CS416 Narrative Visualization Project Essay

Name: Rohit Mukherjee | Project URL: https://rohitmukherjee.github.io/ | Email: rohitm5@illinois.edu

---

Live: URL: https://rohitmukherjee.github.io/
Repository: https://github.com/rohitmukherjee/rohitmukherjee.github.io

Message:

The message I'm trying to communicate throughout this essay is that workers in poorer countries have lower earnings per hour not due to an absence of work ethic, but due to their *circumstances* and lack of *opportunities*.

This message is communicated through **5 scenes**, examining the total annual hours worked per country, correlated with their GDP per capita and their labour productivity rate.

Some guiding points are provided in every scene (in addition to a chart) to explain the chart better. The audience is encouraged to interact with the charts through tooltips, annotations and parameters. In the final scene, the message is reinforced by an explanation alongside a choropleth (with tooltips).

Narrative Structure:

The narrative structure used in my project is that of an **Interactive Slideshow**. There are 5 scenes (slides, in this case) with Next/Previous controls for the user to control the flow.

However, the user can interact with each slide by hovering/clicking (slides 2 and 3) or even through parameters (selecting a country on slide 3). On slide 5, the user can interact with a Choropleth through tooltips and also select a country from the dropdown to see an explanation about the country's situation.

Visual Structure:

- Each scene has the following visual structure:
    - A title explaining the objectives of the scene.
    - A list of bullet points containing explanatory information.
    - Some guidance to the user about navigating the chart.
    - A chart displaying the data. I've used several different chart types such as scatter plots, a line chart and a Choropleth.
- The consistent visual structure helps the user easily navigate the slideshow and understand the content on each slide.
- There are Previous/Next buttons at the bottom of each scene that allows the user transition to the next scene.
- The only scene that is slightly different from the other scenes is the first one. This scene is meant to provide an introduction and therefore doesn't contain any charts.

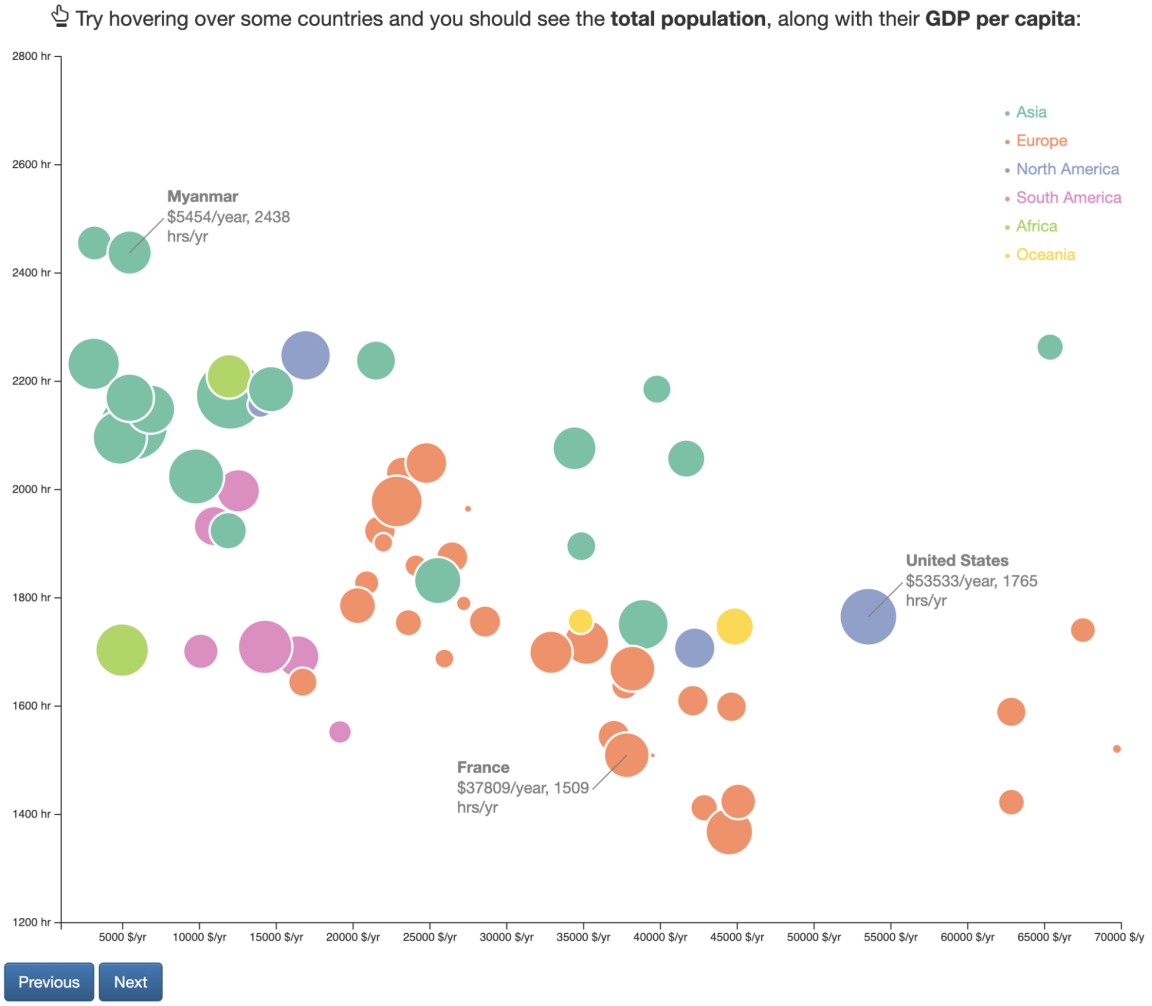
Scenes:

This project uses the **Interactive Slideshow** narrative structure. The project has been organized into five scenes. Each scene corresponds to a slide transition, each slide is implemented as a separate HTML page. The scene structure is as follows:

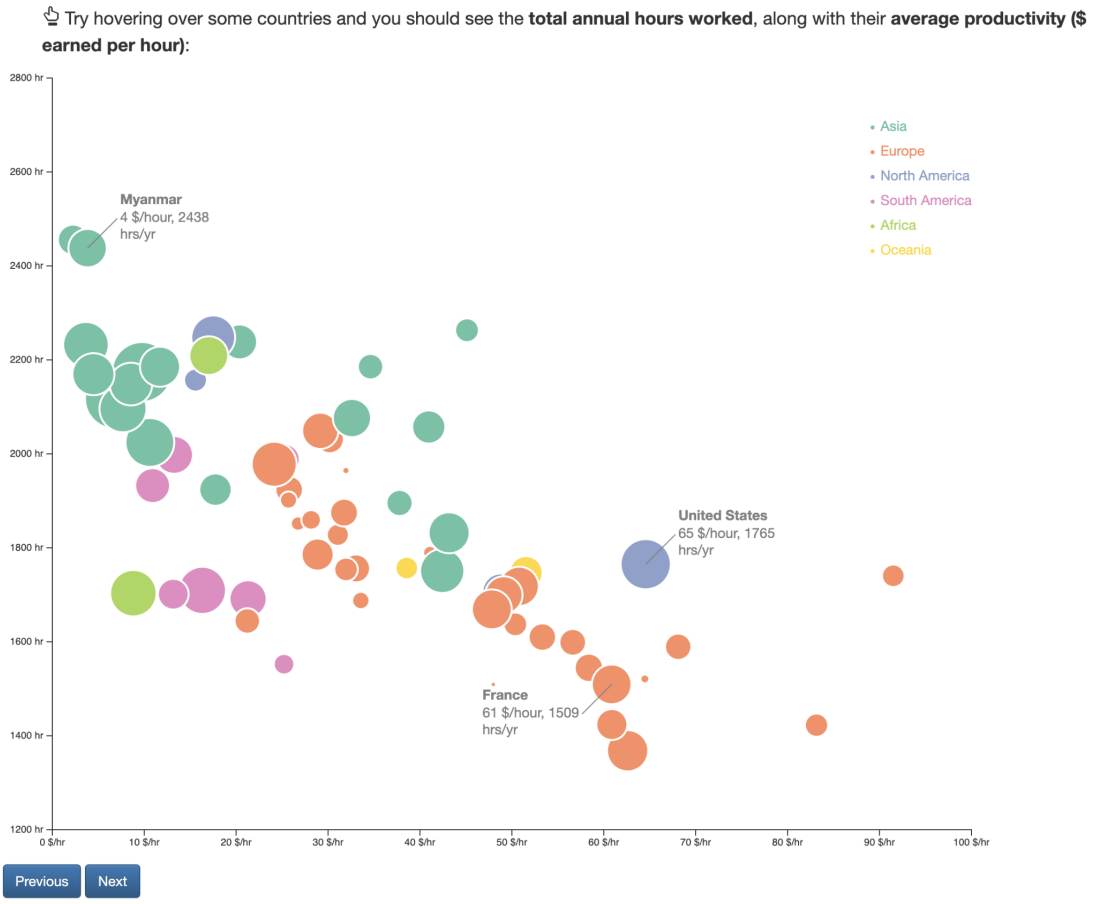
1. **Scene 1**: This scene sets the context for the message and provides a simple overview of the narrative visualization. It provides background information to guide the audience through the slideshow.
2. **Scene 2**: This scene provides a scatterplot of the GDP per capita of different countries in the world on the horizontal axis, against the total number of hours, worked per year on average by a worker in the country. For example, workers in Myanmar have a very low GDP per capita but some of the highest total work hours in the world. Conversely, countries like France have some of the highest GDP per capita but some of the lowest work hours in the world. Several points of explanation are provided to aid the understanding of this chart.
3. **Scene 3**: This scene provides a scatterplot of the labour productivity of different countries in the world on the horizontal axis, against the total number of hours, worked per year on average by a worker in the country. For example, workers in Myanmar have very low labour productivity but some of the highest total work hours in the world. Conversely, countries like France have some of the highest labour productivity but some of the lowest work hours in the world. Several points of explanation are provided to aid the understanding of this chart.
4. **Scene 4**: This scene is meant to explain the conclusions drawn from the data plotted in scenes 2 and 3. This scene has a country dropdown (parameter selected by the user) and as the user picks a country - we visualise its growth in labour productivity over the last few decades. There is a D3 transition between different selections so once the user changes their country selection, a smooth transition is made to the next country's data. The annotations on the graph change based on the user selection.
5. **Scene 5**: This is the concluding season, and provides the key takeaways and summary of the message introduced in scene 1. A choropleth with tooltips on hover has been provided to give the audience an overview of the world and its GDP per capita and population.

Annotations:

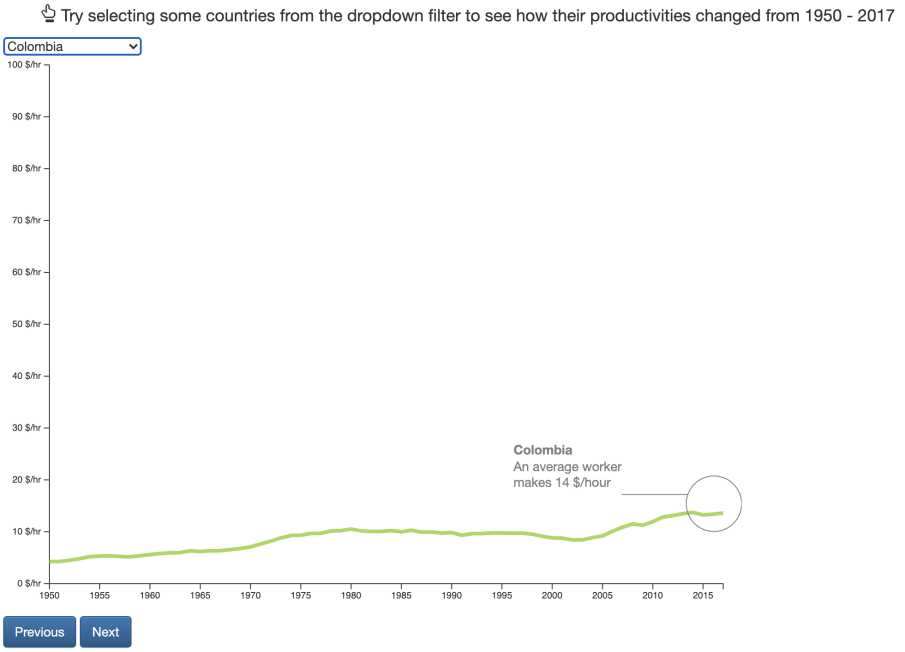
- In **Scene 1**, three countries are introduced to the audience and these countries are tracked throughout the presentation to compare their economic growth and labour productivities - Myanmar, France and USA. These countries have been annotated on Slide 2. and 3. Furthermore, the user can interact with all the bubbles in the scatterplots to see more information about the other countries via **tooltips** that follow the same template as the annotations.
- In **Scene 2**, the consistent annotation template of Country Name, GDP per year and total number of hours worked in a year has been used.



- In **Scene 3**, the consistent annotation template of Country Name, labour productivity per hour and total number of hours worked in a year has been used:



- In Scene 4, the annotations are *parameterised* by the country selected by the user. The audience can trigger changes in the annotations by selecting different countries as the parameter. This is an example where the annotations change *within* a single scene. This is done for greater interactivity for the user, to encourage them to change the country parameter, and see the labour productivity in 2017.

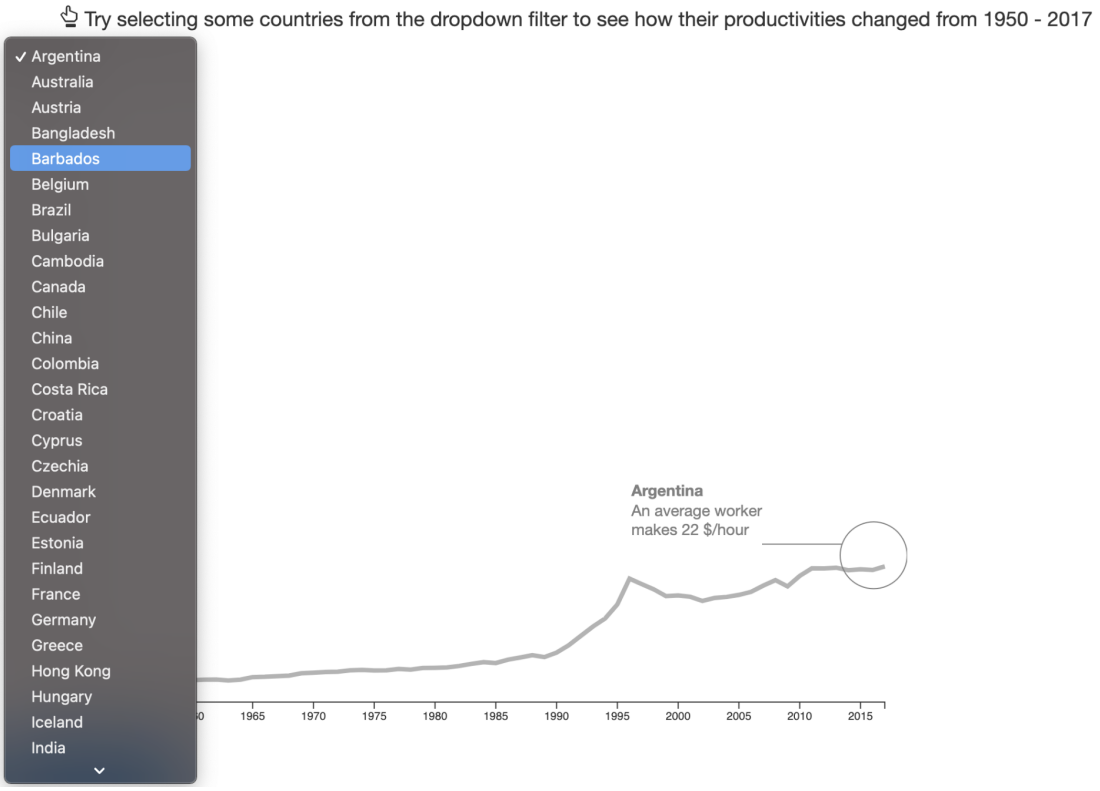


Parameters:

For this narrative visualization, the only parameter is **country**. Depending on the country selected by the user, different data is displayed.

- In Scene 1 and 2, the country parameter is preset to three values Myanmar, France and USA. This is a deliberate decision to contrast the same three nations at various states of their development cycle. These three countries are annotated on both Slide 1. and Slide 2.
- However, a **hover/mouseover** is also supported for all the bubbles in the scatterplot, and this allows the user to *select* a country and see its information in the tooltip:

- In Scene 3, the user is allowed to select the **country parameter** from a dropdown list, and this changes the line chart, and the annotations along with it. The country parameter defines the state of the scene, and shows data for the country selected by the user. This allows the user to gain a sense of the technological innovation in these countries.



Triggers:

- The primary triggers used to change from one state of the narrative visualization to the next are the **Previous** and **Next** buttons at the bottom of every slide. These buttons have been slightly raised, and a gradient has been provided as a means of **affordance,** so the user knows that they can click on them.
- In Scenes 2 and 3, the user is encouraged to hover over and see the tooltips in the charts because of of a raised “click” button that asks them to hover over the chart.
- In Scene 4, the state of the chart can be manipulated by the user by selection from a dropdown. This dropdown has an inverted caret that signals that it can be used to select a value from a list. This is another example of an affordance.
