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# TNM048 - Information Visualization

# Laboration 1

## Task 1

### Super Bowl Ad Time (2014)

#### Overview

The site gives an overview of the ads played during the football event super bowl. Additional info as to what ads where played, when during the event they were played, the total time distribution of said ads and what category the ads where pertaining. Figure 1 below shows the site in its entirety.

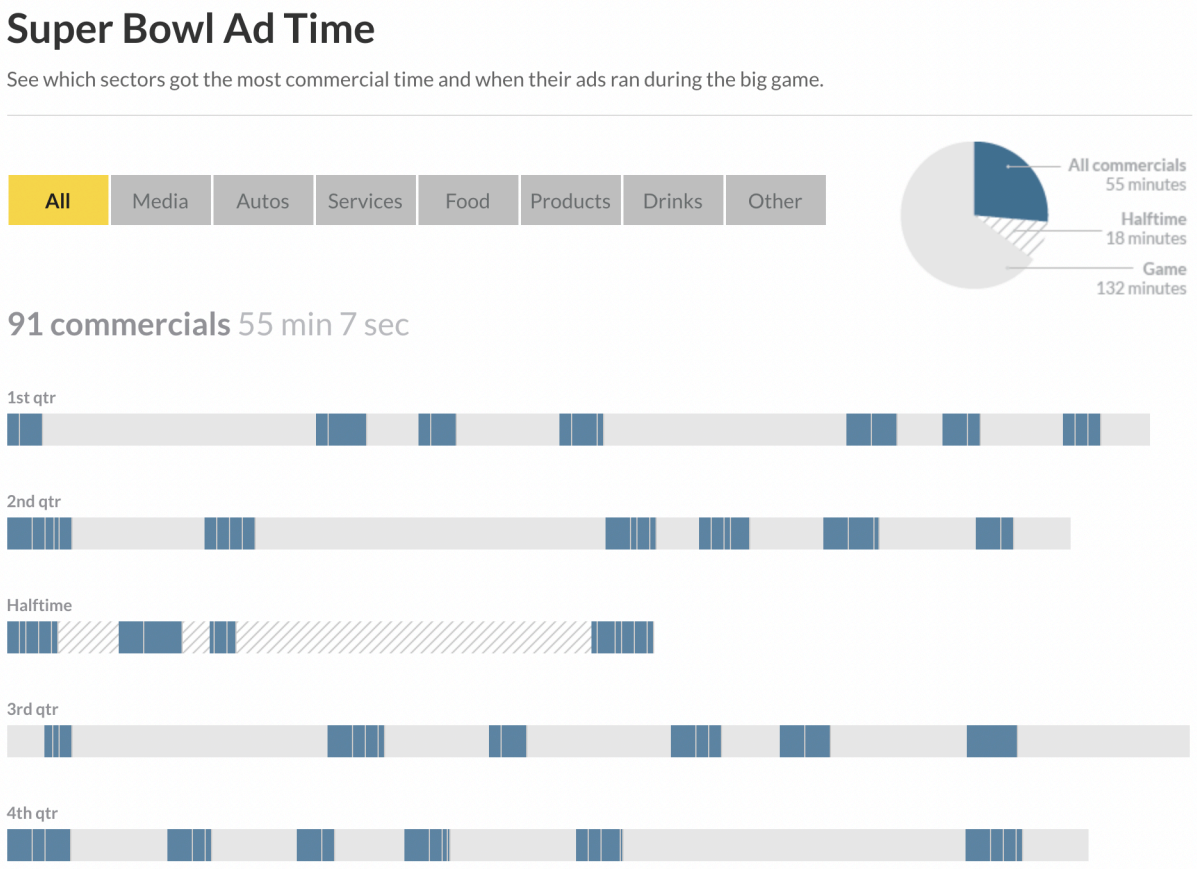


Figure 1: Overview of the contents of the site *Super Bowl Ad Time*

The ad time is mainly represented on this site using a sort of horizontal *stacked bar graph* where each ad is displayed as a portion of the bar graph. The bar graphs is further segmented as five bars where each bar represents a portion of the entire event. The five graphs represent the quarters played in a football match along with the super bowl halftime show. Hovering over the portions highlighted in blue shows what was advertised as well as the duration of the ad. This is show in figure 2.

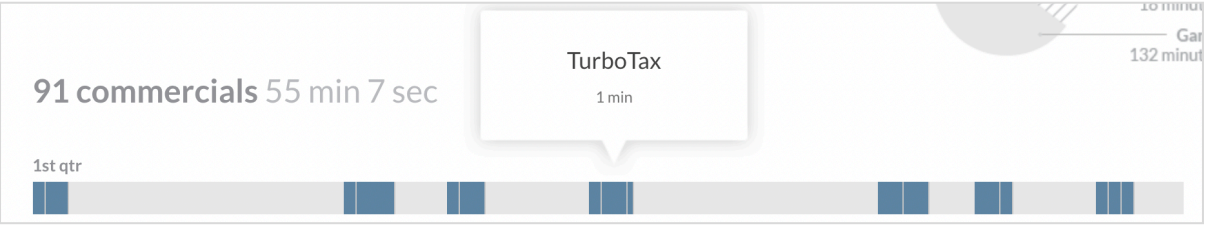


Figure 2: One of the five horizontal bar graphs which shows a highlighted ad by having the mouse hovered over it

Further, as the ads are also categorised into what they were advertising there is the option to filter the ads to highlight those particular ads. Figure 3 below illustrates how the automobile ads are distinguished from the other ads. This distinktion is achieved by slightly saturating the blue colour of the segment which represented the ad. The other ads which did not belong to the category is also lowered in saturation to a very faint grey with blue tones. The ability to get the particular advertiser of the desaturated ad, as was shown in figure 2, is also removed. This partitioning is achieved by pressing one of the buttons above the bar graphs or by pressing an ad of that category. The current category is highlighted with a yellow colour to show which category is currently displayed.


Figure 3: One of the five horizontal bar graphs with all of the automobile adds highlighted

The total time distribution of the ads is also shown on the site using a *pie chart.* The pie chart shows the distribution along with exakt time of each of the three categories accounted for; *All commercials*, *Halftime*, *Game*.

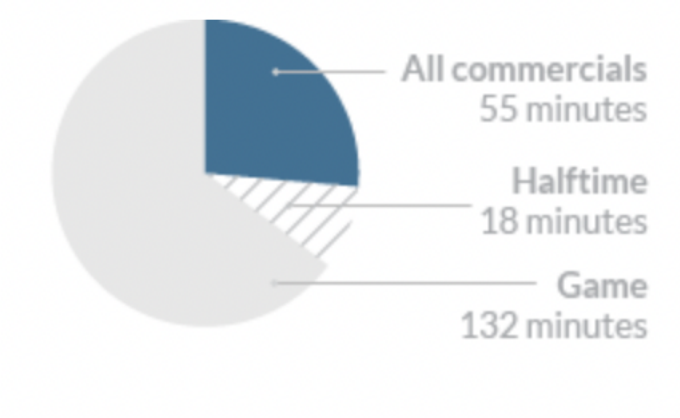


Figure 4: Pie graph displaying the time distribution of all commercials played, the halftime show and the actual game time

The colours and patterns used in the pie chart are concurrent with the ones used within the stacked bar graph; A light grey, Indigo and white with stripes.

**Discussion**

The initial impression of the site was very positive as it was very easily digestible. The purpose of the site as well as the information presented was very well conveyed. The choice to use *stacked bar graphs* seems to be well motivated too. It is natural to display a timeline as a horizontal line where time progresses from left to right, as is common praxis. The order of also follows common reading patterns, upper left to bottom right. The choice to partition the bars into the four quarters of game time as well as the halftime show makes the ads more eligible. As they are presented currently, they can be of proportionate size in regards to the bar size. Having, for arguments sake, a single bar would diminish a lot of the current designs benefits, such as the proportionate size and the ability to fit it comfortably on the screens dimensions. Additionally, the bold and large text along with the contrasting colouring increases the accessibility for visually impaired. Overall, well organised for what it tries to visualise.

# EU Referendum (2016)

### Overview

This site aims to visualise the United Kingdoms voting on the referendum wether to leave or remain in the European Union using *maps* and *graphs*. Figure 5, shown below, are examples of maps used on the site. The maps shows what percentage of people voted to leave (left), what percentage voted to remain (center) and what the turnout (right) was for each of the areas represented. This type of map depiction could be considered a type of *heat map*.

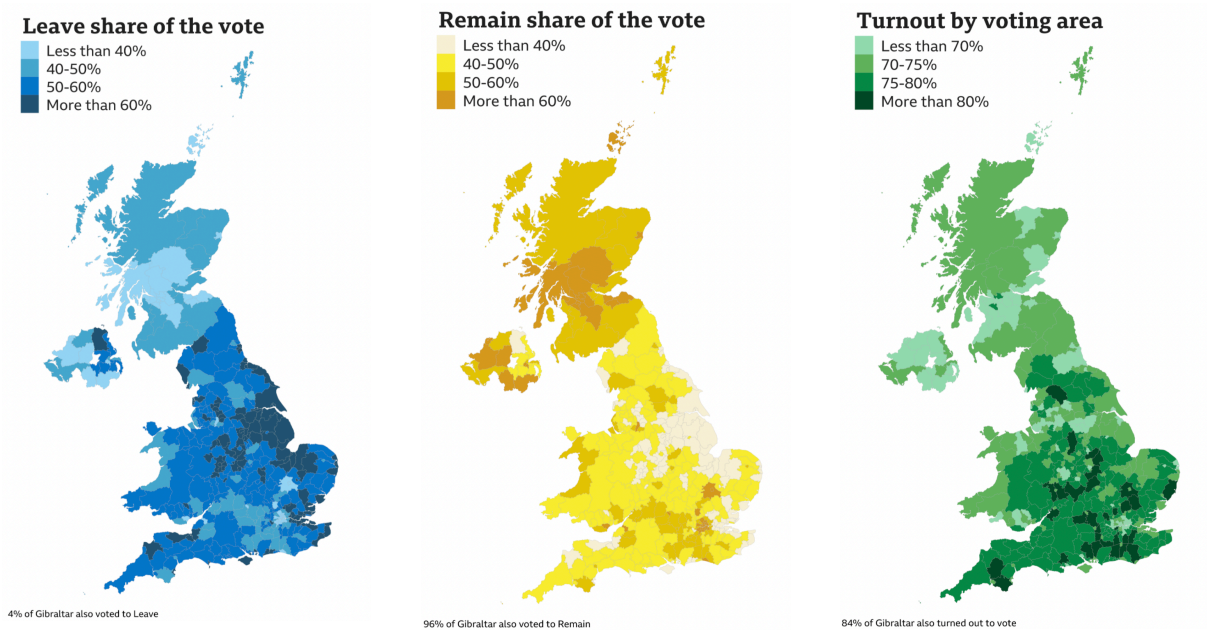


Figure 5: Maps depicting percentage of people voted to leave (left), remain (center) and turnout (right) in areas of the United Kingdom

Additionally the site also used *percentage bar graphs* to show the percentage distribution for several interesting datapoints. Some examples of datapoints were the five areas were support to remain and support to leave were the greatest as well as how different age groups voted and voter turnout. An example of a *percentage bar graph* used on the site can be seen below in figure 6. Another example which is shown in figure 7 uses the depth of the bar in addition to show the quantity of voters in the depicted area.

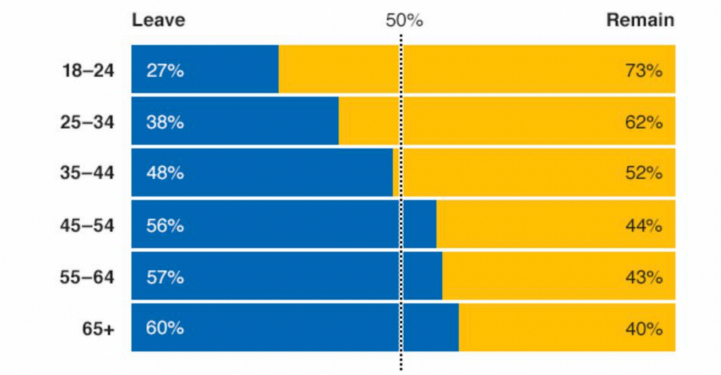


Figure 6: Percentage bar graph depicting how different age groups voted. The bars show the ages and the percentage for each choice with a reference line to show which choice was in the majority

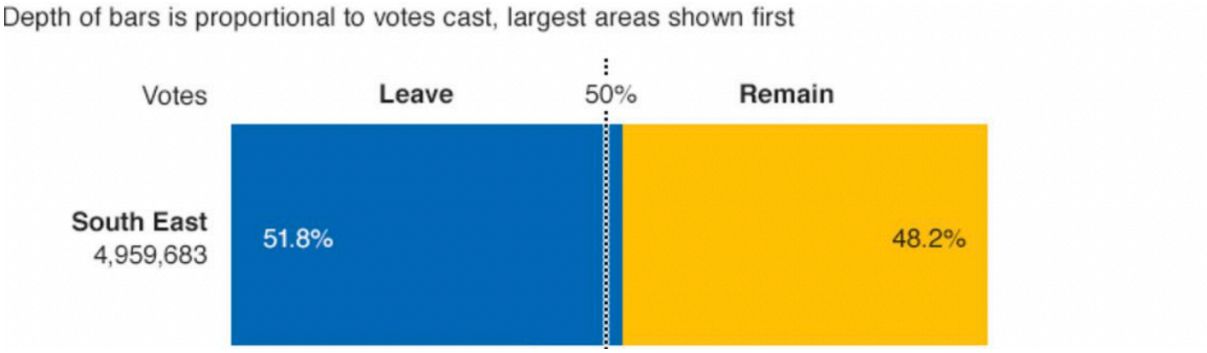


Figure 7: Percentage bar graph depicting what that area voted for using depth of the bar to show the amount of people that voted in that area

The site also uses these different types of visualization methods in tandem to compare the results of a similar voting held in 1975 wether the United Kingdom should stay or leave the European community. This is shown below in figure 8.

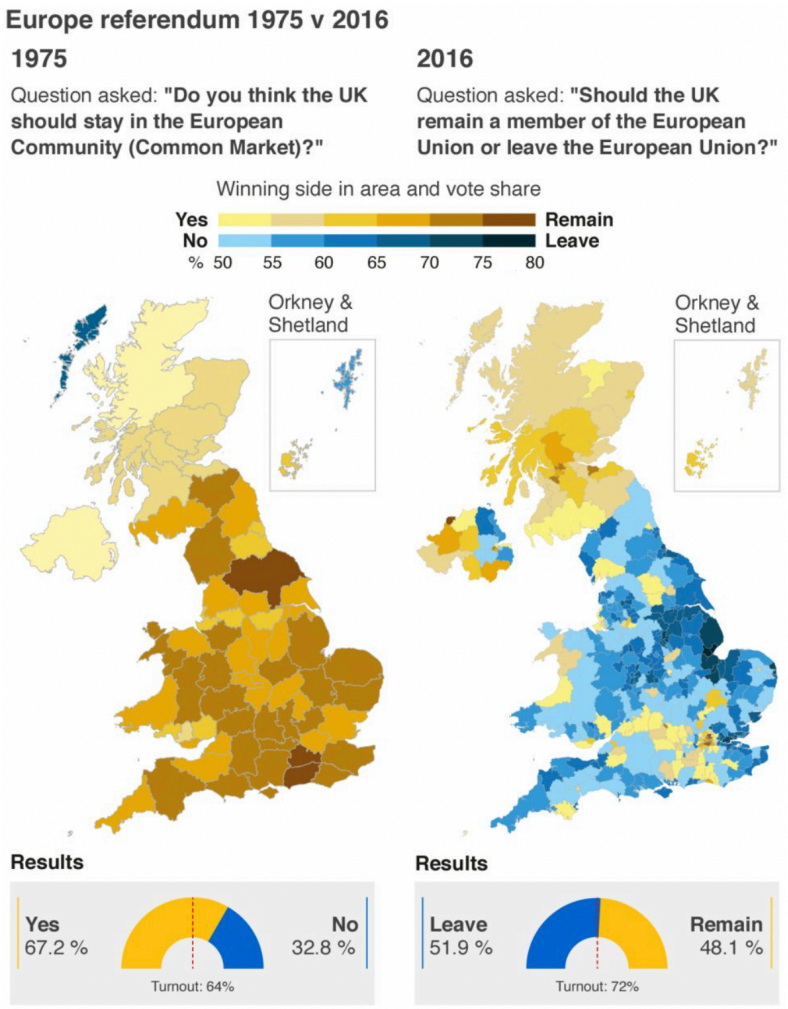


Figure 8: Results of two different votings held wether the United Kingdom should stay or leave the European community (later referred to as European Union)

To display the final results a map showed the color for the vote that the majority of that area voted with a numerical result for the referendum in the top left corner. There was also a full list of every voting area sorted in order of most votes to leave in a similar structure to what is used in figure 6. The full list cover nearly 400 voting areas. Notably, none of the visualizations used on this site were intractable in any way as they were all static images.

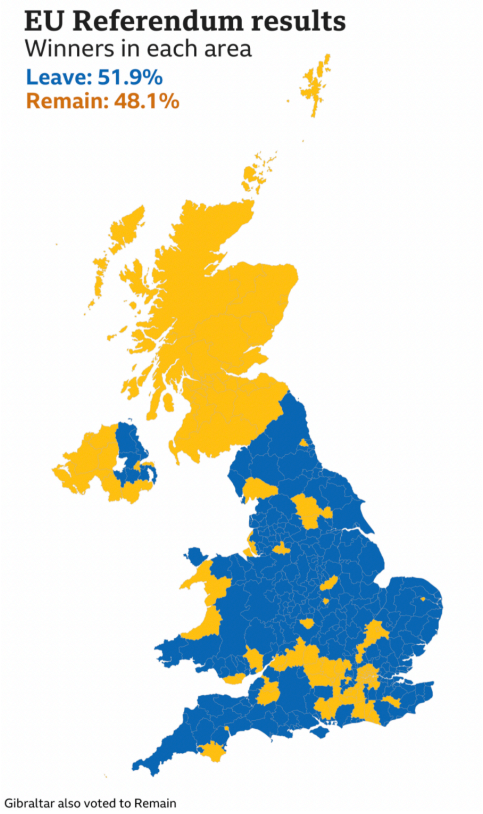


Figure 9: Final results of the referendum held wether the United Kingdom should stay or leave the European Union

**Discussion**

As stated in the overview the site uses both a *map* based approach to visualise data as well as *percentage bar graphs*. For the type of data trying to be presented the choice seems very apt.

Introductory, in the map based visualisations two leftmost maps in figure 5 depicted the turnout for each voting option as the inverse of each other, one blue and one yellow. These colors are consistent over the site for the same voting choice, vote to leave was consistently blue and the vote to stay was consistently yellow. This consistency makes it easy to follow as you explore the results presented on the page. The site also presents the same voting data interestingly with different purposes, voting in contrast to age, population of the specific area as well as voter turnout by age group. The maps give a great overview of the results but lack the ability to give a detail insight for a specifik data point. Also, as it is presented there is no way, without prior knowledge of the geography, to somehow link the data of the map to an area. This could be fixed with a numbered list or some sort of function were the name and statistic of that area were to be displayed upon interaction. Notably, most of the images were somewhat blurry and of lacking quality. Overall, the choices of data visualization seems appropriate but the map based visualisation lacks the ability to gain detail insight.

# US Presidential Election (2016)

## Overview

The website is supposed to visualise how votes were distributed between the democratic party and the republican party due to the election in 2016. The charts represents information from the electoral votes and how they are disrupted. The distribution of all the changes in senators and numbers of representatives are also visualised.

Pros:

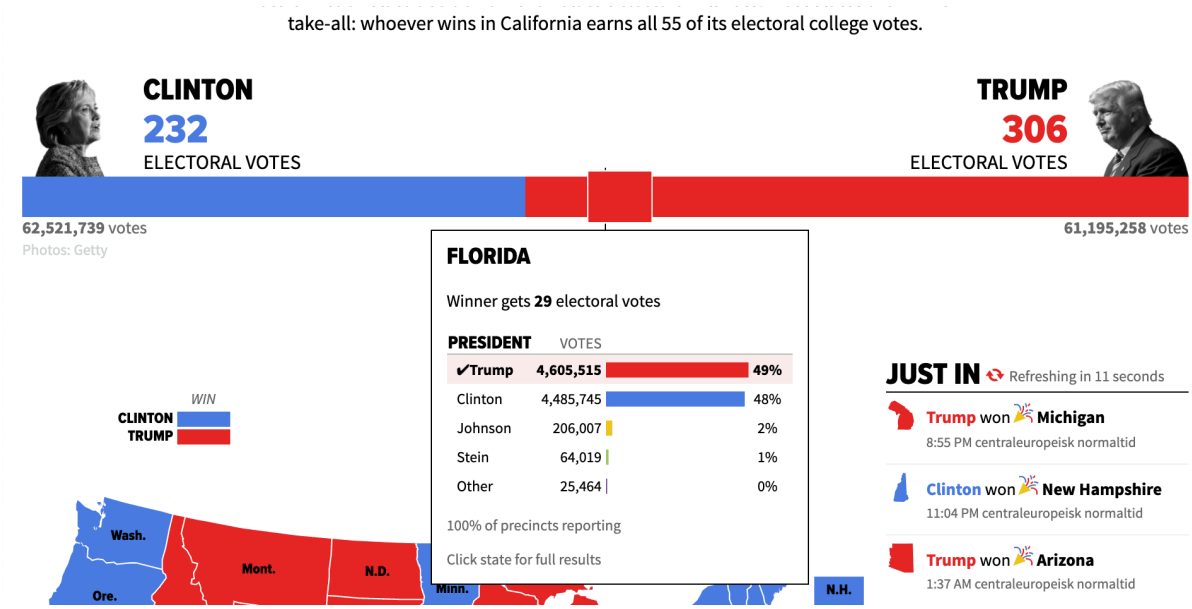


Figure 10: Displaying how states makes up electoral votes on a bar chart

The graph in Figure 10 depicts how the number of electoral votes count towards each party winning. By hovering over the chart each states number of electoral votes can be visualised and represented. Each states number of electoral votes are visualised on  a map as well. All reported results from each state can be found be hovering and displays what percentage of votes that were taken into account. More info on each state can be found be hovering over them as well. How the electoral votes makes up the bar when hovering is very clear.

Cons:

The number of votes cast on Clinton in Figure 10 represent more individual votes than what Trump received. Due to the political rules of the states deciding the

president this is correct but can mislead the observer, as a higher number of votes otherwise would suggest ”more electoral votes” on the charts.

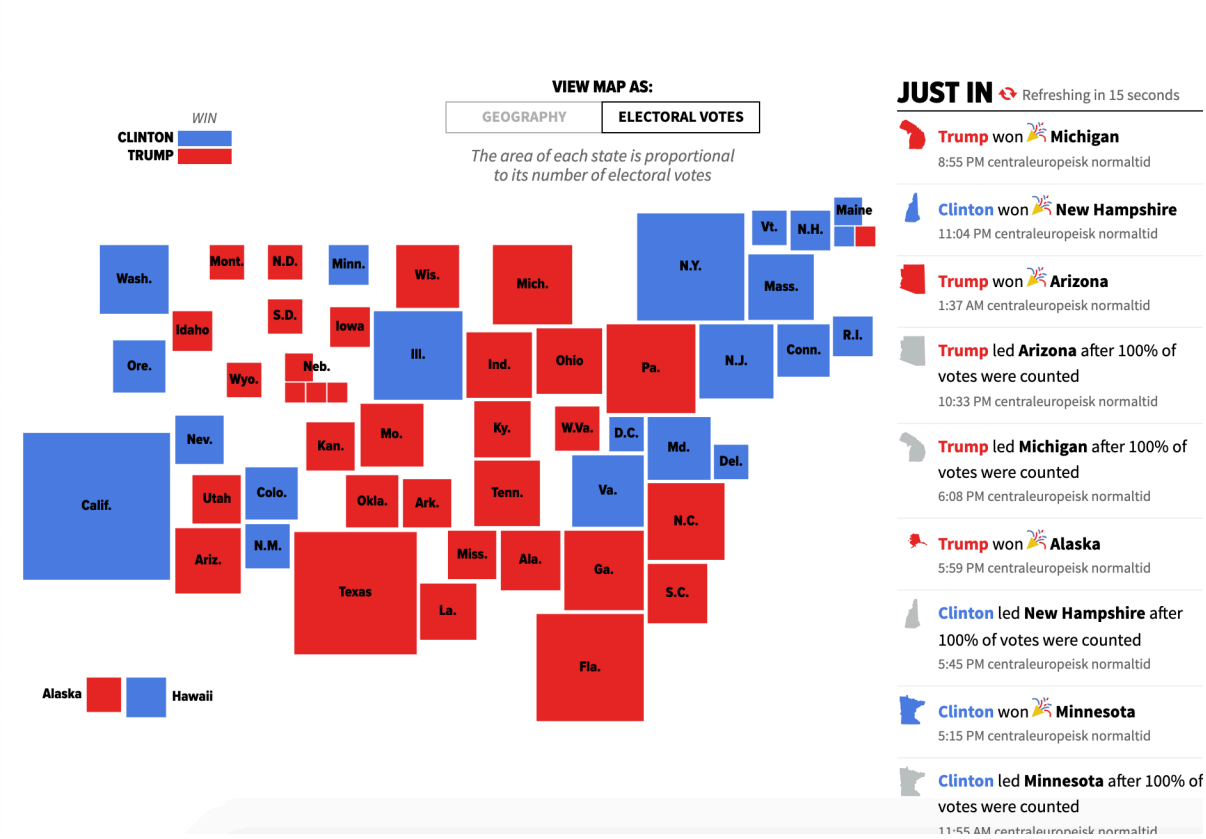


Figure 11: Displaying all states and their corresponding amount of electoral votes for winning based on the population of the state

Each states number of electoral votes are displayed as squares with different size formed around the map of United State. This does showcase the number of electoral votes but gets messy which all of them depicted with no scale beside them.

Discussion:
The information displayed in the graphs showcases all states number of votes and updates it by the counting of the votes of the election. All timestamps are given for the count of the votes, as also how the electoral votes changed the result of senate as well as the house of representatives. For someone which lack of knowledge of how the vote American voting system works, it clearly displays how the votes are distributed and change accordingly. It does however not give much insight and customisation for seeing how a combination of states voted or enable to change what the result would be if some states are left out and whose had a bigger impact as some states were very divided between candidates. The idea of customising data would suggest how the information could be looked more into otherwise than the result that was displayed. A setting to show the result of states during the

counting of the votes would also visualise how the information was presented and changed over time as it now only displays when a specific state won.

# Free and Occupied Beds for Covid-19 Patients in Germany (2020)

## Overview

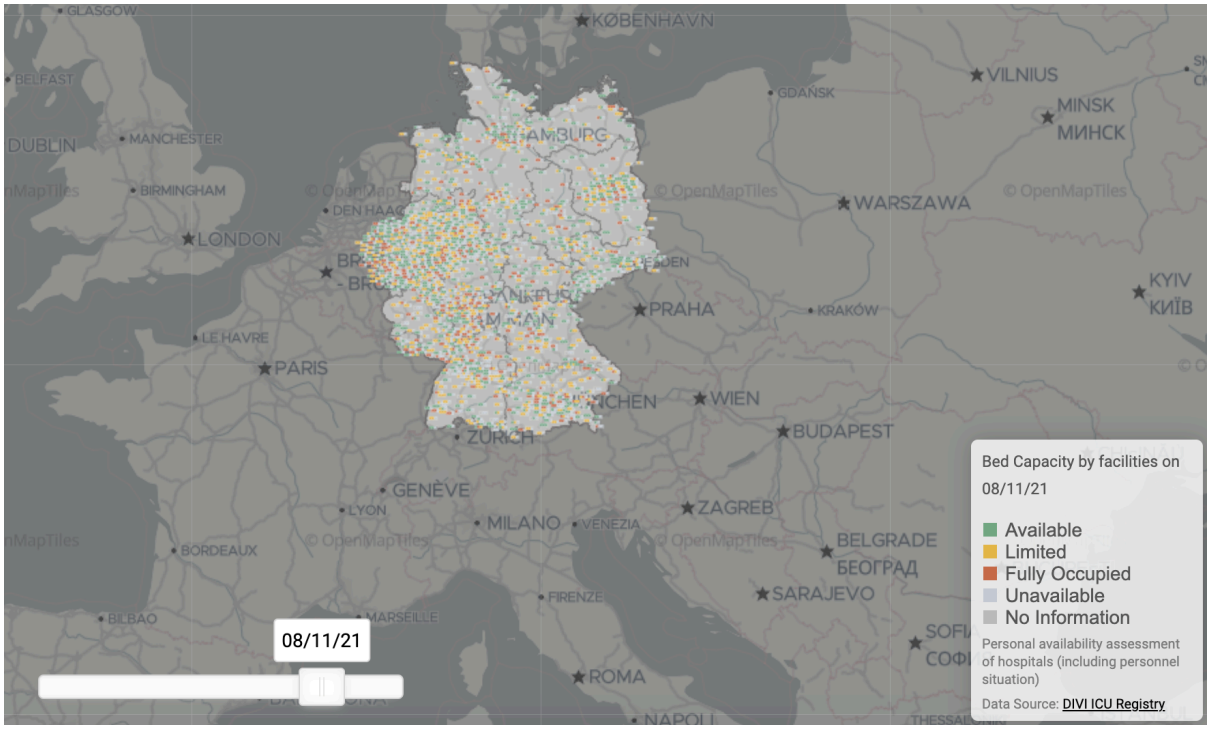


Figure 12: A map displaying the bed capacity in Germany with each facility in the shape of a rectangle.

The website displays a map of which hospital beds are occupied and not during the time-period from 10/1/2020 to today (23/1/2022) in all cities of Germany. The main implication of the visualisation is to display how the coronavirus was affecting Hospital capacity to treat patients and to what extend hospital have available, limited or fully occupied beds to treat their patients. Each rectangle is supposed to display each facility. Each facility ”box” displays the status of the ICU low, ICU high and ECMO to treat different patients as displayed in Figure 13.

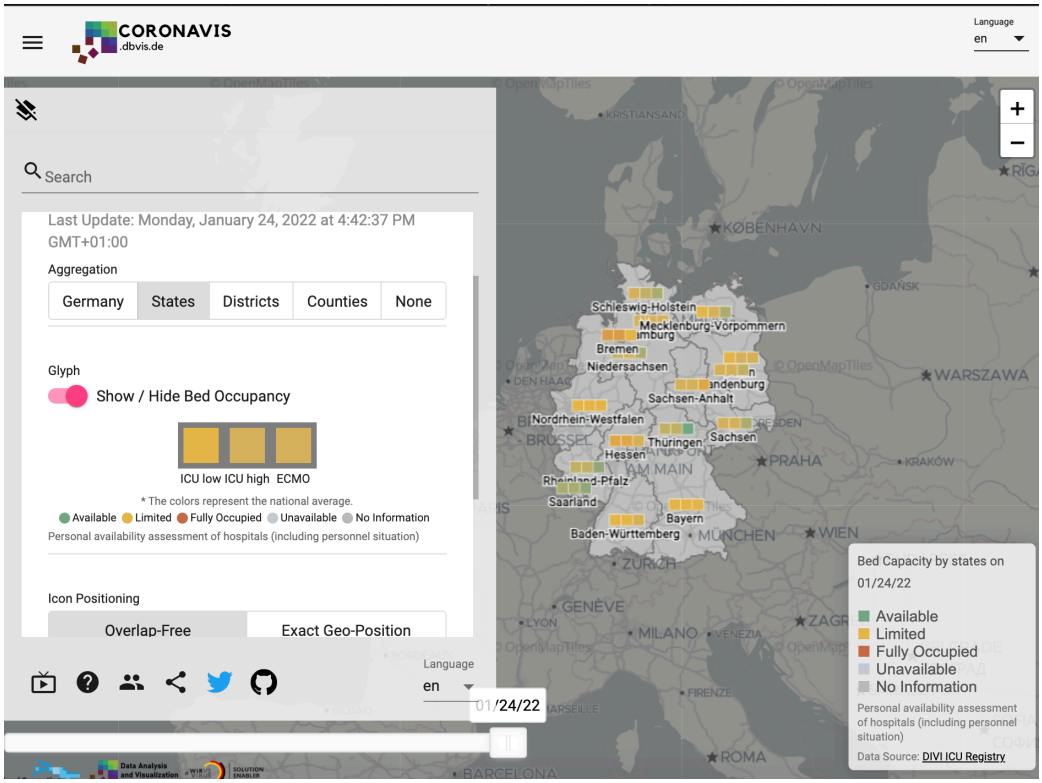


Figure 13: Filtering between states, districts, counties and all the facilities.

The map of the hospital bed capacity can filter between the whole country, states, districts, counties or none, to display all facilities as seen in Figure 13. Each one displaying the overall status in boxes.

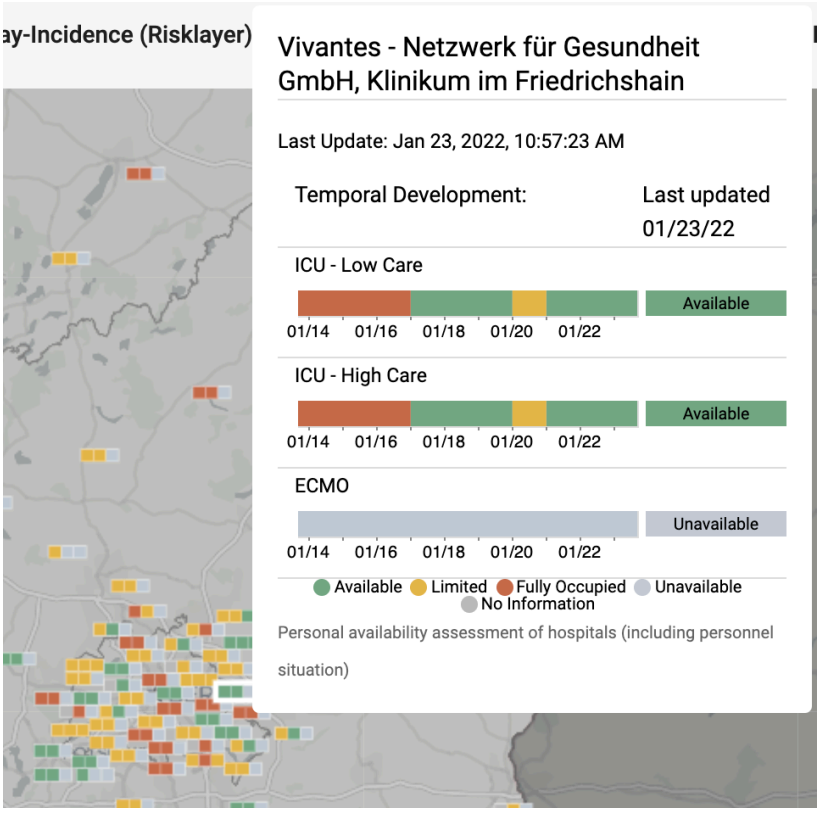


Figure 14: The status of facility during the last seven days.

When zoomed in on a separate facility, with filtering set to none, the facility will display the availability of beds in each facility in the ICU high and low care, ECMO services during the last seven days as seen in Figure 14.

## Pros:

By displaying data over a time period as seen in Figure 14, and what the situation looks like now is great to discover patterns of how different facilities are operating and how what extend the service is needed. By filtering between states, counties and facilities its also gets more clear as how most states are operating as a full.

## Cons:

The rectangles are somewhat hard to read and can sometimes be very misleading which can be shown in Figure 15. Here it displays that there is limited amount of beds available since the majority of facilities do. It doesn't display clearly that there are facilities with low and high care open available clearly in green. Another color then a mix of yellow and green would be a better choice.

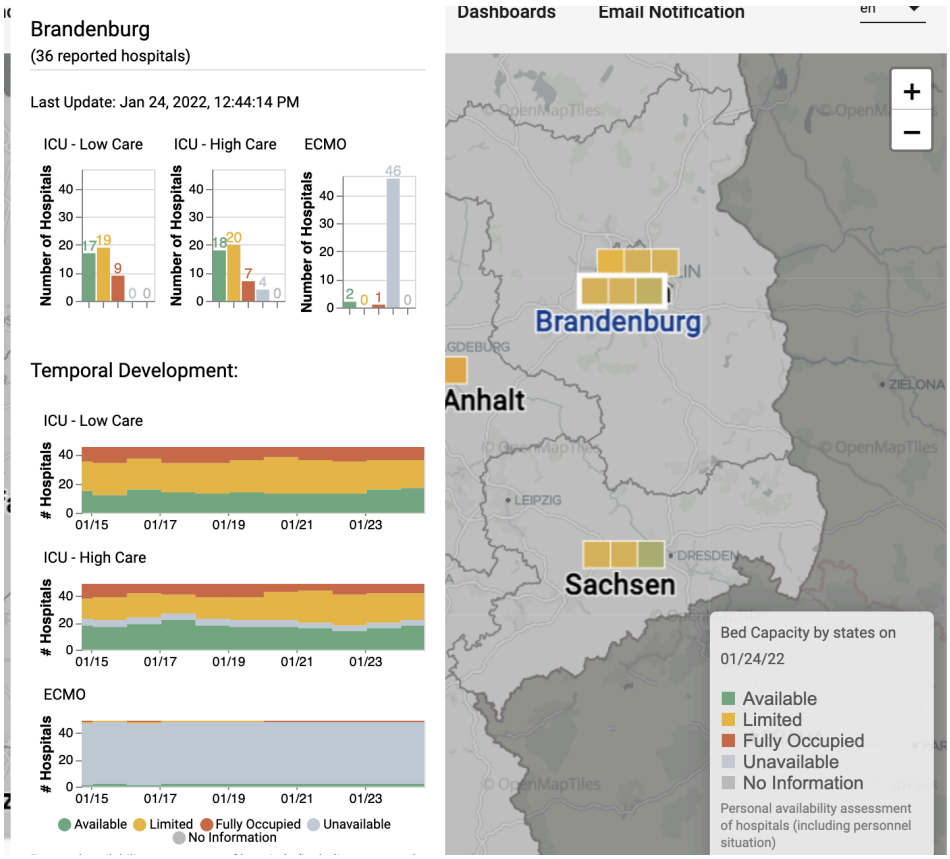


Figure 15: Displaying overall status in the state of Brandenburg

The third box displaying ECMO doesn't represent much useful data as most of the information there is unavailable and displays as limited. Due to there being a lack of color difference, it can become misleading to what extent it can operate.

## Discussion:

The bars used in which the hospitals capacity in the different departments displays can be very confusing and displays information very poorly as there is not a good indication of color combinations. There are mainly three: green, yellow and red. An extension of colors would be more helpful and don't blend in to each other as much. As most facilities are yellow it would be more interesting to visualise the data which is not shown and can throw the observer off. A solution would be to visualise the states with circle diagram or bars which can be filled in.

# Task 2 - Good and bad visual design

## The good: Selfiecity - The Selfiexploratory

[http://selfiecity.net/selfiexploratory/]

The Selfiexploratory is an information visualization site which visualises selfies based on several factors. Setting some parameters such as demographics, pose, facial features or mood a selection of the dataset is presented. The entire visualization and its interface is shown in figure 16. The entire dataset of 3840 is displayed on the sites lower half and all of its interface is displayed on the sites upper half.

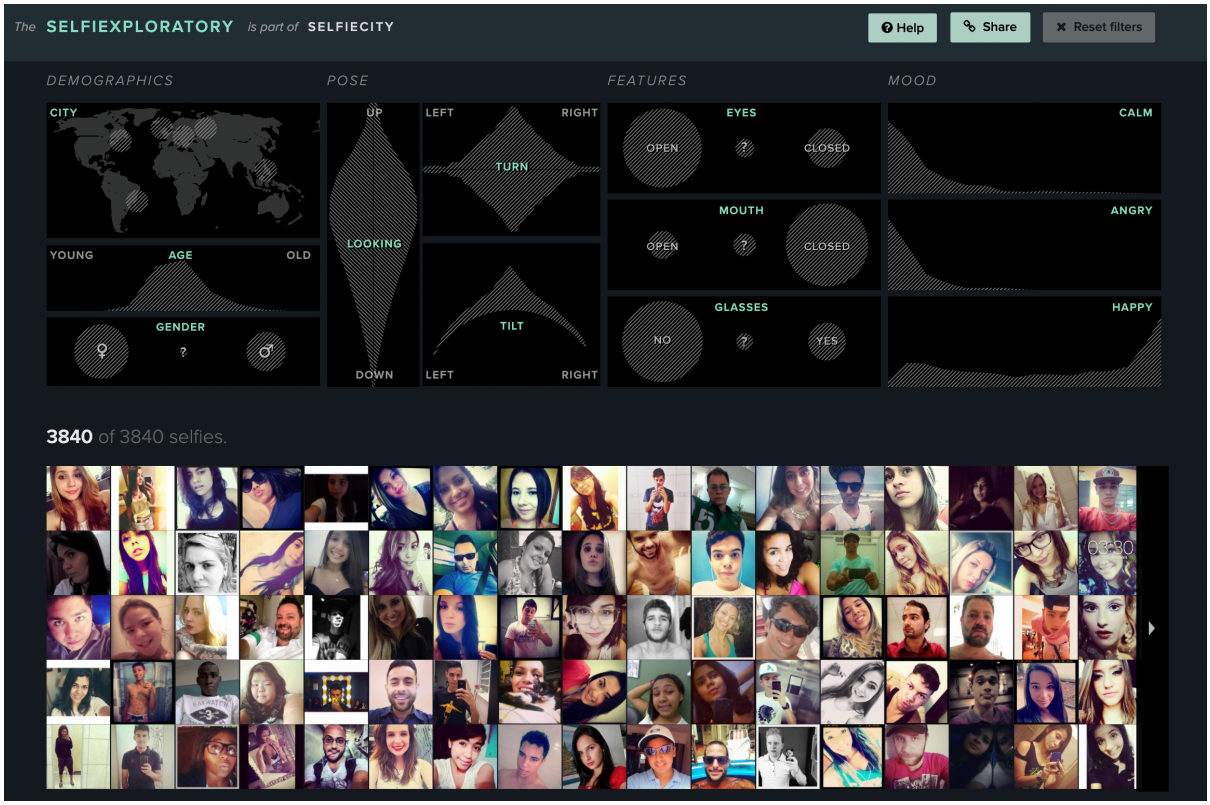


Figure 16: The site Selfiexploratory which displays its dataset, distribution and interface

The way to filter the dataset is by using interface on the upper part of the screen. The distribution of all of the parameters are also shown within the interface of the dataset. Take for instance the distribution of the pose of the head in the selfies. Shown to the right in figure 17 is the interface to filter by the pose of the head which also shows the distribution of the heads pose by three parameters; Looking up or down, head turned left or right and head tilted left or right. By examining the distribution you can tell by a glance that most people are looking slightly upwards, turned straight forward and have their head levelled. The data can then be filtered by clicking on the distribution.

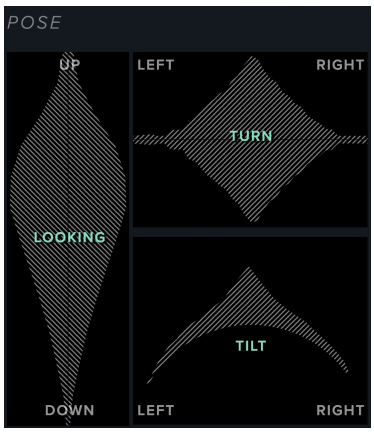


Figure 17: Distribution of head poses

By interacting with the distribution the user can filter the dataset. An example of how the dataset can be filtered is shown in figure 18 below as well as how the rest of the distribution is affected by the filtering.

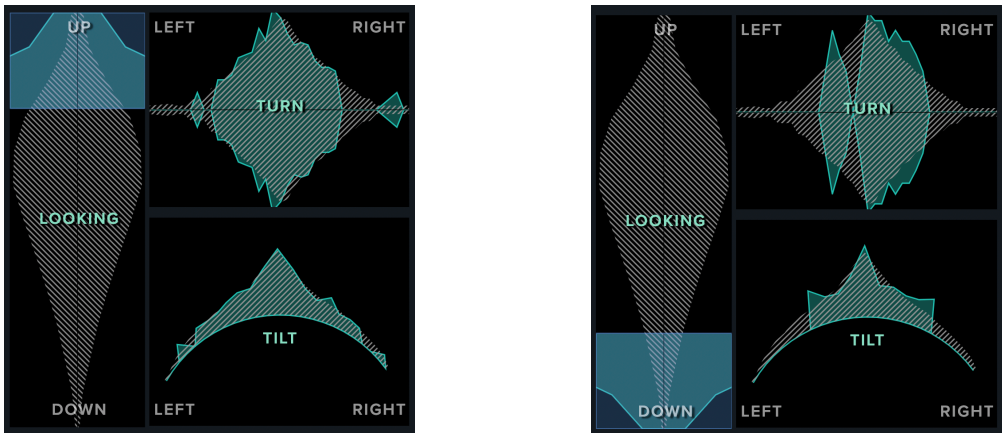


Figure 18: Filtering applied to the distribution (blue) and how the filtering affects the dataset (green). Filtering of people looking up (left), filtering of people looking down (right)

The filtering can be moved as to contain a greater span of selfies by sliding the upper and lower span of the blue band. This filtering can be applied to every parameter in the interface to show a great or very precise selection of selfies. The resulting collection of selfies in the dataset that fit the parameters of the filtering is then shown in the lower part of the screen. All filtering can then, if wished, be removed by pressing a reset button in the upper right corner.

Overall, the site combines several sort of information visualisation with a well made interface. The site uses *curve distributions, proportional area charts* to represent both gender and distribution on a map and filters its data using a band-pass filter. All of the choices of information visualisation are very well suited for the end goal of filtering selfies by the given parameters and is executed well. This is a good example of information visualisation because it intuitively shows both the data and gives great means to explore and filter the data in a transparent manner.

# The bad - The Economist: Why ticket prices on long-haul flights have plummeted

https://www.economist.com/graphic-detail/2018/12/08/why-ticket-prices-on-long-haul-flights-have-plummeted

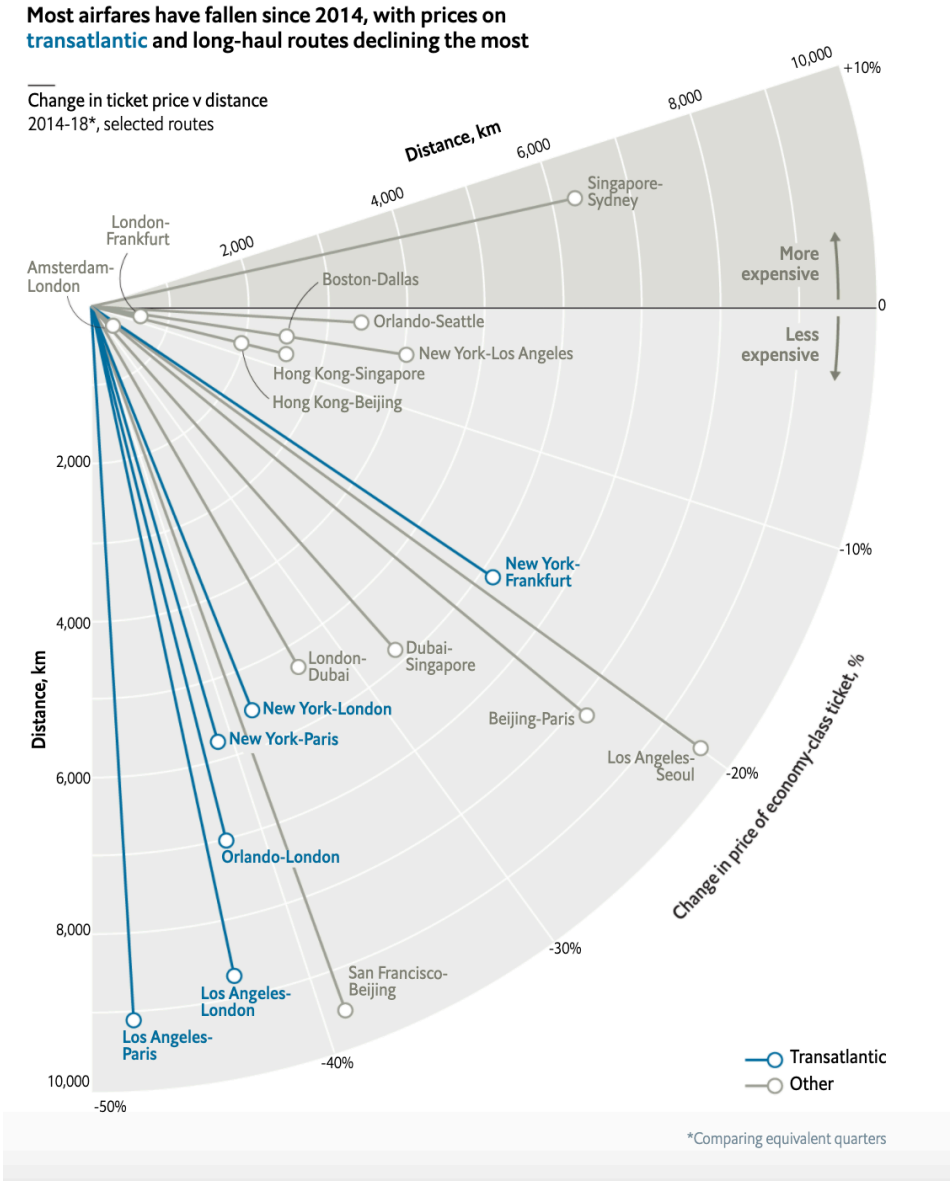


Figure 19: Depicting change in cost of economy class tickets for different trips based in kilometers.

## Overview:

The graph in Figure 19 depicts the difference in how prices have changed since 2014, meant to show how longer flights have decreased in price while shorter travels and other other popular traveling destinations have changed accordingly. The chart displays an axis with the distance (km) and change in price of economy class tickets. What gets unclear when reading the chart is that the lengthier flights gets clearly visualised while the shorter are difficult to see what percentage they represent (Amsterdam- London, London- Frankfurt for example). The prices for the flights are not depicted either which doesn't inform the observer how much the flights actually have changed in price. When the prices aren't included, the difference between how much a short flight costs and a long flight can cost can become very misleading as the amount in percentage can change very rapidly depending on the original cost.