Spotify: Information on popularity.
- Secondhand Songs: Information on cover version, artist, and date.
- Whosampled: Information on music genre.

Technology

The visualization is hand crafted with standard web technologies HTML, CSS, JavaScript using open source software including D3, React, Webpack among others. Please refer to our Github repository for more details.

Credits

Galaxy of Covers has been created by Interactive Things, a digital product design studio based in Zürich, Switzerland. Research, concept, design, and development was done by Tania Boa, Ilya Boyandin, Mark Hintz, Jan Wächter, and Benjamin Wiederkehr.

https://lab.interactivethings.com/galaxy-of-covers/

Galaxy of Covers

Honoring the evolution of the 50 most popular cover songs of all time.

About the Project

Our most beloved songs have a longer history than we might think. They might exist in hundreds of alternative versions created by other artists in distant decades. Those versions can differ in character and style and reach completely different audiences.

We looked closely at the 50 most popular cover songs as well as the original works. Galaxy of Covers is the result of this analysis and allows you to explore the evolution from idea to recording.

About the Visualization

The panorama view shows the 50 top songs as individual planetary systems with the original work as the sun. Each planet represents a version of the song and it's appearance indicates characteristics including genre, popularity, tempo, valence, energy, and speechiness. The radius of its orbit around the sun shows the years between the publication dates. This view allows you to compare the structure and density of the constellation of different songs from a high-level perspective.

The detail view lists the versions of one song in cross section. The characteristics and positioning of the planets is consistent with the panorama. This view allows you to compare different versions of the same song individually.

Sources

The dataset that drives this application is retrieved from the following sources:

- BBC: List of 50 most popular cover songs.
- Echonest: Information on tempo, valence, energy, and speechiness.
- Spotify: Information on popularity.
- Secondhand Songs: Information on cover version, artist, and date.
- Whosampled: Information on music genre.

Technology

The visualization is hand crafted with standard web technologies HTML, CSS, JavaScript using open source software including D3, React, Webpack among others. Please refer to our Github repository for more details.

Credits

Galaxy of Covers has been created by Interactive Things, a digital product design studio based in Zürich, Switzerland. Research, concept, design, and development was done by Tania Boa, Ilya Boyandin, Mark Hintz, Jan Wächter, and Benjamin Wiederkehr.

https://lab.interactivethings.com/galaxy-of-covers/

Galaxy of Covers

Honoring the evolution of the 50 most popular cover songs of all time.

About the Project

Our most beloved songs have a longer history than we might think. They might exist in hundreds of alternative versions created by other artists in distant decades. Those versions can differ in character and style and reach completely different audiences.

We looked closely at the 50 most popular cover songs as well as the original works. Galaxy of Covers is the result of this analysis and allows you to explore the evolution from idea to recording.

About the Visualization

The panorama view shows the 50 top songs as individual planetary systems with the original work as the sun. Each planet represents a version of the song and it's appearance indicates characteristics including genre, popularity, tempo, valence, energy, and speechiness. The radius of its orbit around the sun shows the years between the publication dates. This view allows you to compare the structure and density of the constellation of different songs from a high-level perspective.

The detail view lists the versions of one song in cross section. The characteristics and positioning of the planets is consistent with the panorama. This view allows you to compare different versions of the same song individually.

Sources

The dataset that drives this application is retrieved from the following sources:

- BBC: List of 50 most popular cover songs.
- Echonest: Information on tempo, valence, energy, and speechiness.
- Spotify: Information on popularity.
- Secondhand Songs: Information on cover version, artist, and date.
- Whosampled: Information on music genre.

Technology

The visualization is hand crafted with standard web technologies HTML, CSS, JavaScript using open source software including D3, React, Webpack among others. Please refer to our Github repository for more details.

Credits

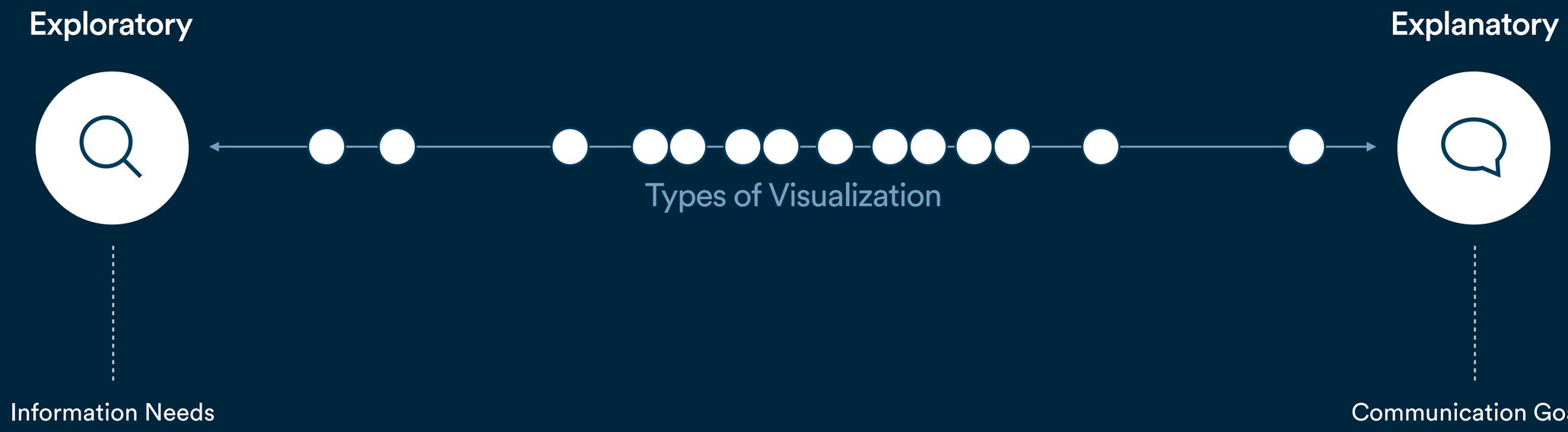
Galaxy of Covers has been created by Interactive Things, a digital product design studio based in Zürich, Switzerland. Research, concept, design, and development was done by Tania Boa, Ilya Boyandin, Mark Hintz, Jan Wächter, and Benjamin Wiederkehr.

https://lab.interactivethings.com/galaxy-of-covers/

3.2

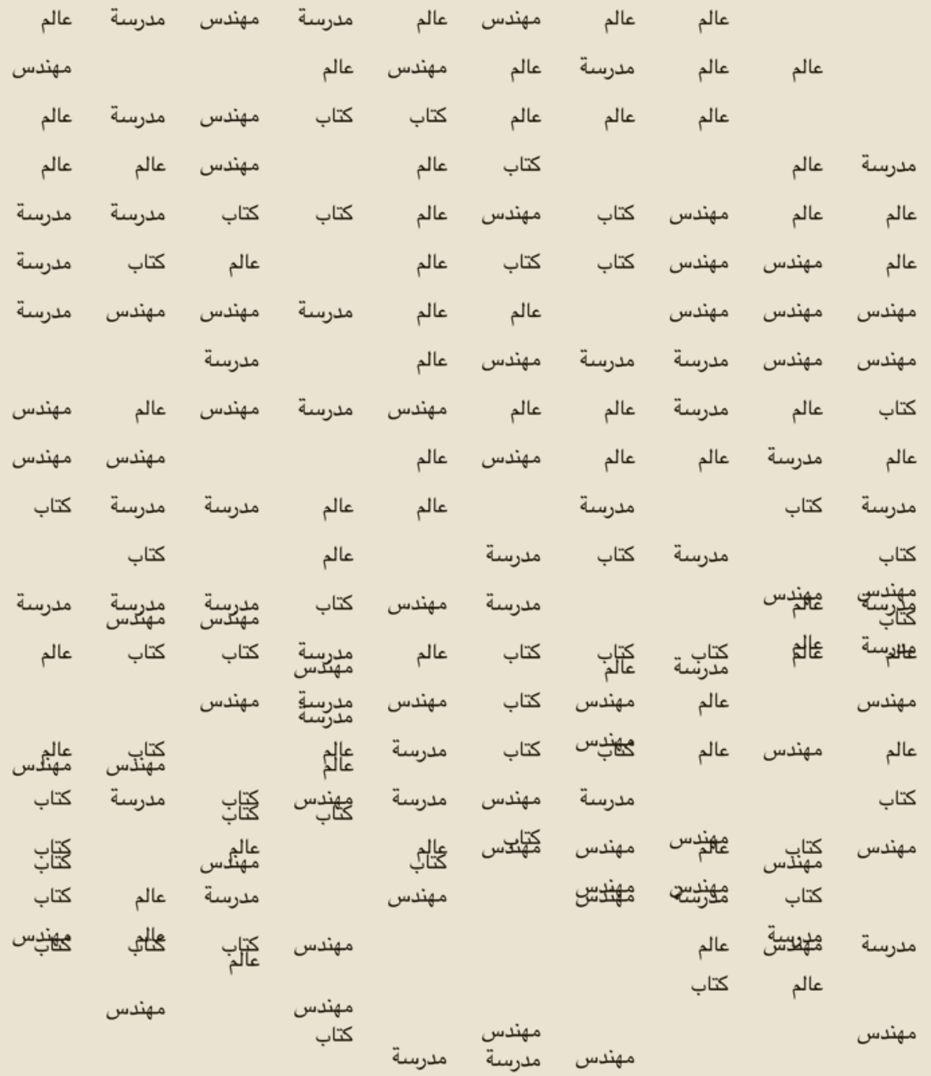
Exploration & Explanation

Author-driven and user-driven visualizations.


Exploratory
Explanatory
Types of Visualization
Information Needs
Communication Goals

The road to school

The Syrian conflict is robbing millions of children of their right to education.



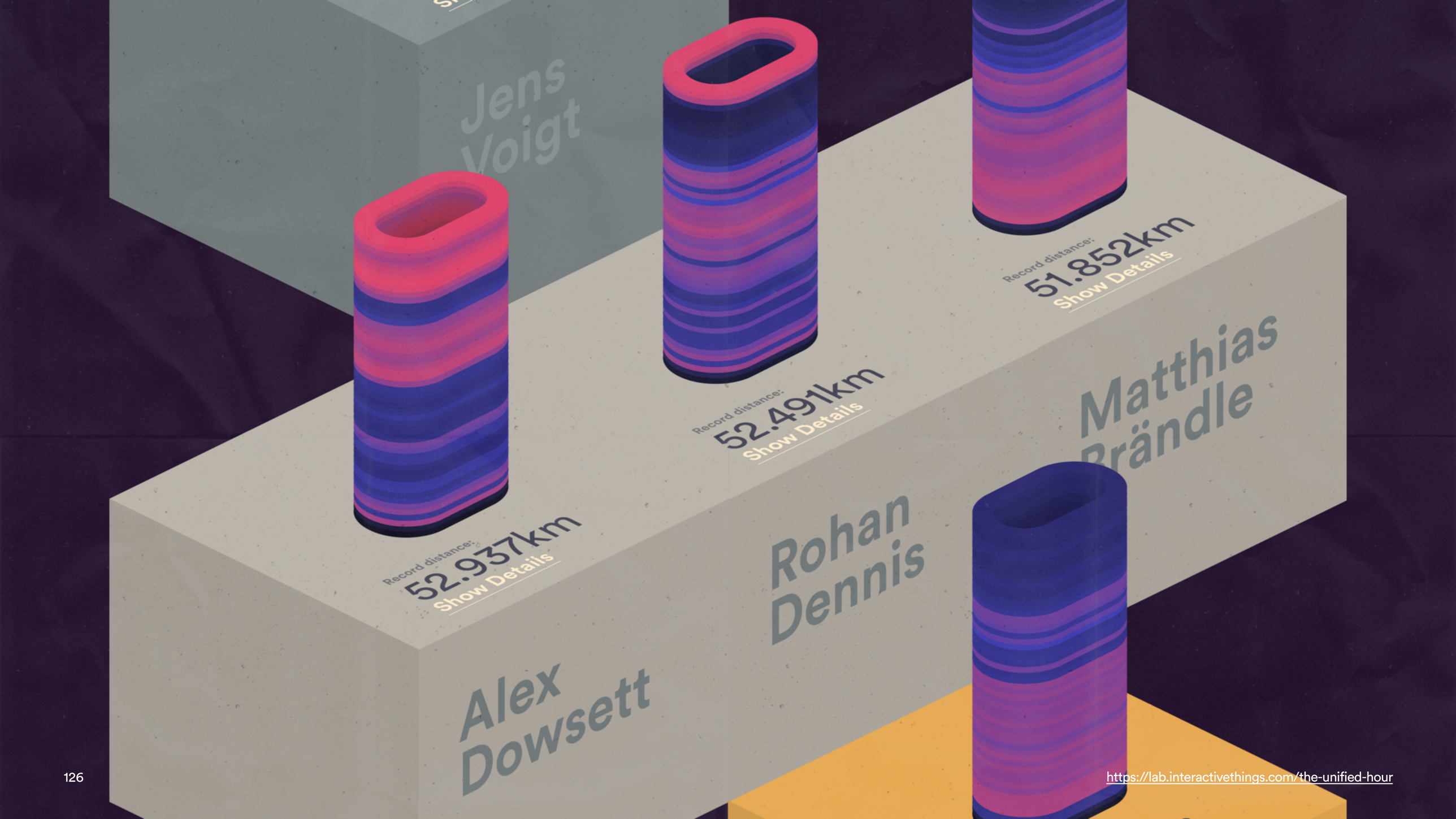
https://lab.interactivethings.com/road-to-school/

The world's import from and export to Africa visualized

GLOBAL TRADE: AFRICA

Explore the data

https://lab.interactivethings.com/global-trade-africa/

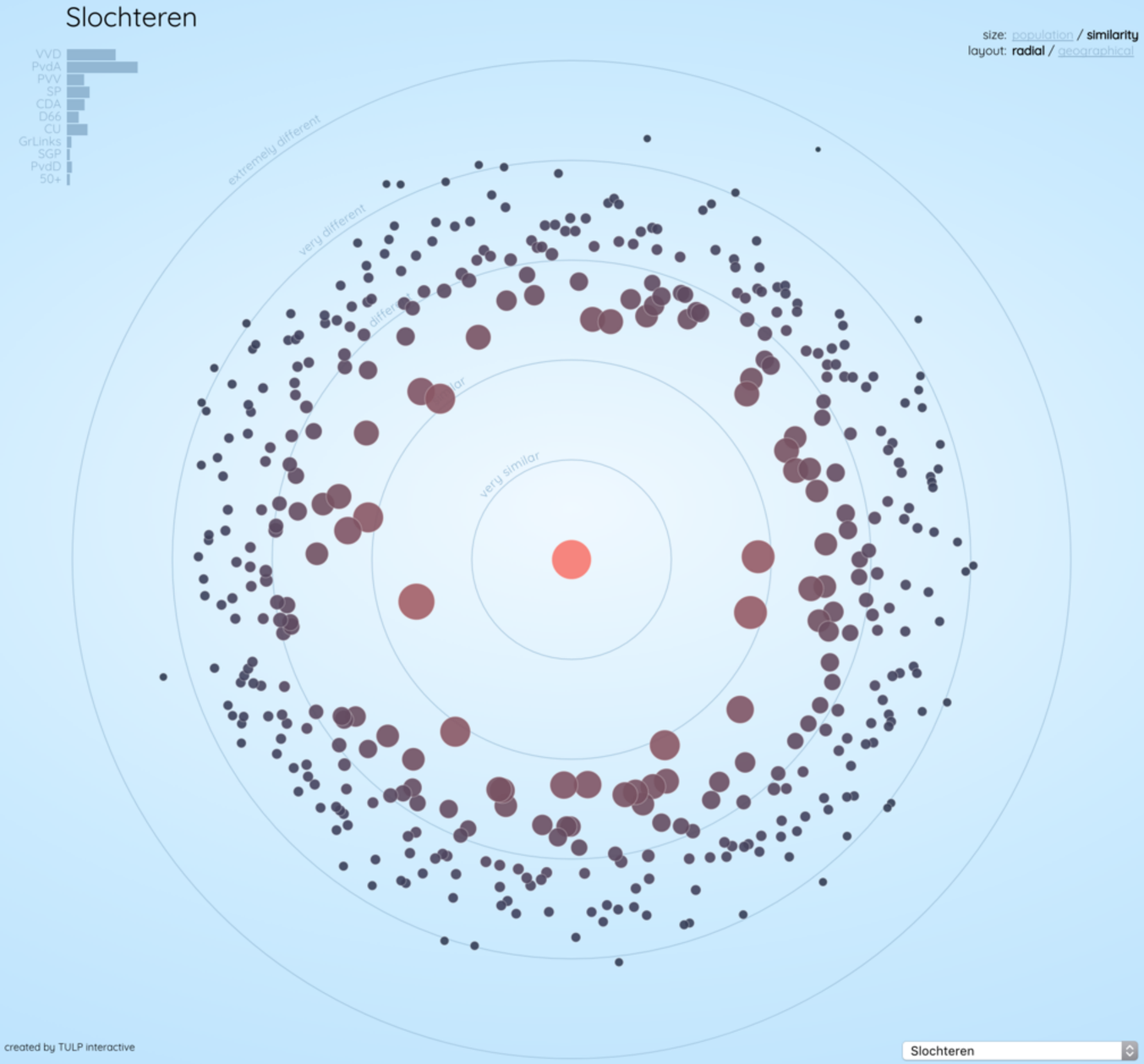


https://lab.interactivethings.com/the-unified-hour

CLOSE VOTES

Which cities vote like yours?

Based on the 2012 parliament elections in The Netherlands, this visualization shows which cities distribute their votes similar over the political parties



created by TULP interactive

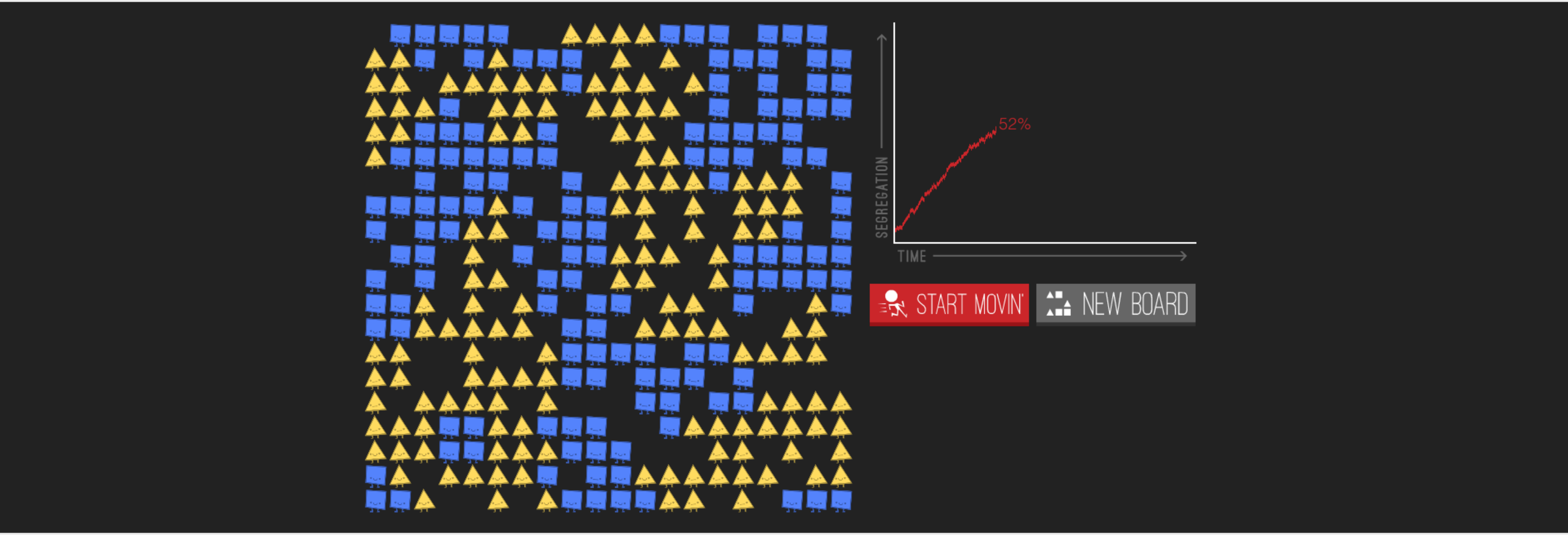
http://tulpinteractive.com/close-votes/

Explorable Explanation

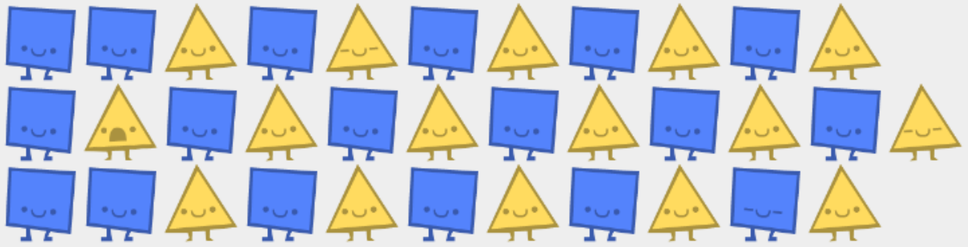
Learning through play.

http://explorabl.es/

run this simulation a few times. what happens?



What's up with that? These are good shapes, nice shapes. And yet, though every individual only has a slight bias, the entire shape society cracks and splits.



http://ncase.me/polygons/

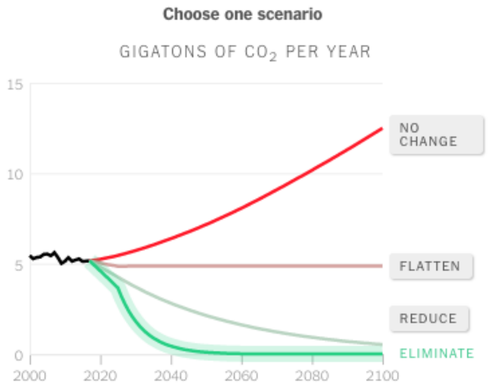
YOU FIX IT

Can you get us within the climate budget?

This climate simulator lets you explore **more than 8,100 climate scenarios**, based on a model developed by Climate Interactive and the M.I.T. Sloan School of Management.

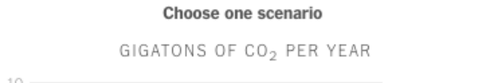
United States

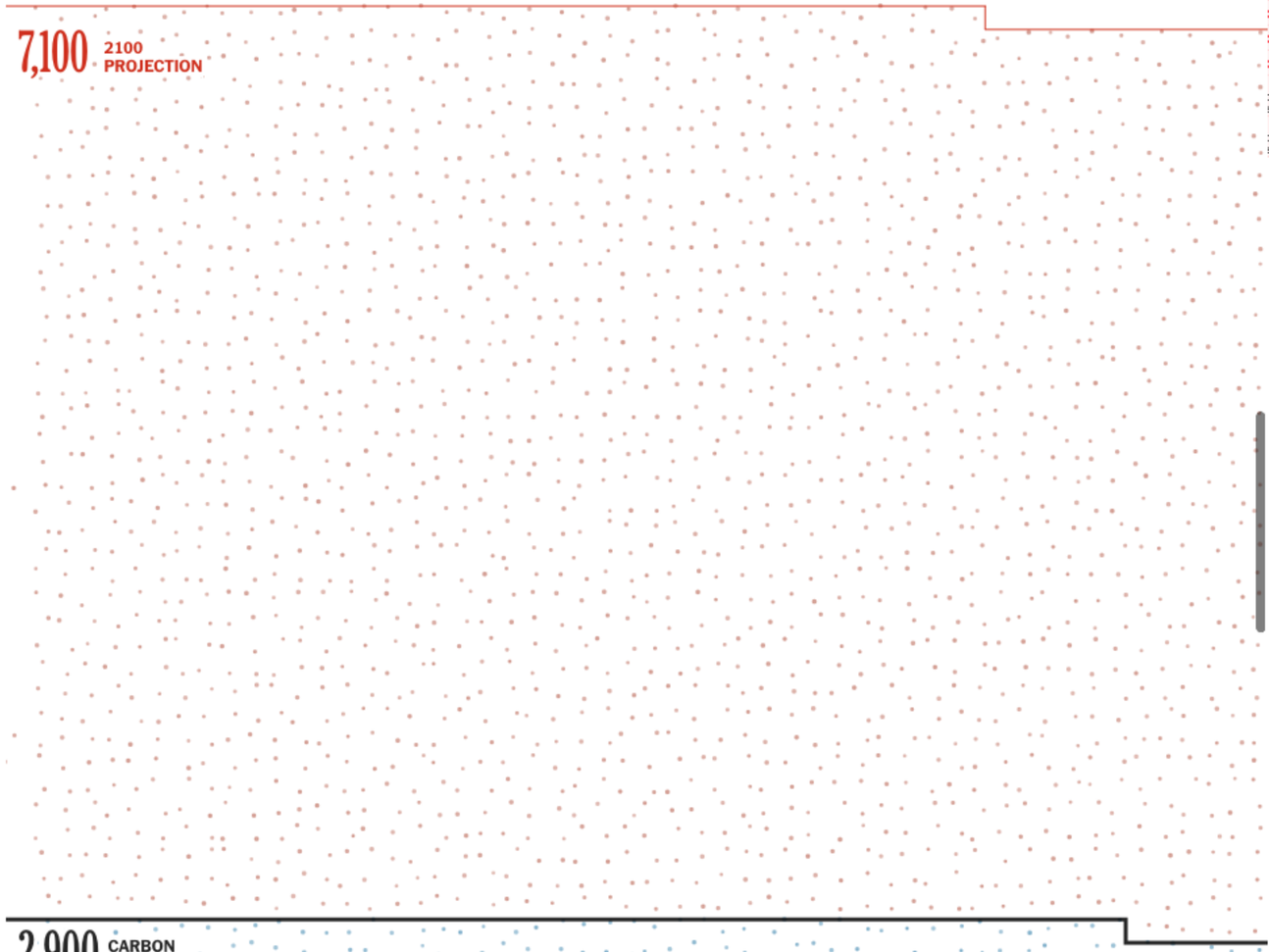
In June, the United States announced it would pull out of the Paris accord, making it unlikely to meet the modest targets outlined in the agreement. But many states, cities and businesses have also vowed to do what they can to reduce emissions.



European Union

The E.U. has been an influential force in global climate policy for many decades.





https://www.nytimes.com/interactive/2017/08/29/opinion/climate-change-carbon-budget.html

Can You Live on the Minimum Wage?

By JEREMY ASHKENAS FEB. 8, 2014

More than 4.8 million workers now earn the lowest legal pay. This calculator, for a single childless worker, shows the hard choices that have to be made living on the smallest paychecks.

Start by choosing your state: New York

The minimum wage in New York is **$8.00** an hour. Tally your living expenses by entering what you think is the least you need for each item. You may find that even your rock-bottom expenses aren't met and that you have to work more hours, pay your bills late, borrow money or do without. Related Editorial »

Housing

Enter monthly rent or mortgage payments (and don't forget insurance, if this is paid separately) that you would expect to pay for a modest apartment or home in your area.

$ Monthly

Utilities and Services

Electricity, gas, heating oil, telephone, cable, Internet — add them up.

$ Monthly

Transportation

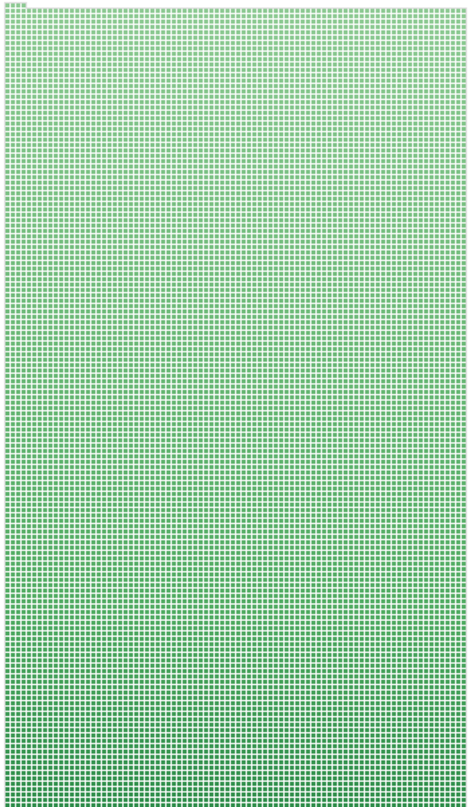
Your car comes with fuel, maintenance and repair costs, as well as insurance. Car-free? Enter your bus, taxi, subway or train fare.

$ Monthly

Health Care

Very few low-wage employers provide health insurance. Enter your monthly premiums, plus expected out-of-pocket medical payments. If eligible for Medicaid or other discounted health care under the Affordable Care Act, this number could be significantly reduced.

$ Monthly



https://www.nytimes.com/interactive/2014/02/09/opinion/minimum-wage.html

Could a Democrat Actually Win a Senate Seat in Alabama? Precedents Are Few, but Telling

PUBLIC HEALTH

Obamacare's Insurance Mandate Is Unpopular. So Why Not Just Get Rid of...

What Red States Are Passing Up as Blue States Get Billions

Steve Jurvetson Quits Venture Capital Firm Amid Investigation

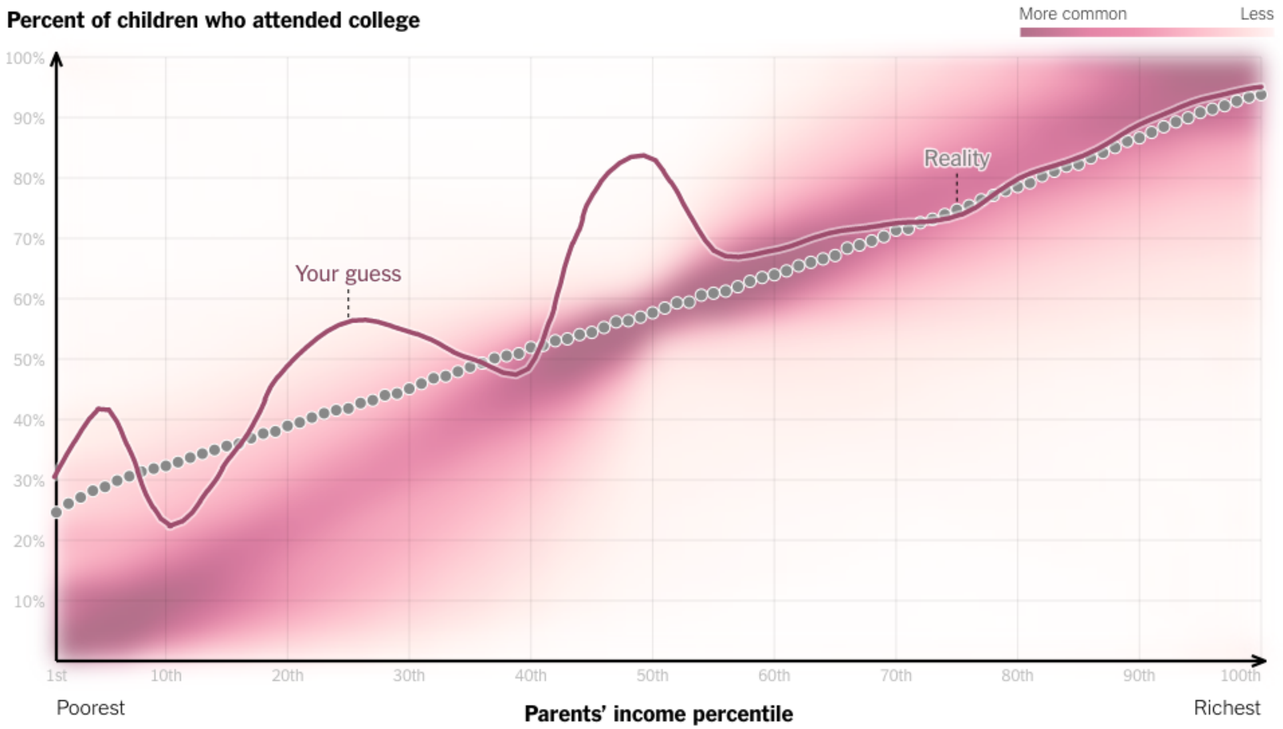
THE NEW HEALTH CARE

Kept in the Dark About Doctors, but Having to Pick a Health Plan

THE NEW HEALTH CARE

A Link Between Alcohol and Cancer? It's Not Nearly as Scary as It...

The Ordi in th

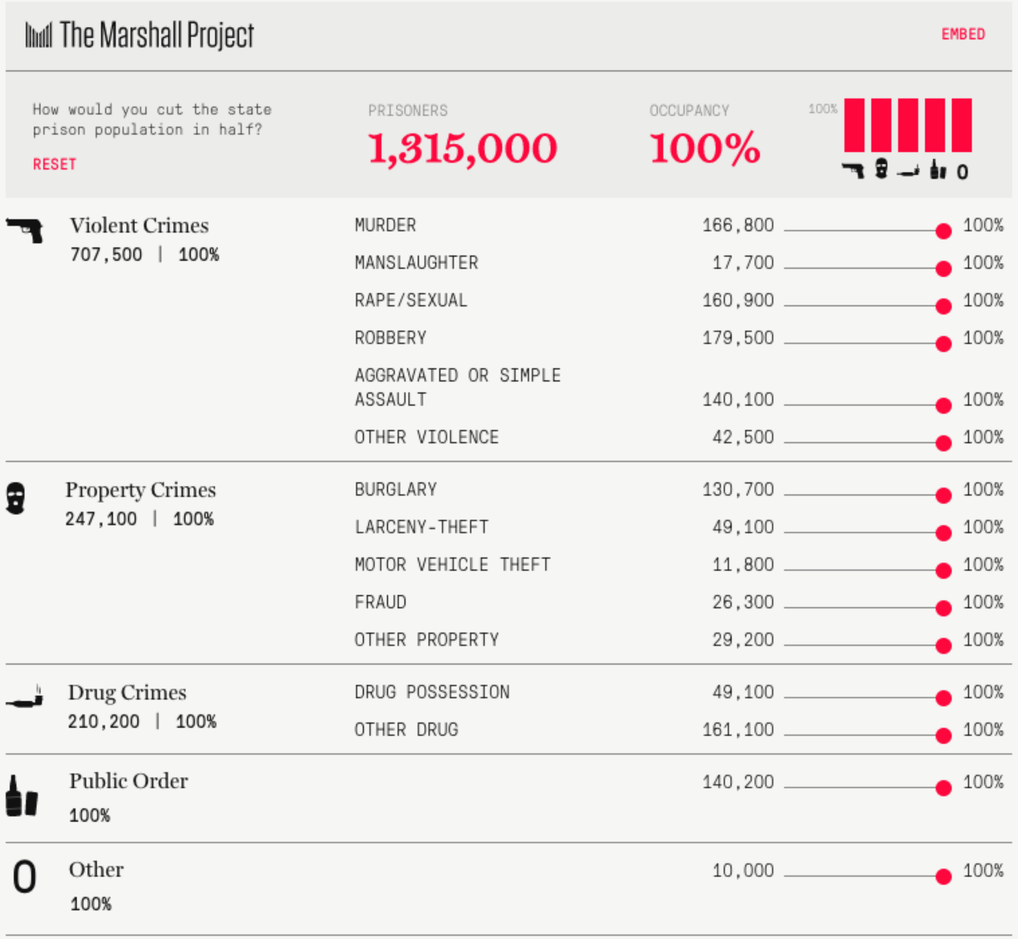


Moving up a single percentile on the family-income distribution makes enrolling in college about 0.7 percentage points more likely, up and down the distribution. Whether you're a poor child getting a little bit less poor or a rich child getting slightly more rich, every step counts about the same.

Why would a child from the 99th percentile be more likely to go to college than a child from the 93rd? There seem to be several reasons. The rise in inequality in recent decades means that there is now quite a large income gap between the very rich and merely affluent: A tuition bill could scare off a family making $100,000 in a way it would not scare off one making $1 million. The very rich often send their children to different high schools, too, which may improve their chances of going to college. And the very rich are themselves more likely to have

https://www.nytimes.com/interactive/2015/05/28/upshot/you-draw-it-how-family-income-affects-childrens-college-chances.html

How would you Cut 50? In SCENARIO ONE, all property, drug, public order, and "other" offenders would avoid state prison time or be released early, in addition to 30 percent of those convicted of robbery. In SCENARIO TWO, half of robbery and assault offenders would be released or never incarcerated, in addition to 3 percent of sex offenders, three-quarters of property and drug offenders and 100 percent of public order and "other"offenders.



SOURCE: BUREAU OF JUSTICE STATISTICS

Public order crimes include prostitution and driving under the influence. Burglary is unlawful entry into a home. Robbery is theft that includes the threat or use of force. "Other" crimes include juvenile and unspecified offenses.

https://www.themarshallproject.org/2015/03/04/how-to-cut-the-prison-population-by-50-percent

3.3

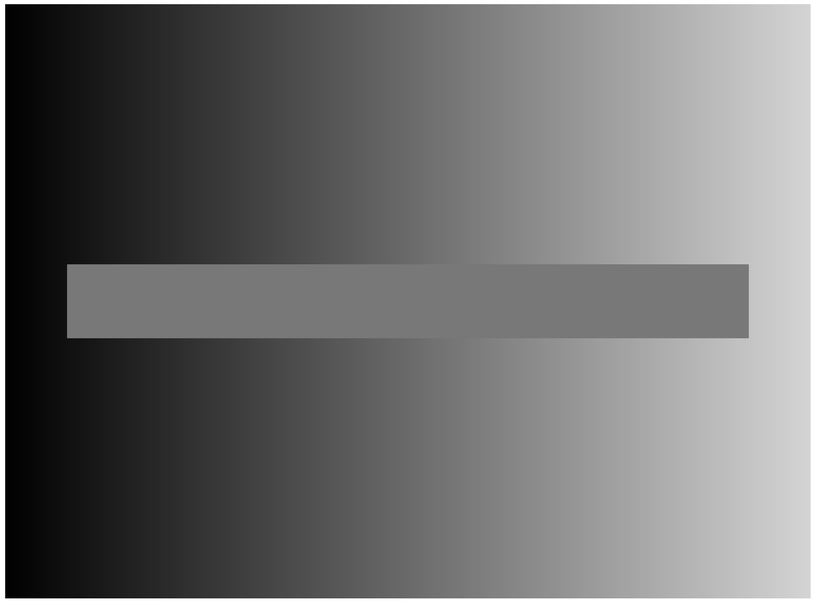
Color

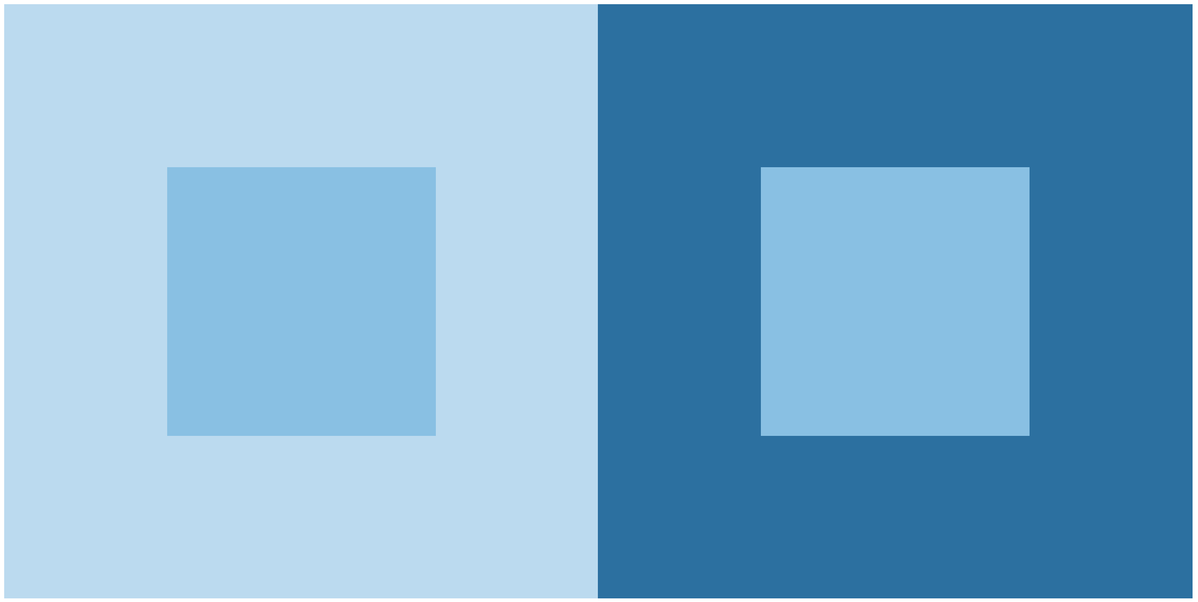
How to master the art and science of picking colors.

Color Theory

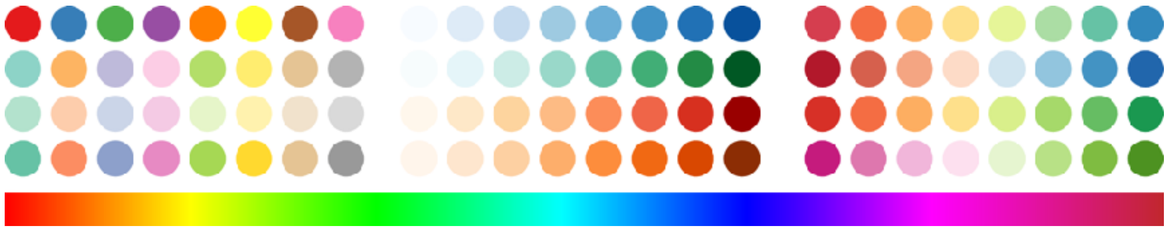
- Colors are hard
- We’re only touching a few basics
- Please read Subtleties of Color by Robert Simmon and any / all of the related articles listed on the Wiki page

Color Perception

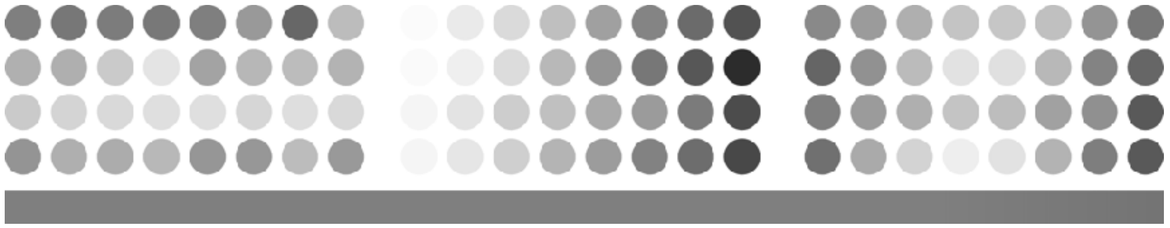




Color and Greyscale



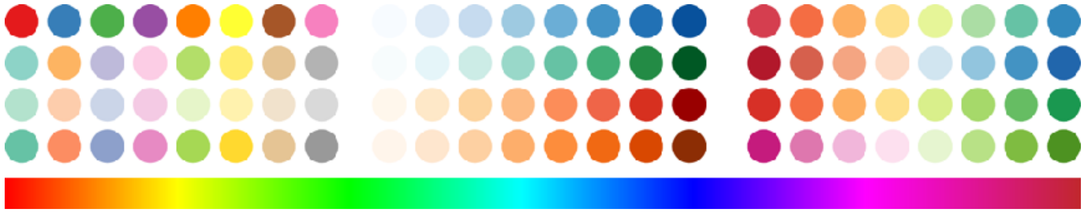
Color Brewer Palettes



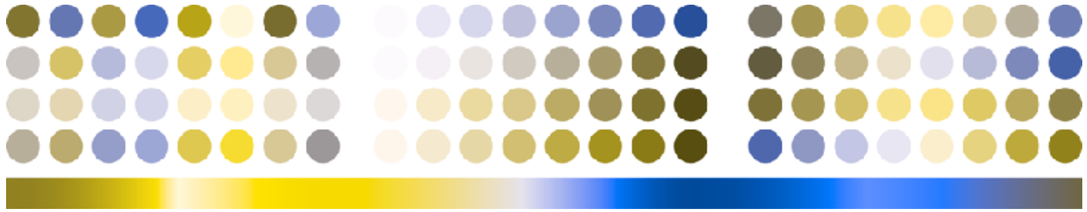
Color Brewer Palettes in Greyscale

Color Blindness

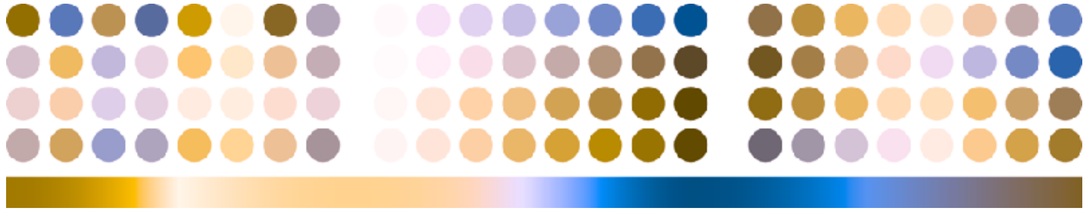
Normal Vision



Impaired Vision



Protanopia (Red-Greed) — 1% of Humanity



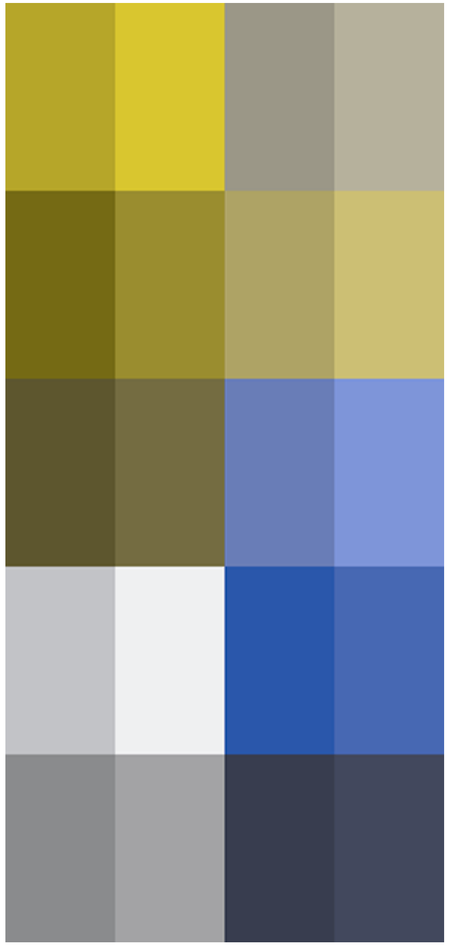
Deuteranopia (Red-Greed) — 1% of Humanity

Tritanopia (Blue-Yellow) — <1% of Humanity

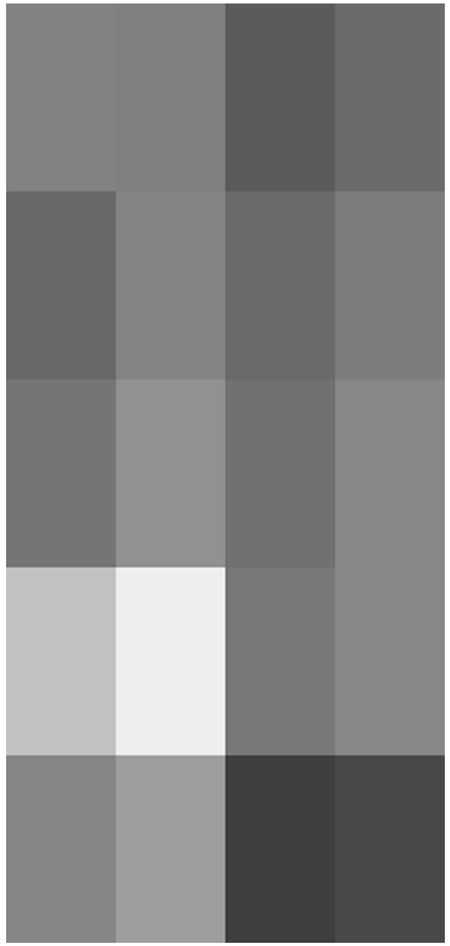
Example: Flat UI Colors

Normal Vision

Protanopia

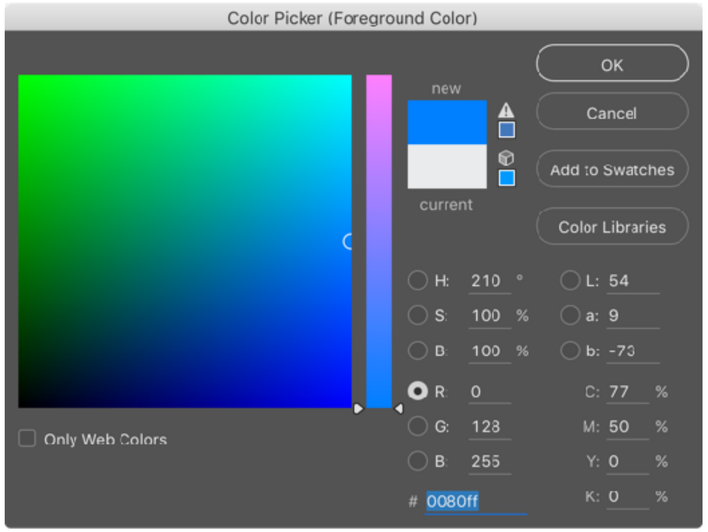


Greyscale

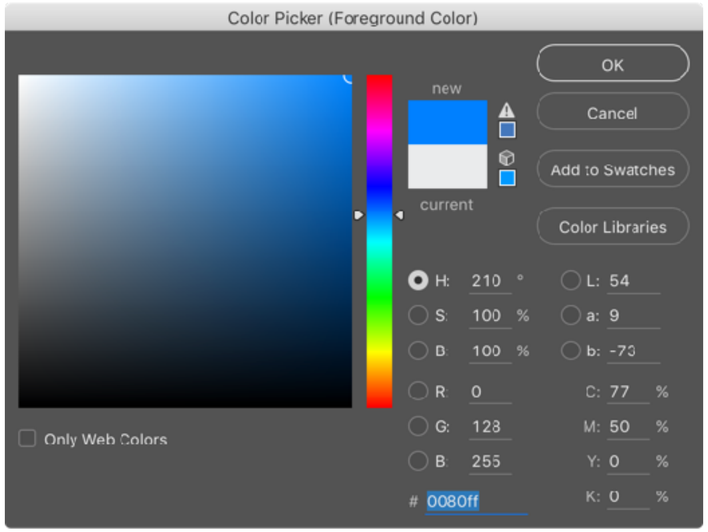


Color Spaces

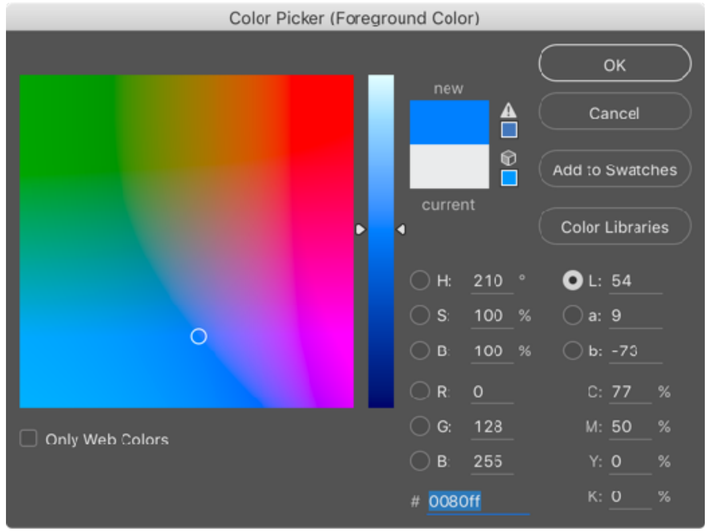
RGB



HSV



CIE Lab / LCh



Perceptual Uniformity

HSL

HCL

😍

Lab

😍

RGB

Color Scales

Qualitative Scales

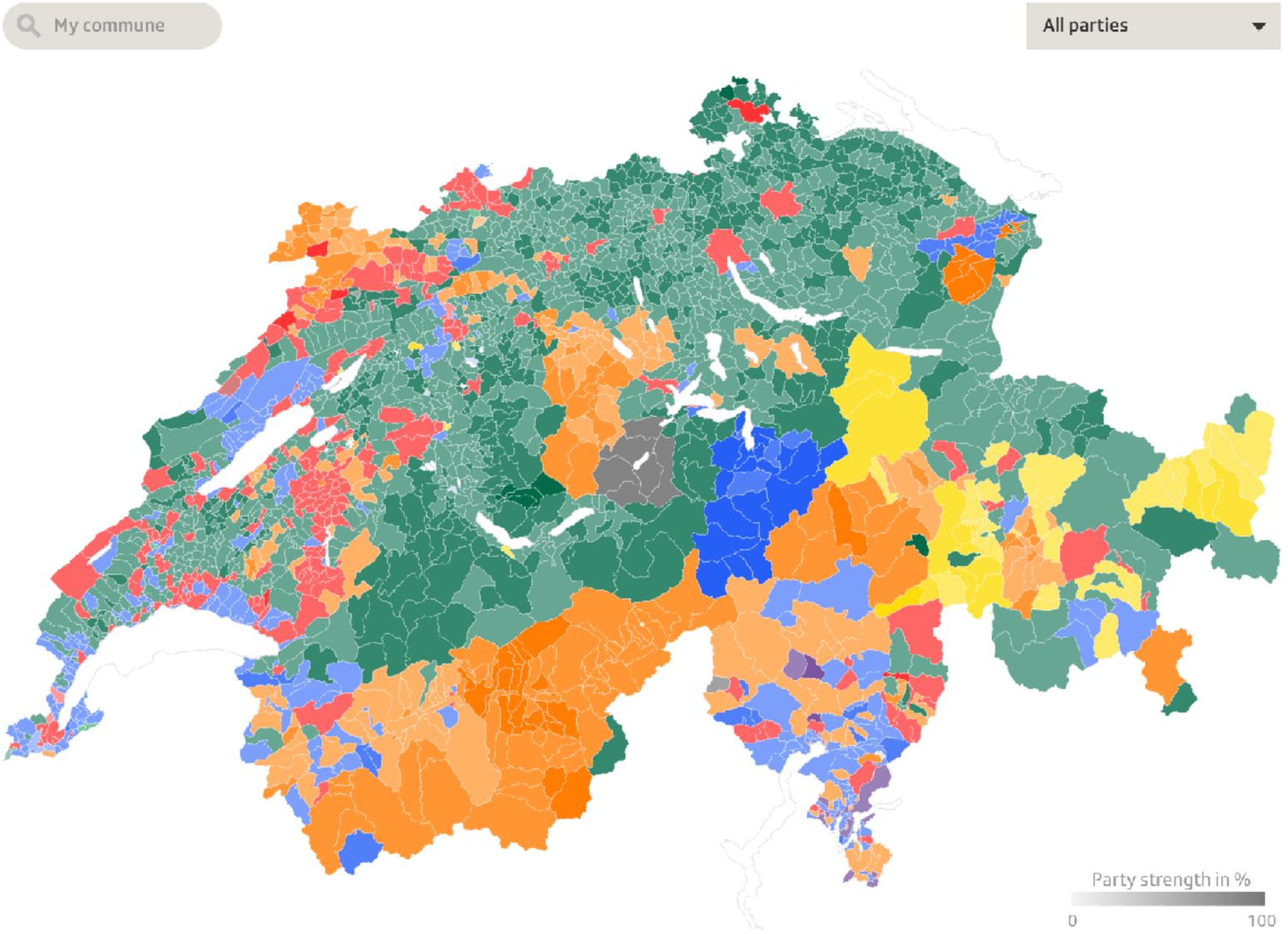
Used for categorical data like song genres or animal families.

Sequential Scales

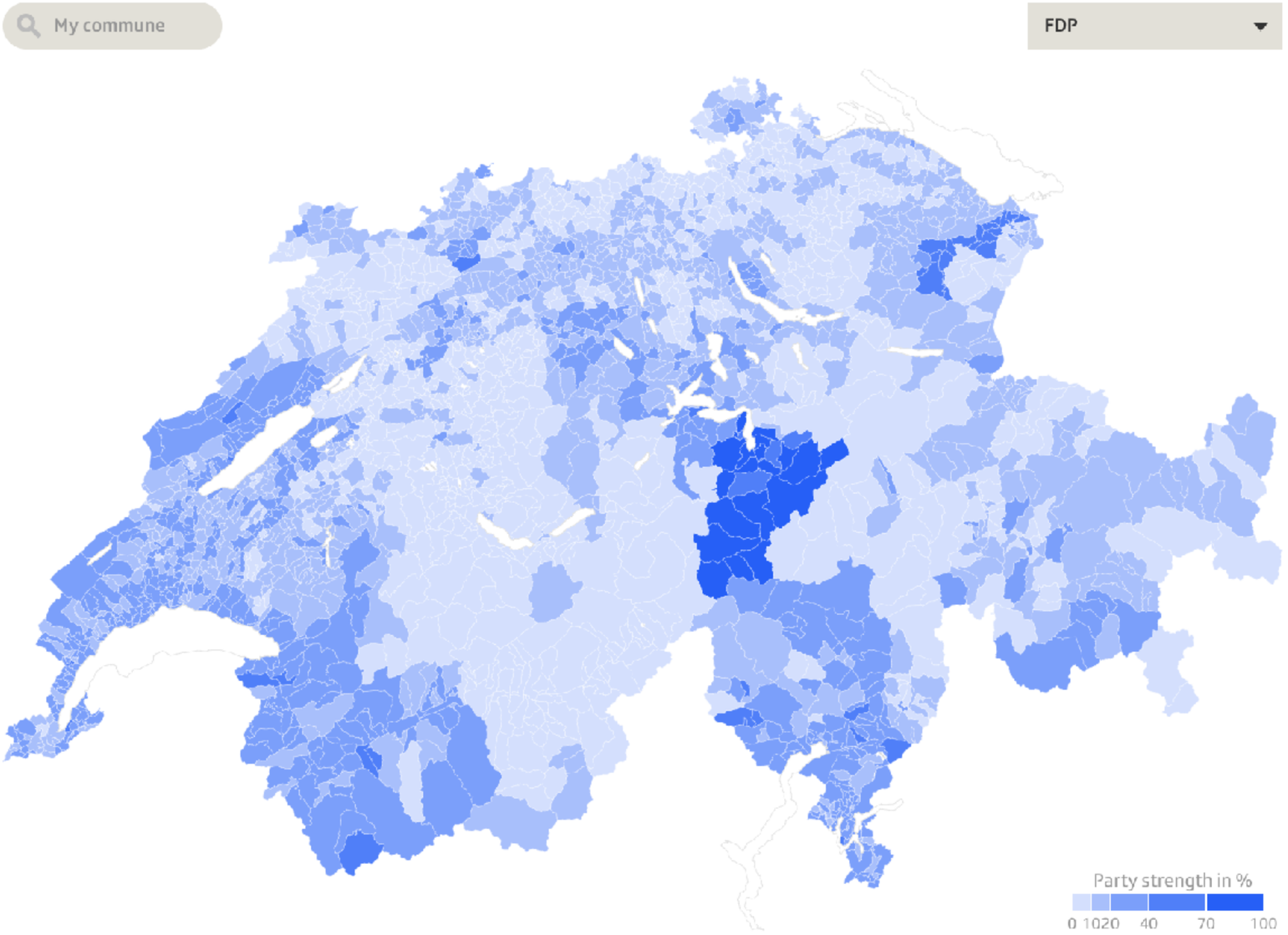
Used for unidirectional ordered data like length, weight, or wealth quintiles.

Diverging Scales

Used for bidirectional ordered data with a zero point like temperature or elevation.

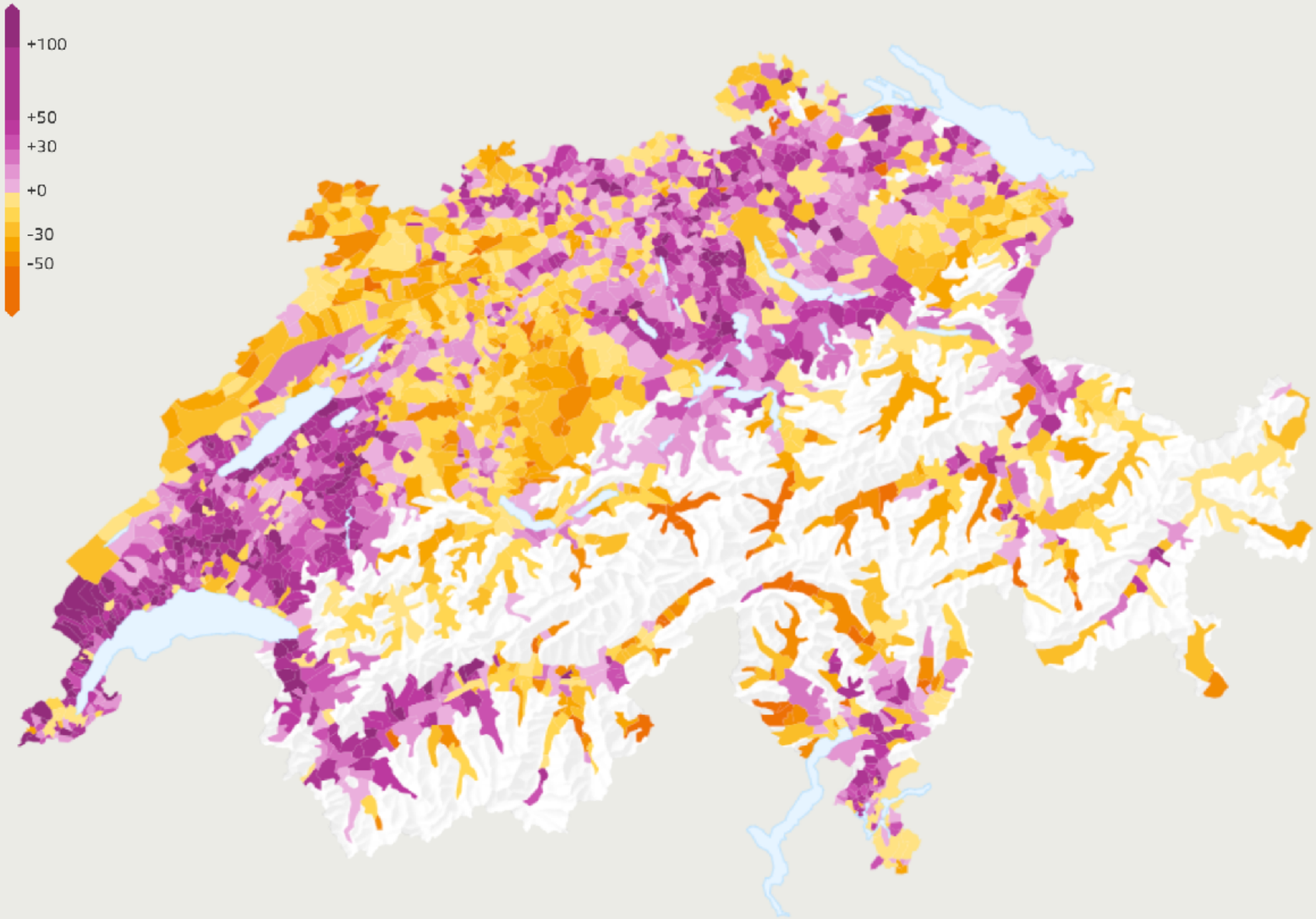


http://work.interactivethings.com/srg-elections-2015/party-strength.html



http://work.interactivethings.com/srg-elections-2015/party-strength.html

Bevölkerungswachstum seit 1981, Abweichung vom Schweizer Durchschnitt



https://www.srf.ch/news/wo-die-schweiz-waechst-und-wo-sie-schrumpft-2

Color Scale Tools

Color Brewer
Guideline to pick good color palettes without worrying too much about the details.

Colorpicker for Data
Simple tool to generate and pick good colors from the HCL color space.

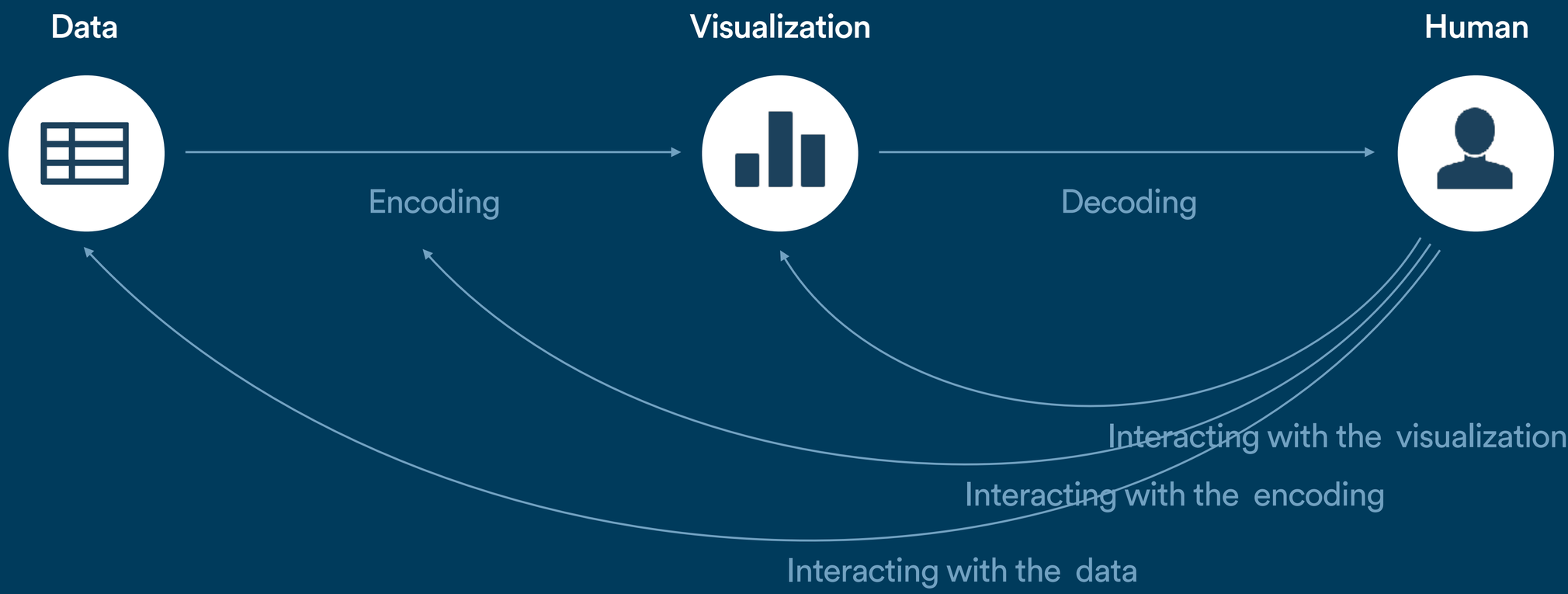
I Want Hue
Advanced tool to generate, correct, and export complete palettes of optimally distinct colors.

HCL Wizard
Advanced tool to generate, validate, refine, and export scales of optimally distinct colors.

3.4

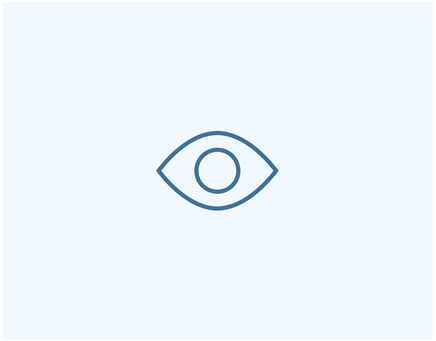
Interaction

How people interact with a visualization.

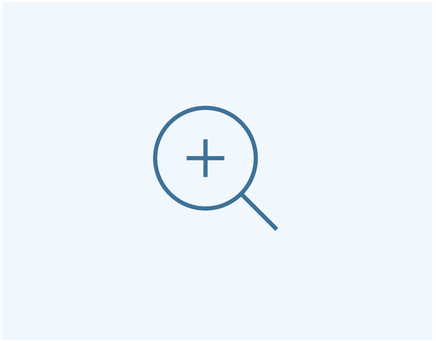

Data
Visualization
Human
Encoding
Decoding
Interacting with the visualization
Interacting with the encoding
Interacting with the data

Task Taxonomy

Overview



Zoom



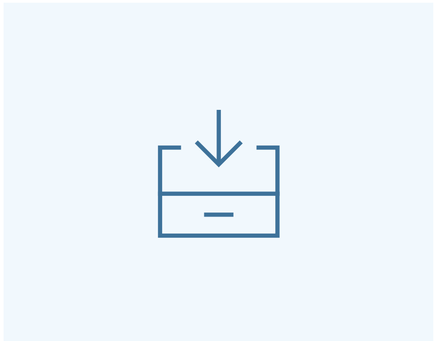
Filter

Details

Relate

History

Extract



Shneidermann, B — The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations

Visual Information Seeking Mantra

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Overview first, zoom and filter, then details-on-demand

Shneidermann, B — The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations

Mike Matas at TED 2011 — A New -Generation Digital Book

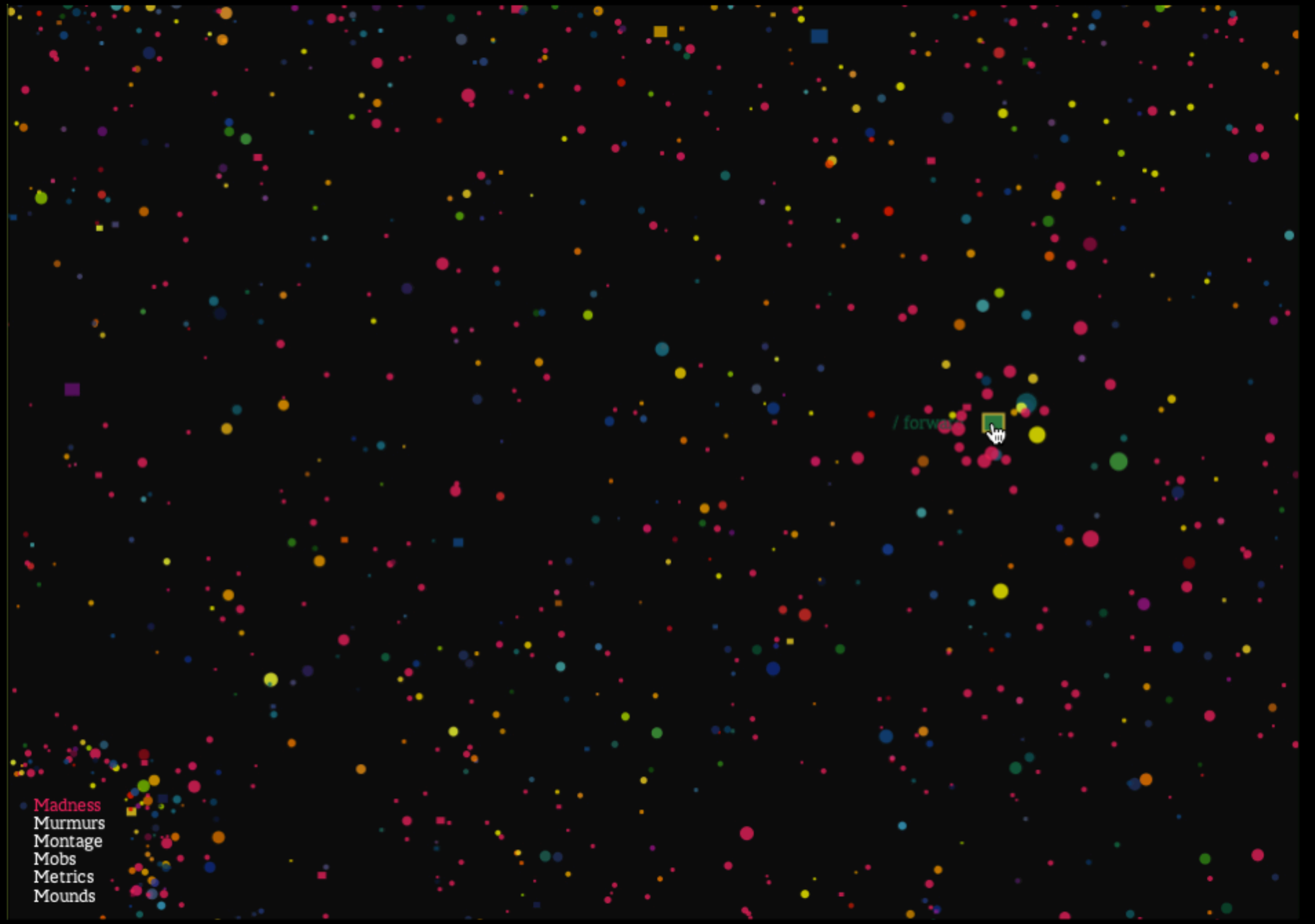
3.5

Animation

What role animation can play in visualization.

Animation as …

- Attribute



Jonathan Harris & Sep Kamvar: We Feel Fine

0.01 mSv

Röntgenaufnahme eines Zahns

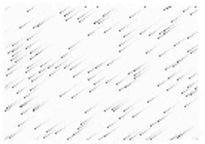
0.055 mSv

Einfacher Flug Europa – USA

1 mSv

Jahresdosisgrenzwert Schweiz

1.4 mSv



1 Schachtel Zigaretten ohne Filter rauchen

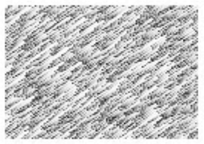
2.3 mSv

1 Jahr als Flugbegleiter arbeiten

5.5 mSv

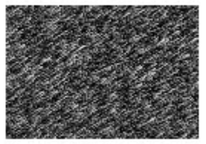
Strahlenbelastung in der Schweiz

20 mSv



Grenzwert für strahlen-exponiertes Personal

100 mSv



Schwellendosis

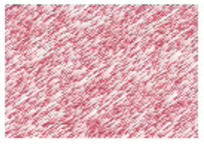
2 mSv

Grenzwert auf Spiel-platz in Fukushima

4.4 mSv

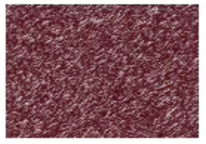
Zone mit 0.5 µSv/h

35 mSv



Zone mit 4 µSv/h

140 mSv



Zone mit 16 µSv/h

400 mSv

AKW Fukushima am 14. März 2011 (pro Stunde)

STRAHLENBELASTUNG

Die Strahlenbelastung wird in Sievert gemessen. Diese Messeinheit wird auch bei der Analyse des Strahlenrisikos verwendet. Eine Äquivalentdosis von 1 Sievert (Sv) ist ein sehr grosser Wert. Deshalb werden die Werte oftmals in Millisievert (1 mSv) oder Mikrosievert (1 µSv) angegeben. Die Animation zeigt mittlere Werte der Strahlenbelastung durch verschiedene Quellen in Millisievert über den Zeitraum eines Jahres.

STRAHLENBELASTUNG IN FUKUSHIMA

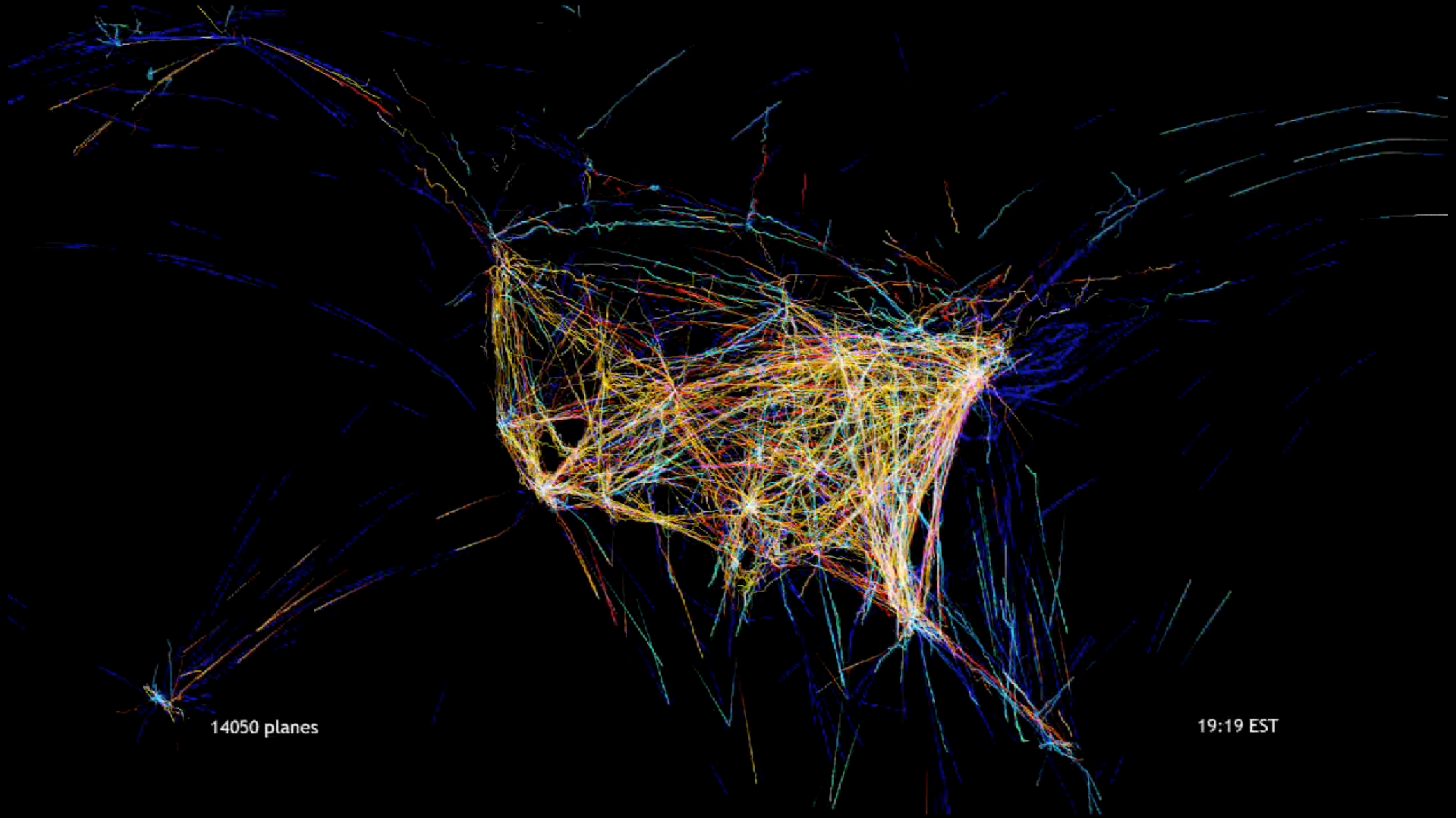
Die Animation zeigt die Strahlenbelastung in verschiedenen Gebieten der Präfektur Fukushima.

STRAHLENBELASTUNG IN FUKUSHIMA DAIICHI

Die maximale Strahlenbelastung im AKW Fukushima Daiichi am 14. März 2011 (pro Stunde).

Animation as …

- Attribute
- Representation

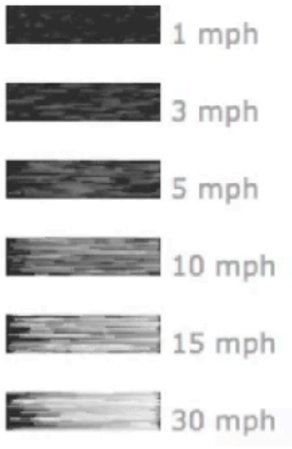


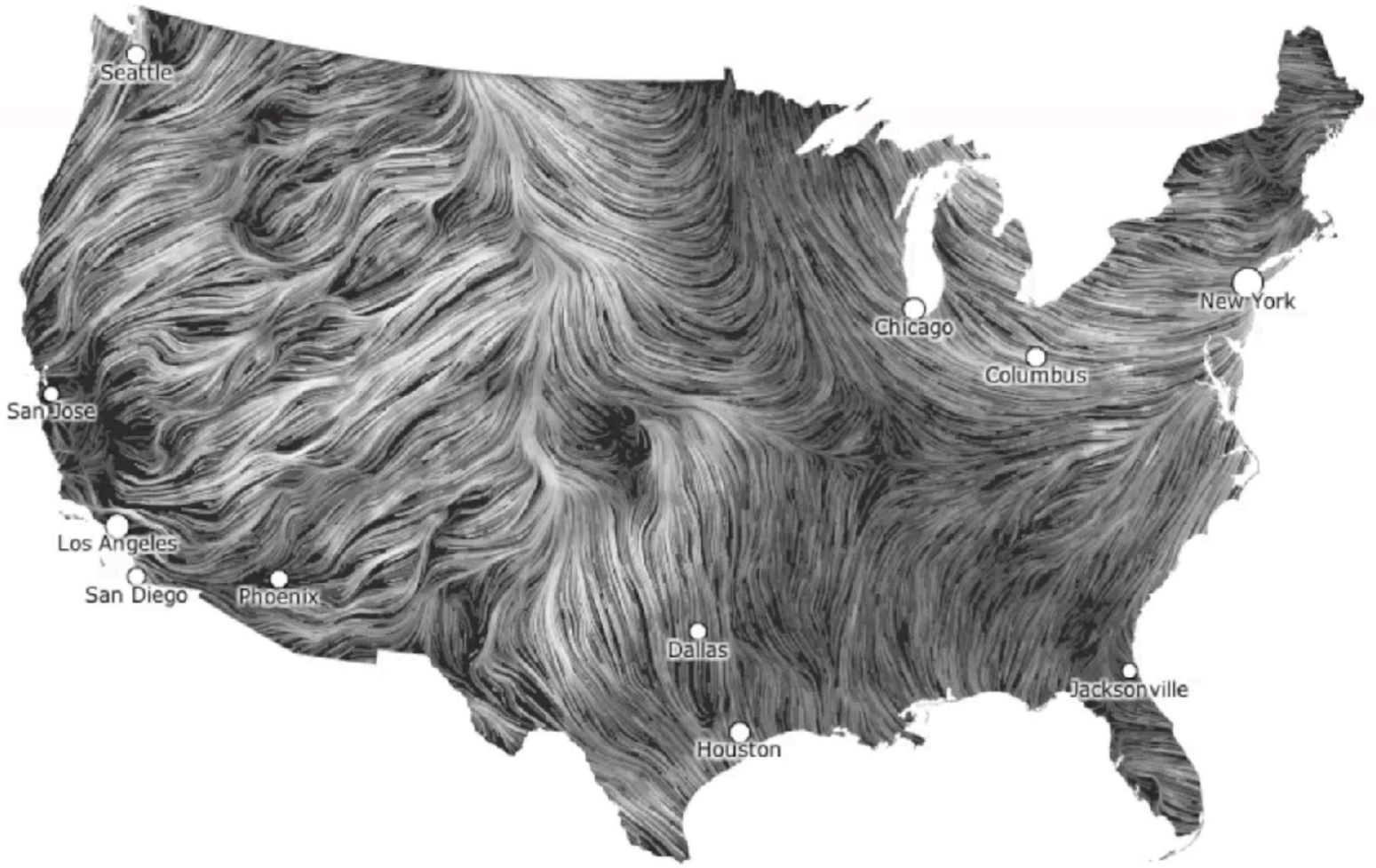
Aaron Koblin: Flight Patterns

wind map

March 28, 2012
at 6:00 pm

top speed: **30.4 mph**
average: **9.4 mph**



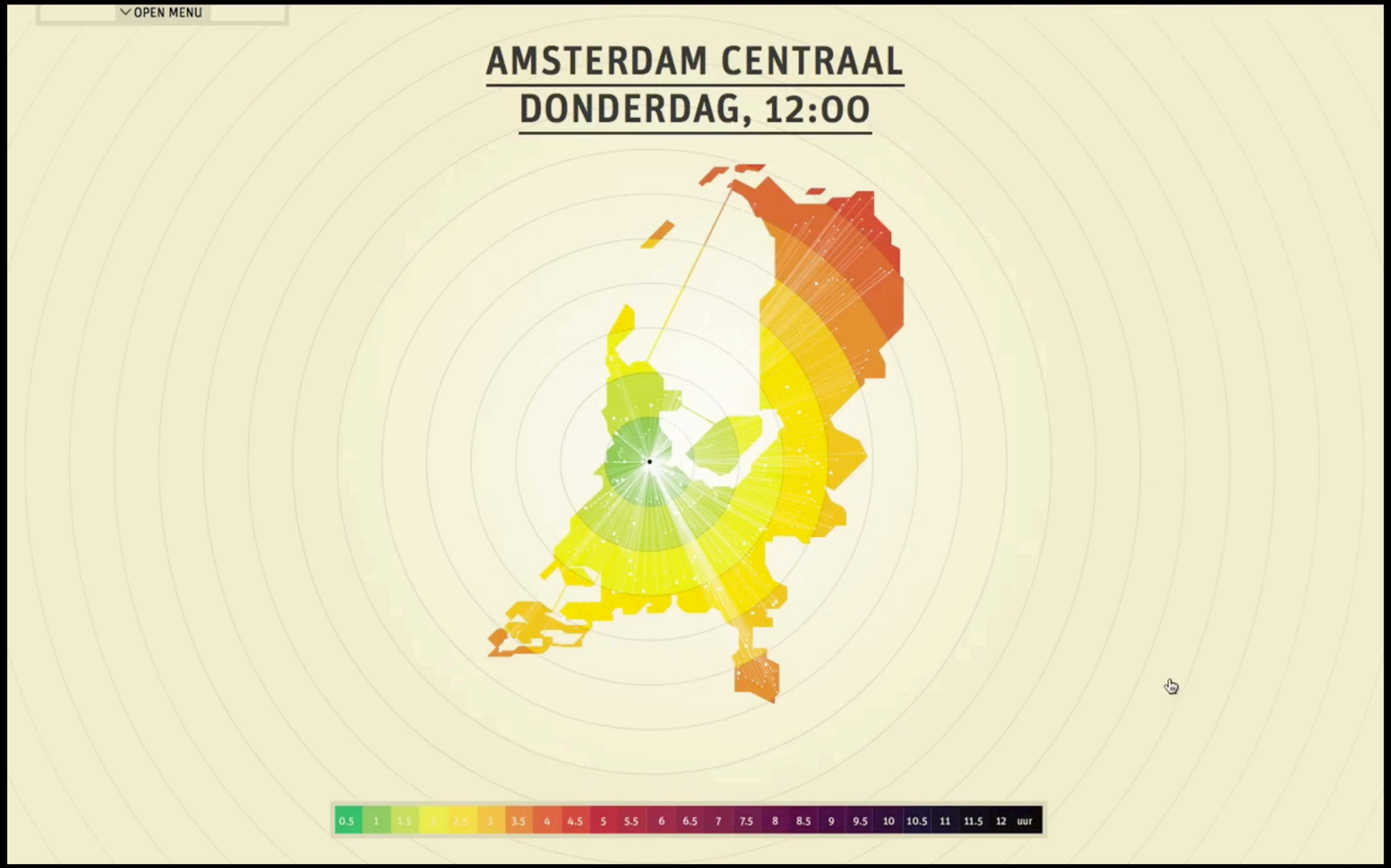


Fernanda Viegas & Martin Wattenberg: Wind Map

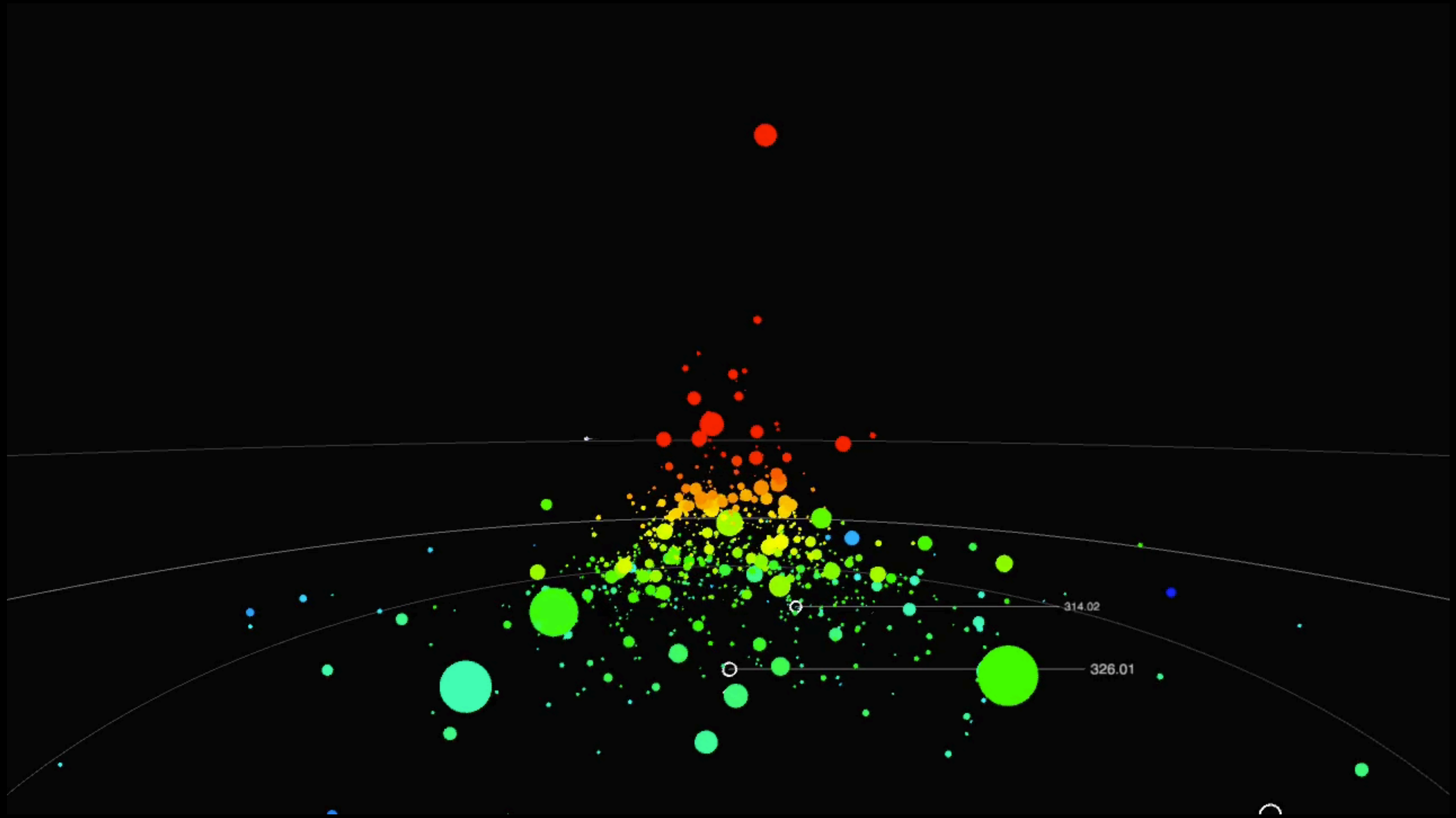
Interactive Things: Ville Vivante

Animation as …

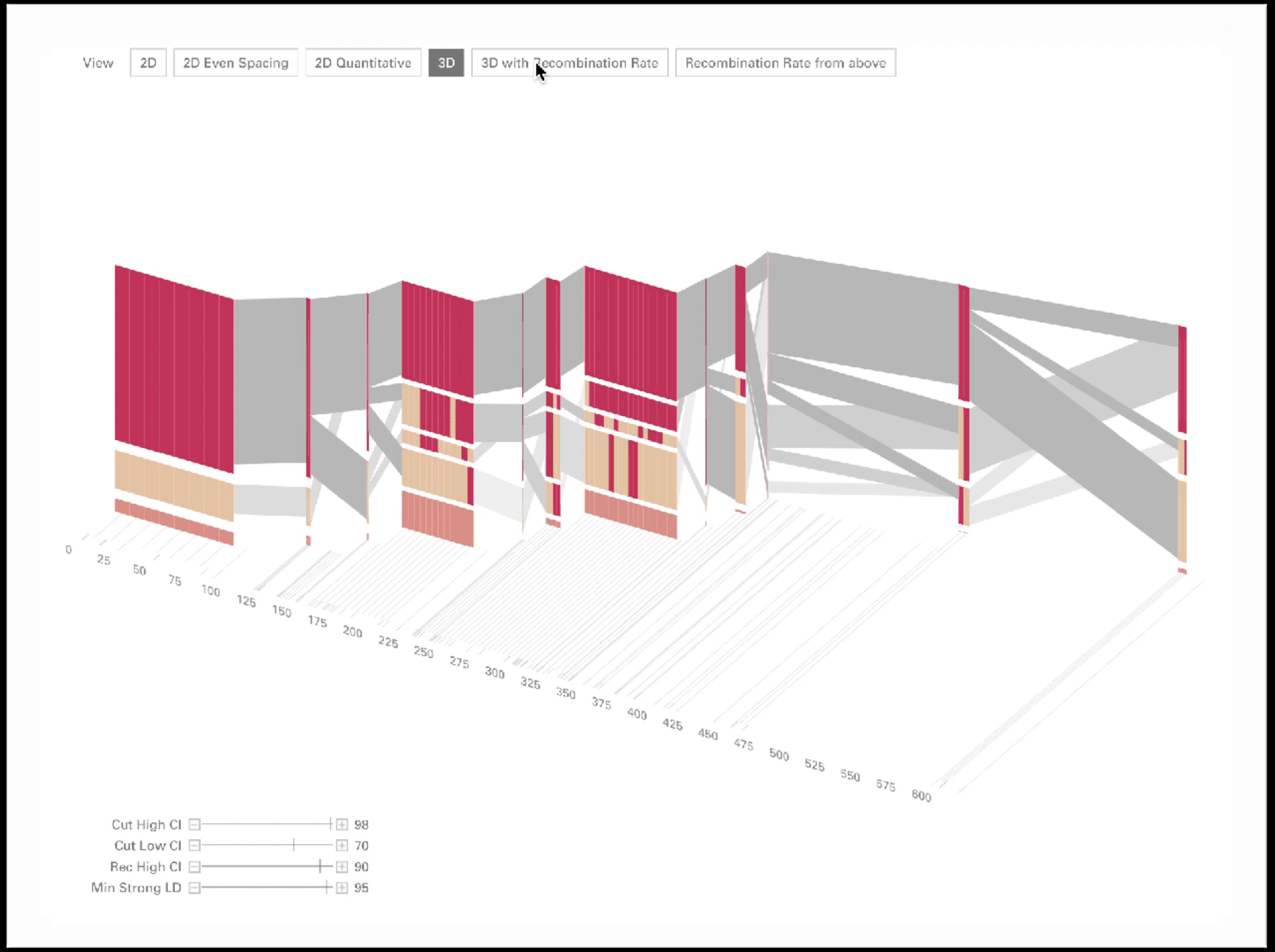
- Attribute
- Representation
- Transition



Vincent Meertens: Timemaps



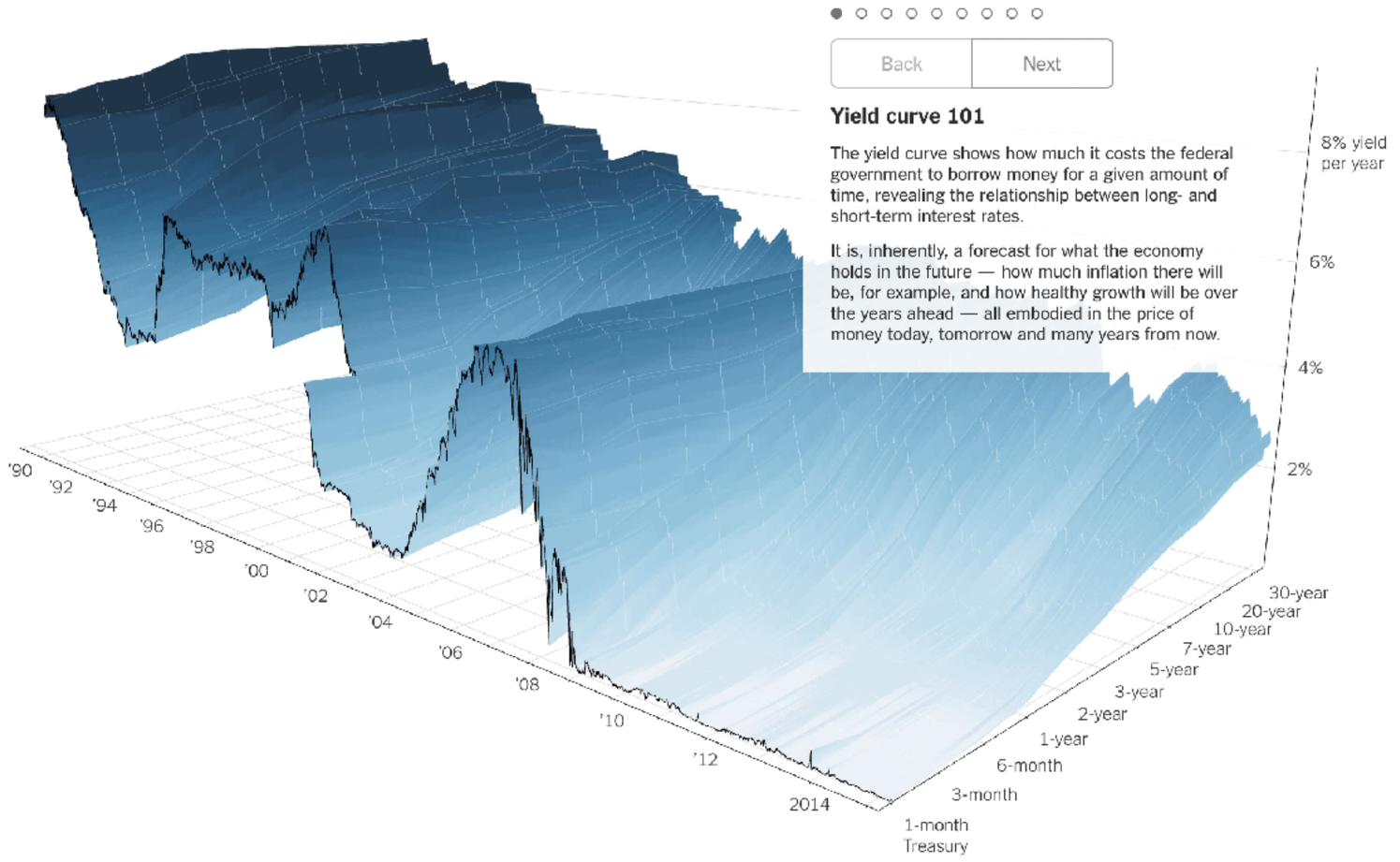
Jer Thorp: Kepler Exoplanet Candidates



Ben Fry: Isometricblocks

A 3-D View of a Chart That Predicts The Economic Future: The Yield Curve

By **GREGOR AISCH** and **AMANDA COX** MARCH 18, 2015

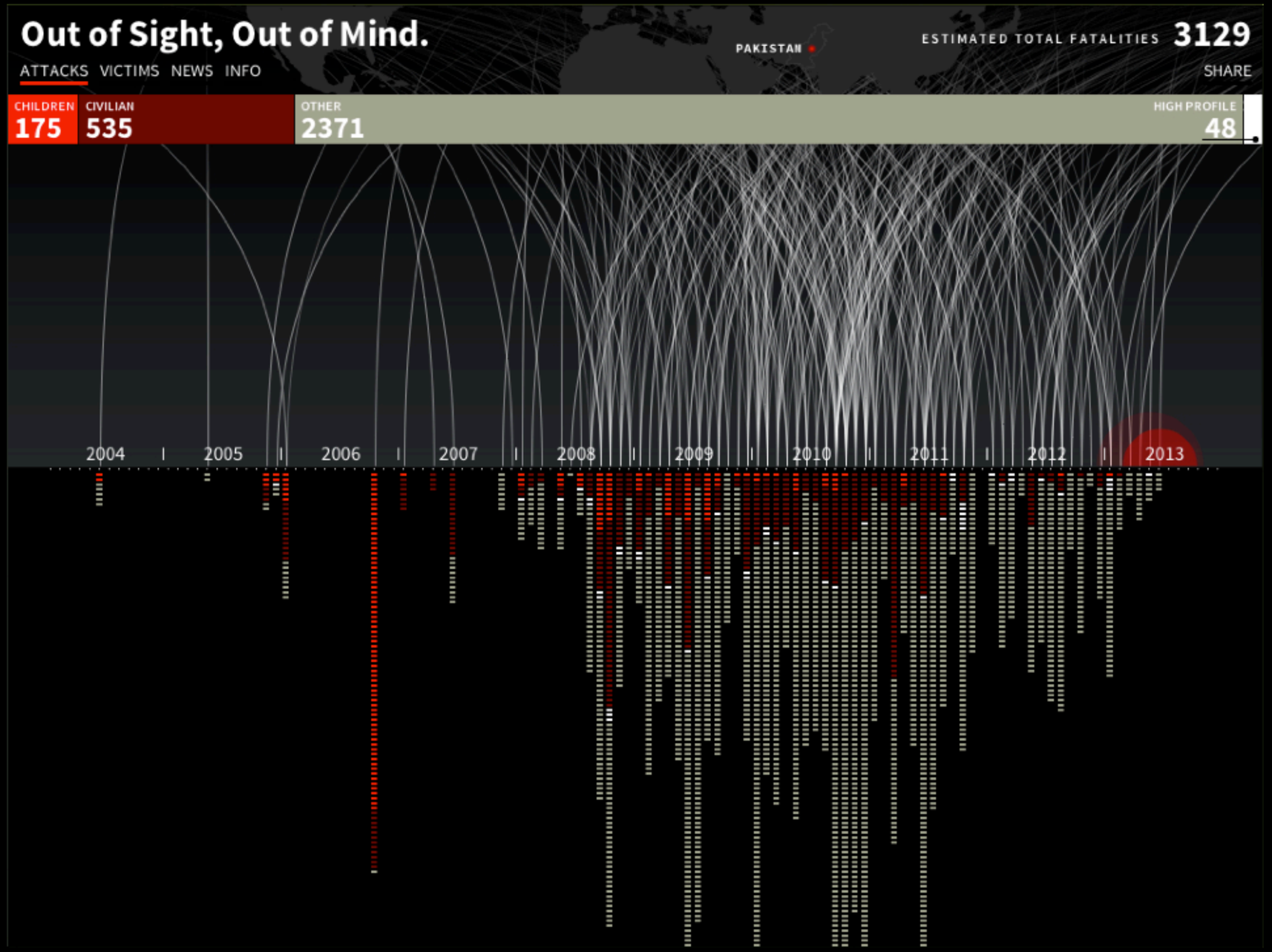


New York Times: The Yield Curve

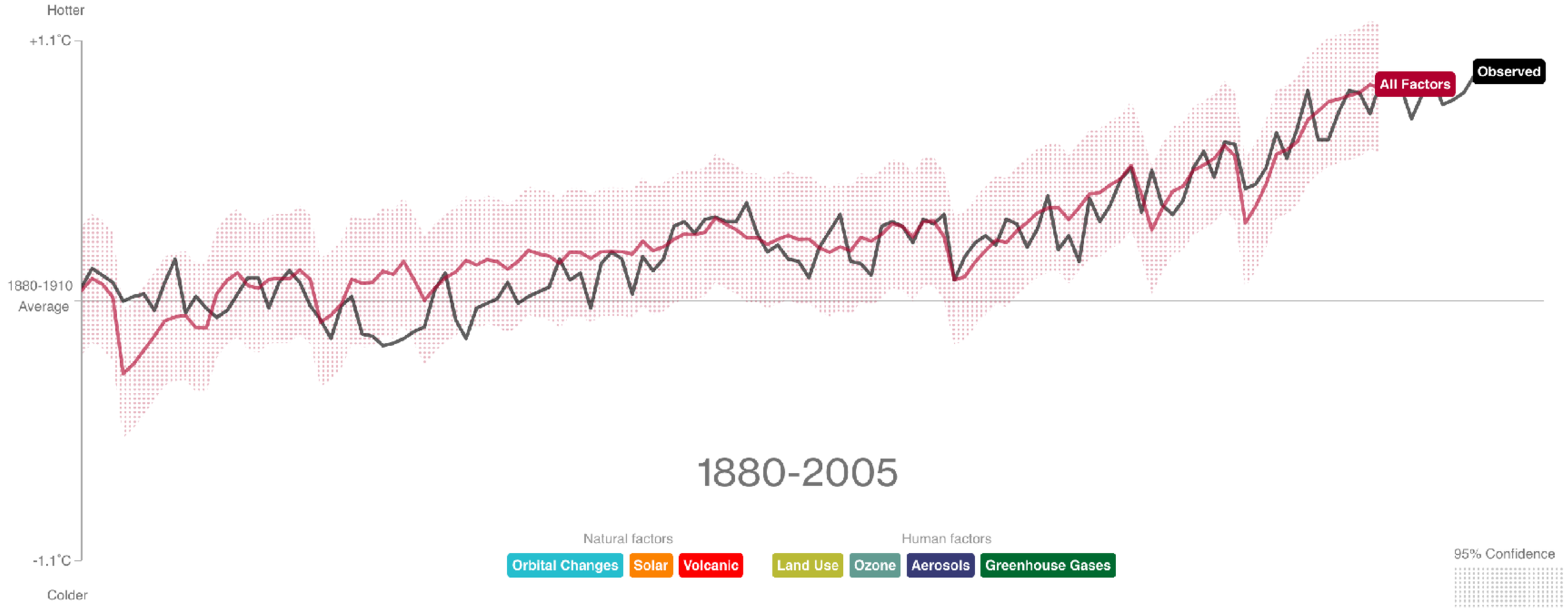
Animation as …

- Attribute
- Representation
- Transition
- Introduction

Periscopic: Guns



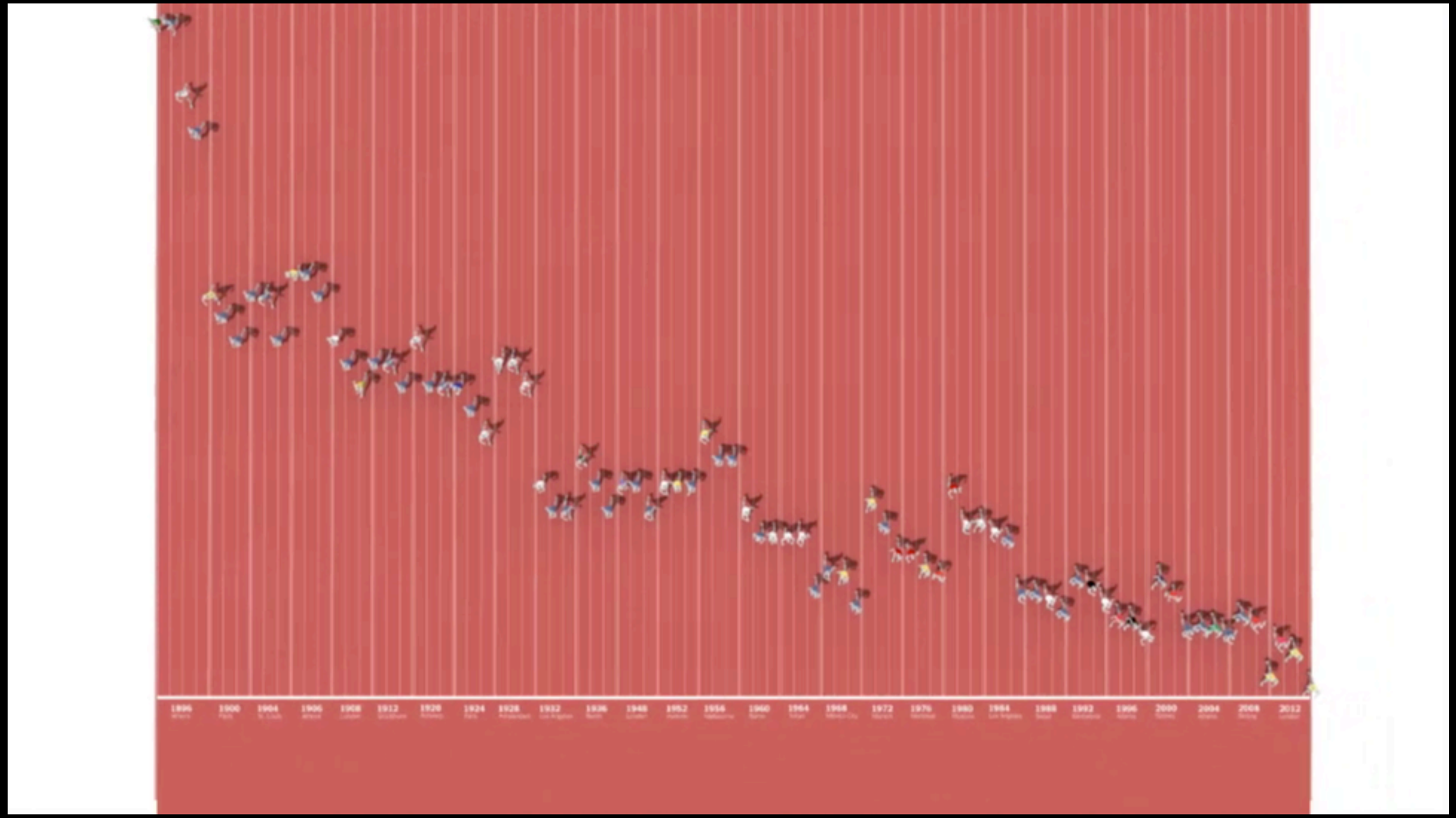
Pitch Interactive: Drones



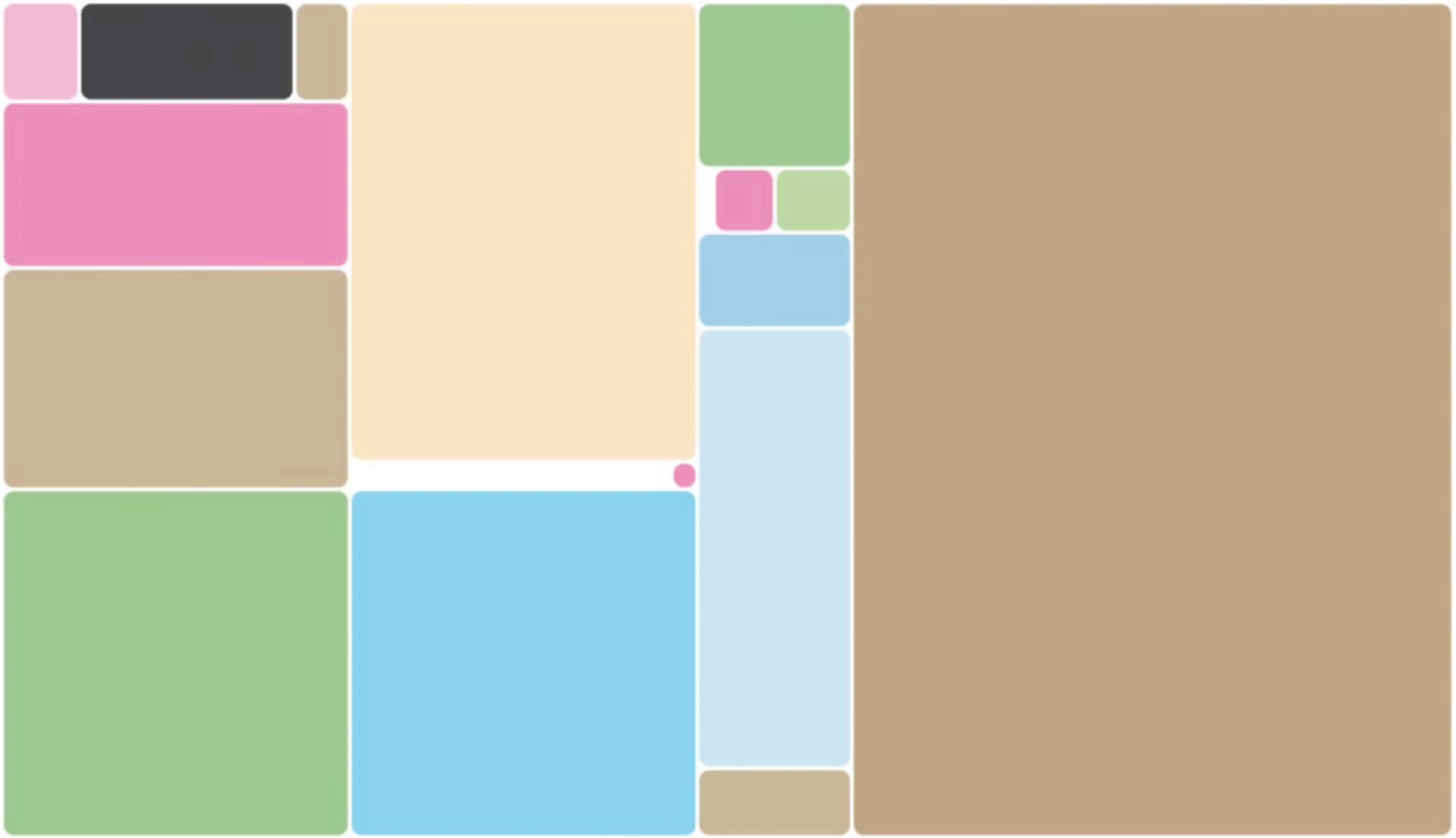
Bloomberg Businessweek: What's Really Warming the World?

Animation as …

- Attribute
- Representation
- Transition
- Introduction
- Narration



The New York Times: One Race, Every Medalist Ever



David McCandless, Debtris

Many Thanks!

Don’t hesitate to get in touch.

Benjamin Wiederkehr
benjamin@interactivethings.com
+41 76 533 33 72

Interactive Things
hello@interactivethings.com