CS 171/CSCI E-64: Visualization

Homework 1, Problem 1: Design Critique

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For this problem I chose the People Movin visualization.

- http://www.peoplemov.in/

Questions

1. Who is the targeted audience?

   The audience is anyone interested in migration patterns. This could scholars, social scientists or just the curious. The visualization is easily understood by the layperson so the audience is broad.

2. What tasks does the visualization enable?

   The visualization allows you to the migration and immigration patterns of a chosen country. Specifically it allows you to see what destination countries the people of a given country are migrating to and in what volume. It also gives vital migration and immigration statistics, such as the top destination countries, on the country selected. Finally the visualization allows you to compare the data of different countries together.

3. What data is represented in this visualization? Be specific.

   This visualization broadly shows a selected country's migration patterns (what other countries it's citizens are migrating to). The volume of people migrating to that country is also somewhat represented by the thickness of the lines connecting the one country to the many. It also shows immigration and migration statistics about that country such as the total population, the number of emigrants or immigrants, and the top countries the emigrants or immigrants are moving to.

   There are also migration statistics in the middle of the visualization showing the top countries for a given data point (i.e. Top Migrant Destination). The size of the bar for each country also seems to convey information about the number of different countries its people are migrating to.

4. How is each data type visually encoded? Do you think the encodings are appropriate?

   Vertical bars represent the countries and the emigration/immigration patterns are represented as a slope graph. On the left side are the countries that people are emigrating from and on the right are the countries that people are immigrating to.

   At first glance I thought the visualization was representing a county's emigration/immigration volume with a combination of vertical bar length and color. The higher the volume of people moving the longer and more red the country bar

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seemed to be. Countries with lower volume of people moving looked like they had a smaller bar in the bluer shades.

However the that interpretation of the coloring is problematic, it seems that some large countries such as Australia are in the green shades where one would think they would be trending towards red. It also appears that countries with similar numbers of emigrants or immigrants (China and Mexico have similar numbers of emigrants) are different colors. No mention of this coloring is given in the description of the site so it seems likely that the author has, in actuality, used the coloring to highlight countries of interest such as the United States, Mexico and China.

The height of the bar representing the country also seems to just be representing the number of different countries it's people are emigrating/immigrating to. Countries like Greenland do not have a high volume of émigrés and are thus represented with a short bar. The United States has a high number of immigrants and thus has a very long bar on the right side of the visualization.

Additionally the number of people moving between countries is encoded by the thickness of the line connecting the two countries in question. The higher the volume of people moving between countries the thicker the line is.

I think there are several problems with the encodings. The colors and the length of the bars showing the different countries don't really seem to reflect any data, or if they do it is unclear what they are representing. I think that the author could use this combination of length and color to represent total population and the total volume of people emigrating/immigrating from the country in question.

The thickness of the slope lines is also a problem – most of them are very thin and it is difficult to ascertain the difference between a very low, low and medium volume of people moving between countries. The ability to drill into more detail on individual lines would help with this.

5. Does the visualization have graphical integrity? Why or why not?

In it's present form I don't think the visualization has clear graphical integrity for the following reasons:

a) It is not clear how far back in time the data in this visualization goes. There is a note saying it is 'the latest available as of 2010' but that does not clearly tell if the data is only for the year 2010.
b) The thickness of the lines connecting the one country to the many. All of the lines with a few exceptions are the same thickness so it is hard to know at a glance the volume of people.

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6. What design principles are at work in this visualization? List as many as you can, and be specific.

   I think the author employs the following design principles:

   Data Ink Ratio: There is really no non-data ink in this visualization. All of the graphics with the possible exception of the country bar length represent data.

   Avoid Chartjunk: The author does not have a lot of extraneous chart junk in the visualization. There are no background graphics or superfluous lines or images that are not needed to represent the data.

   Increase Data Density: There is a large amount of data in the chart especially with countries that have a high volume of immigrants/emigrants. One could argue that there is too much data and that some of it could be put into the background.

   Aesthetics: The visualization is very pleasing to the eye and invites the user to explore the data.

   Playfulness: The visualization is interactive and invites the user to click and explore the different data elements by clicking on the different countries.

   Vividness: The black background and the bright colors of the slope graph make the chart very vivid and stand out.

   Contrast: The bright red colors of some of the countries draw the users attention to interesting immigration patterns of those countries.

   Alignment: The emigrant and immigrant bars on the left and right are vertically parallel, but not aligned with each other top to bottom due to the different volumes of emigrants and immigrants. I think that this visualization employs alignment to a certain degree, but not completely.

7. Do they support the tasks and enhance the meaning of the visualization?

   I think that the design principals do support the tasks of the visualization. At a quick glance the user can pick a country and very quickly see the overall migration patterns of that country which is the overall goal of this visualization. It would be very difficult to have this view of the data in a standard chart or tabular format.

8. Do you like or dislike the visualization?

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Despite some of the problems I do like this visualization. At a high level you can see the migration patterns of a country in a clear way. Clearing up some of the issues would make this a great visualization (it does look like a work in progress).

9. What would you do differently to better support understanding?

There really isn't a key explaining the different colors and bar size for the different countries. I can infer their meaning, but it is not obvious at first glance and takes some analysis to get the true meaning.

The data is also 'the latest available as of 2010.' It is not very clear what this means – is this data only for the year 2010 or does it go back further? If it does go back further, how far back in time does the data go?

The ability to drill into the data would be nice. For instance if you could select one of the individual lines connecting two countries and get a more detailed view with additional statistics. It would also be good to be able to zoom out – the visualization is so large you need to scroll to see the entire picture and it is hard to get a full sense of the migration patterns of that country.

Finally some of the smaller lines could be shaded into the background similar to the Cairo fertility rate visualization so that the higher/more interesting data points stood out from the noise.