



Information Visualization

Investigating Climate Change



Research Questions

- What is the evolution of climate change and effective variables on Earth?
- What pairs of these variables are correlated in this regard over time?
- What regions are most affecting and most affected over time?



Goal of the Visualization

- **Visual exploration of historical climate and human-related data variables**
- Pairwise comparison of variables
- High-level and detailed representations
- Dynamic, linked, and integrated
- Bidimensional exploration



Data Dimensions

- Geographical Dimension
 - Region name
- Temporal Dimension
 - Year of given measurement
- Value Dimension
 - Value of measurement for given variable

The screenshot displays a web application with the following components:

- Header:** Browser tabs for "Group Project", "Information Visualization - Gr", and "React App". The address bar shows "localhost:3000".
- Left Panel:**
 - Russia:** A text input field containing the word "Russia".
 - CO2 Emission (per person):** A bar chart showing emissions per person over time, with a color scale from 0.02 to 8.08.
 - CO2 Emission (total):** A bar chart showing total emissions over time, with a color scale from 0 to 2,500,000.
- World Map:** A map of the world showing CO2 emissions by country. Russia is highlighted in dark red, indicating high emissions. Other countries like the US and Canada are also highlighted in red.
- Line Chart:** A line chart showing CO2 emissions (per person and total) from 1850 to 2014. The x-axis represents years from 1850 to 2014. The left y-axis represents CO2 Emission (per person) from 0 to 15. The right y-axis represents CO2 Emission (total) from 0 to 2,500,000. The chart shows a significant increase in emissions starting around 1900, peaking around 1990, and then declining.



Motivation of Design

- Choropleth Map: geographical
 - Time-series Plot: temporal
 - Parallel Bar Chart: ordinal
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- Time Range Slider: temporal selection
 - Dataset Selector: variable selection



Visualization Insights

- High-level and detailed view of dataset can be inspected simultaneously
- Distribution of dataset can be seen both geographically and in the bar chart
- Country comparison enabled through brushing and linking
- Time slider scrubbing shows dynamic changes in distribution over time
- Dataset selection allows many different pairs