Visualization

Winter Semester 2025/2026

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Programming 2 - Countries and Bubbles

1 Introduction

In the last exercise we have loaded the data and have drawn a sphere with a graticule on top. This time, we will draw the country boundaries and the bubbles representing the number of dead and missing migrants. For this exercise we will reduce the details we give for the various implementations. So you might have to research how certain things work on your own or come to the exercises and ask the TAs for help.

Task 1: Countries (2 Pts)

The countries consist of two parts. The first is the outline of the land masses which will be filled in according to the styling information at the top of the file. The second part is the interiors which will be drawn to indicate borders between two countries. Both parts will be implemented in the *Countries* component. You will find a number of TODOs in the files (mostly the file *static_content.js*). Don't forget to add the new component to the *App* component which wires everything together!

Task 2: Bubbles (2 Pts)

Now, we are adding the first visualization technique from the lecture. A scatter plot with dots scaled according to the number of missing and dead migrants. The location will be given by the coordinates of the incident. With this a viewer will see where the incidents usually happen and get a feeling for the severity of the incident. The bubbles will be implemented in the *Bubbles* component. One of the first things we need is a size scale that tells us how to map the number from the data set to the radius of the circle. Think about which kind of scale is appropriate for this task. The area of the circle should be proportional to the number from the data set. Next, we have to map each entry in the data set to a circle. Make sure to pass the coordinates through the projection before adding them as the coordinates of the circle. You will find a number of ToDos that will guide you through the process. Don't forget to add your new component to the *App* component and in your *index.html* file you have to add the *bubbles.js* just like *app.js*, *static_content.js* and *data_loading.js* are added.

Task 3: Bonus: Update the data (1.0 Pts)

This is an optional task that you can do to score one bonus point. The data we are using in this course does not include data from 2020-2025. The missing migrants project, where the data is downloaded from, also offers data for these years. In this task you should update the data. To do so you have to download the data containing the recent years from the official website of the Missing Migrants Project. Next, you have to process the data using Excel or similar software to only include the necessary columns. Then, you can host it on Github Gist (or keep it local) and replace the necessary lines of code in your visualization. As this is an optional task we won't provide any further guidance than this.

Missing Migrants across the Globe

Description
This visualization shows the number of dead and missing migrants across the globe. The data consists of 6056 rows and 3 columns. The data is visualized and can be explored using two connected views. The first view shows a world map which contains bubbles placed at the location of the incident. The bubbles are scaled by the number of migrants that went missing. The second view contains a bar chart which shows the number of missing migrants for each month. The bar chart allows the user to select time spans which should be shown on the map. This enables an interactive exploration of the data. By default all incidents are shown.
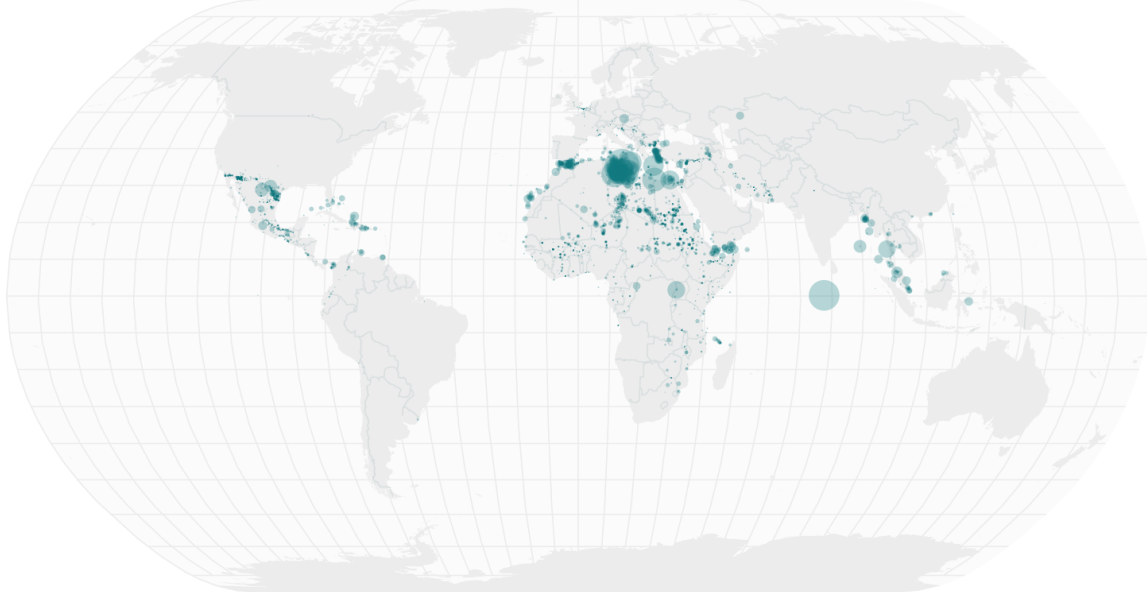

Fig. 1: Solution to this exercise: After drawing the land mass, we draw inner country boundaries on top. Lastly, cities are visualized as circles, with the number of missing migrants being mapped to the circular area.