

Data Visualization
Team 'Anything'
Anush Anand - 2021101086
Mitansh Kayathwal - 2021101026
Vineeth Bhat - 2021101103

Link to video

[Data-Viz-Team-Anything](#)

Introduction

We are analysing and visualising the impact of natural disasters and other data related to it. Such events have caused severe devastation worldwide and inflicted significant harm to life on earth. Our aim is to examine the geographic distribution and economic ramifications of natural disasters. Studying these phenomena is vital for multiple reasons, including future incident mitigation, preparedness, and response.

We believe that data visualisation for natural disasters could yield substantial benefits. By providing a comprehensive solution, people can make informed decisions during emergencies. Visualisation aids in identifying trends and patterns within the data, ultimately aiding in the development of sound disaster management and prevention strategies.

Through our visualisations, we try to capture the underlying trends in data like which countries are likely to be more disaster prone, along with their economic impacts like their effect on a country's GDP, number of people rendered homeless etc. A user using our visualisation would get a detailed idea about the impact of Natural Disasters across the world and the damage inflicted by them.

Visualisation Principles

1. Abstraction
Our data contains abstraction in the form of attributes such as disaster type, human impacts, economic impacts, regions and so on as described in the introductory submission.
2. Tasks
Tasks have been abstracted into action and targets as performing actions such as relevant searches, analysis and queries on a restricted number of attributes.
3. Marks
Marks have been used for visual encoding with appropriate channels defining their appearances. Most of the marks used have been used as a mathematical view with their dimensions relating to numeric values (magnitude channels) with some just to define different data points (identity channels).

4. Idioms (Tables)

Relevant idioms have been used such as Mercator maps, spider charts, word maps, circular packings, sunburst charts and so on.

5. Colours

Categorical colours have been used in most visualisations to denote different classes of attributes not directly being visualised. Ordered colours have also been used to show relative magnitudes.

6. Interaction

Tooltips have been added at relevant spaces. Further interaction capabilities will be added in due course.

The visualisation principles have been elaborated on further in the following explanation.

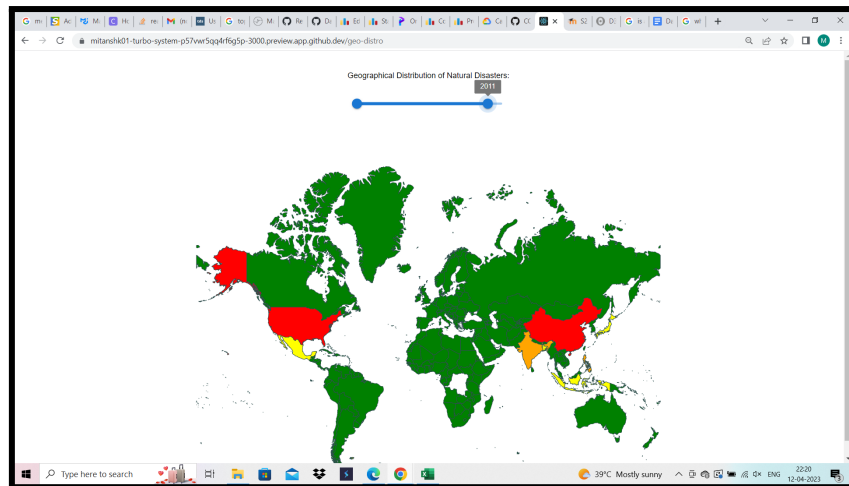
Visualisations

1. Mercator Map of the World -

A Mercator map of the world has been presented to visualise the distribution of Natural Disasters across the globe. This has been done for a time period which the user selects. The user does so using a 2 thumb slider, the gap of which represents the period being visualised. This increases user interactivity. The mercator map is zoomable and can also be translated from left to right or vice-versa.

Different Colours have been used to depict the average number of natural disasters happening in a country. (In case data has not been available for a particular country during a given period then that has been represented as "White" colour on the map). The colour "Green" represents that a country is less disaster prone and then the colours "Yellow", "Orange" and "Red" depicting the disaster prone countries in increasing order of the country being disaster-prone.

A tool-tip is available on hovering a country which gives information on the Country Name and the number of Disasters which have happened during that period. The reason behind doing this visualisation is to give the user a complete idea about the areas which were more disaster prone and thus make informed decisions about moving to a particular region.



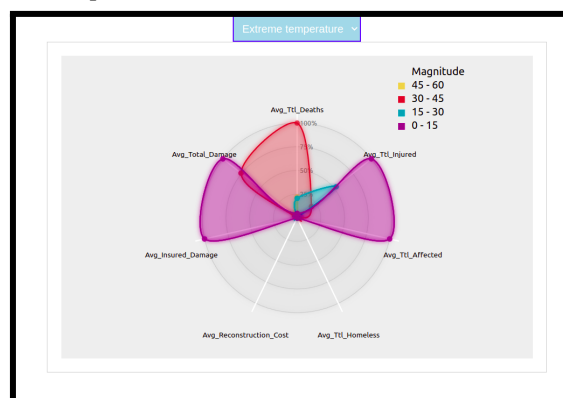
2. Spider Chart -

The reasoning behind this visualisation is to provide a clear and concise representation of the relationship between the magnitude of damage caused by a disaster and its impact on both human lives (number of homeless or injured people or number of deaths) and the economy (reconstruction costs and insured damage on economy).

By dividing the magnitude scale into four parts and assigning a specific colour to each, the visualisation allows viewers to quickly and easily understand the severity of the disaster and its impact on both the human and economic aspects of society.

In terms of visualisation principles, the use of colour to represent the severity of the disaster is an effective technique as it allows viewers to quickly and easily understand the severity of the disaster.

The visualisation is a spider chart or radar chart. This type of chart displays multivariate data in the form of a two-dimensional chart with a series of axes emanating from a central point.

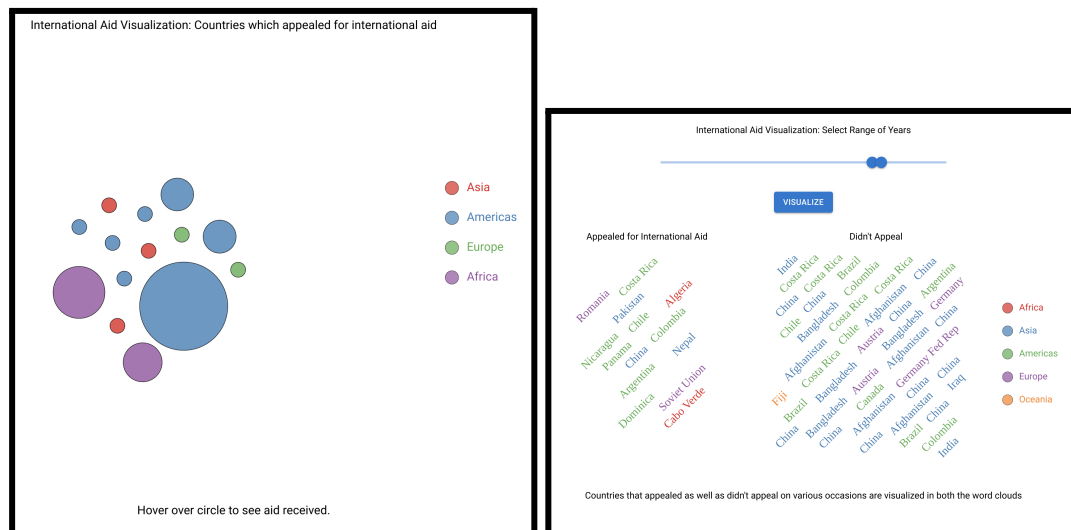


3. Word Map leading to Circular Packing chart -

Geopolitics and dependance on the international community can be inferred by visualising whether a country asked for international aid and how much aid it received.

The first visualisation shows two different word maps of countries that appealed for international aid and those that did not after a disaster. The user is provided with a slider to decide the range of years to check for the countries. On clicking the countries that have appealed for international aid, we open another visualisation - a circular packing chart with the size of the colours denoting how much aid was received as well as recorded.

The marks used in the word map are just texts showing the name of the countries with the colour being the same for countries in different continents. The marks used in the following circular packing are non-overlapping circles with appropriate sizes. On hovering over a country's circle, we can see the total aid received.



4. Sunburst chart -

Disasters often lead to several other associated disasters. For example, an earthquake often leads to tsunamis and droughts lead to famines. Exploring such data is important to be better prepared for all disasters.

We propose making a sunburst chart with the centre as the main sectors with the further disasters stemming out of them. Clicking on a sector will make it expand into the particular disaster, with the stemming disasters being visualised properly.

5. Line Chart -

We plot a line chart against magnitude and year when disaster happened for each data point we colour it red if emergency is declared and we colour it blue if emergency is not declared. This helps us visualise if an emergency is declared if disaster has more magnitude.

6. Parallel set

We have data on disaster group (Ex: natural), disaster subgroup (Ex: climatological) and disaster type (Ex: earthquake). Each attribute will expand into its constituent types. This will also help us visualise the percentage of disasters that belong to a particular type within a subgroup and later a group.

Project Contribution

1. Anush Anand - Worked on spider chart
2. Mitansh Kayathwal - Worked on Mercator Map of the World
3. Vineeth Bhat - Worked on Word Map leading to Circular Packing chart