Visualizing People's Happiness during the Covid-19 Pandemic with Twitter Data

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The Covid-19 pandemic has deeply affected everyday life: countries have shut down, closed their borders and enforced movement and gathering restrictions. Social interaction has been put to a minimum, and people's happiness has been affected. This map shows the tweets during the pandemic, between November 2020 and January 2021, to see how people's happiness is distributed over time in the study area in the unit map in the form of a hexagon.

RELATED WORK

Some researchers have done a similar visualization of hexagon map and method of fetching social media data. But this project will focus in the specific topic about Covid-19 with Twitter data from Bavaria and its surroundings as the study area. Here are the previous studies:

In [1] the author used the geotagged Twitter data from central Tokyo to analyze the pattern hourly and daily. The acquisition method he used is obtaining data with Twitter API. And the visualizations he used are data aggregation, graph drawing and animation drawing.

In [2] the authors obtained the emotions words from Twitter and counted it for each tweet and replies. Afterwards, they calculated all of them to generate a recommendation. The novelty of this research is that they used agreement score, sentiment score and emotion score. In the final result, they visualized the data to the network graph between positive, negative and neutral.

In [3] the authors fetched the geo-data from Flickr to build models from 2005 until 2016. The visualization is a heat map. There are 3 models based on the length of the route that is taken by Flickr users. In the end, they show the density for Beijing tourist attractions.

Finally, in [4] the author did the research for Java by obtaining geolocated tweets and visualized it into spatial point analysis i.e. quadrat density-hexagon, quadrat density-square and point density.

IMPLEMENTATION

Covid-19 has become an important global issue lately but a similar project with this topic in Bavaria has not been found before. So, this project will visualize people's happiness in Bavaria during Covid-19 pandemic.

In the Figure 2 the workflow of the project is presented. We first fetched the data from the Twitter API, where its strong limitations forced us to space out the queries over the span of two months.

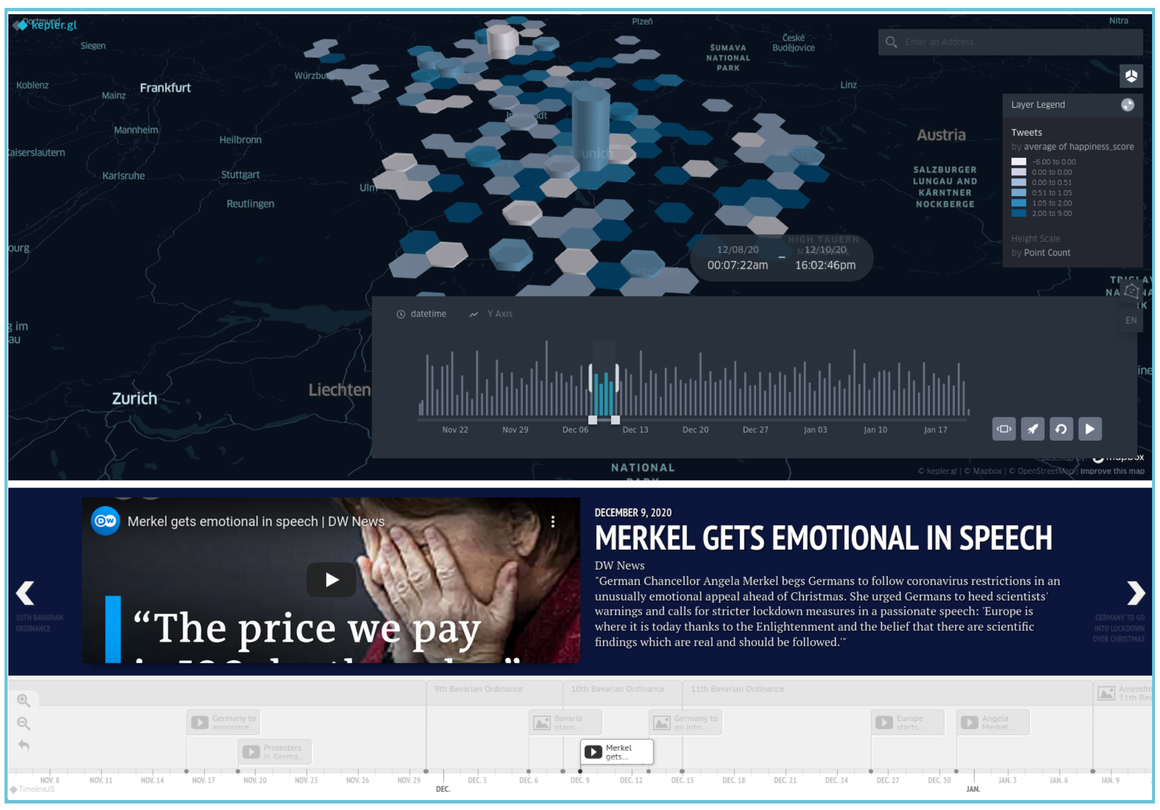

Figure 1. Screenshot of the project website

Later, the tweets get processed using Python, extracting the date, location and text. The text gets matched against the Afinn dataset [5], resulting in a happiness score for each tweet.

The visualization of the data in a dynamic map is realized with kepler.gl, a powerful JavaScript library for spatial analysis. Another innovation of the project is to represent the data in hexagonal tessellation, with a time selector. We chose a hexagonal tessellation as the final visualization to mitigate problems related to the tweets position, as most, but not all, of them have a single location for every city. So because of the data and study area we have, hexagon gives us this advantage to use as an aggregation unit.

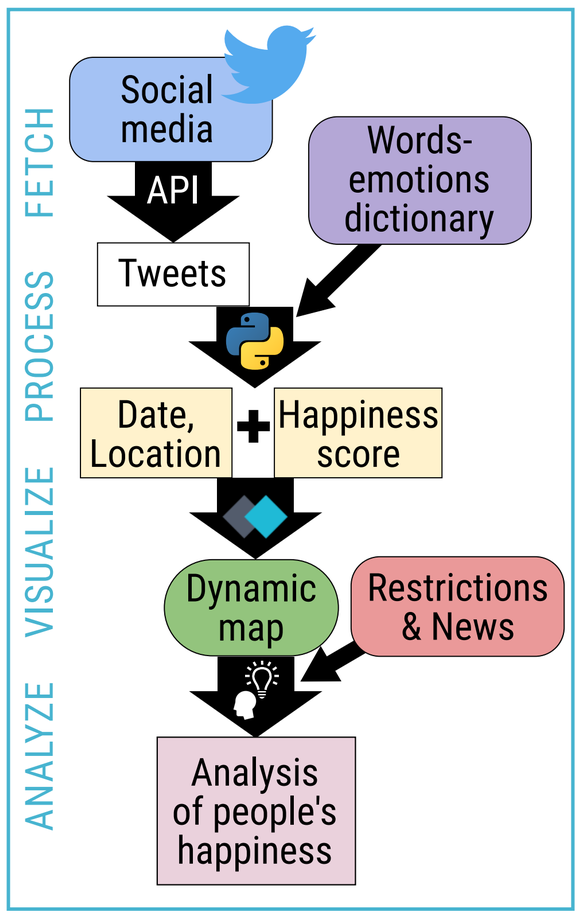

Figure 2. Workflow

The website is complemented with a timeline made with Timeline JS, where the most relevant regulations and news, related to the current pandemic, are covered. With that, the users will have all the required information to analyze and interpret the map.

CONCLUSION

From the data visualized in this project, it can be seen that people's happiness changed over time during the pandemic, especially when the restriction is updated.

Some news affected how people react in Twitter. For instance, people feel happy when the drinking ban in public was lifted and people get sad when Germany announced its intentions to go into lockdown over Christmas.

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LINK

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