Global Living Costs

A Comparative Analysis Across Time and Space

Siyi Liu
Rongjun Gao
Samuel Dietz

Background

Nowadays, economic development and Immigration policies in different countries encourage individuals to seek better job prospects, higher wages, and improved their living standards. When considering job opportunities and career paths, many people are gradually not restricted in the labor market of their home countries, but are also willing to know the chance from global companies worldwide. Even for the employees who already have positions, relocation is necessary to establish or manage offices in different countries. It is always attractive and competitive that better international communication and cooperation can be forested.

Besides career development. another important factor is a personal lifestyle. In the post-covid era, remote work is preferred by some companies and employees, becoming a new working style. The advent of digital nomads has further transformed immigration and relocation trends. These individuals leverage technology to work remotely while traveling, affording them the flexibility to choose destinations that offer favorable living conditions, affordability, and reliable internet connectivity. Digital nomads prioritize the freedom to design their career paths around their desired lifestyle, combining work and travel experiences. Therefore, people have a growing interest in knowing the lifestyle in different countries, to fix the information gap for better personal decision-making.

The aim of our project is to provide an informative and direct visualization and offer valuable insights into the worldwide cost of living. By providing a macroscopic view of the development of lifestyle and offering personalized insights, we aim to support individuals in making informed choices that align with their aspirations, values, and financial capabilities.

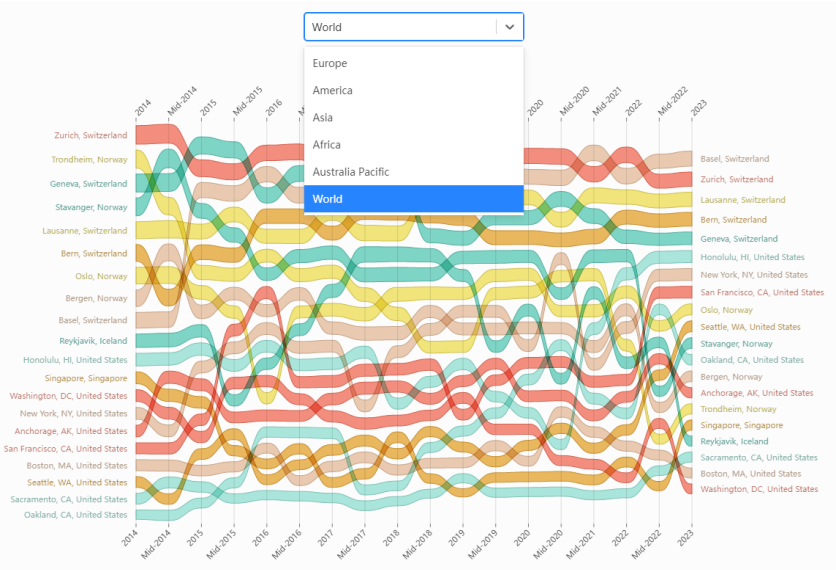
Our Path.

Step	Challenge
> Data pre-processing We scrapped the dataset from the Numbeo website, including eight indexes reflecting the quality of life. After statistical analysis, we selected the Cost of Living Index, one of the dominant factors among all.	The complete dataset was so huge that we took some time to extract the most interesting part. Considering novel visualizations different from the original website is not easy.
> Key visualization design We designed three key plots for the first draft: map, bump plot, and scatter plot. intending to present temporal/spatial changes from a global viewpoint. Meanwhile, users could explore their relevant countries	Given a worldwide dataset, we thought about how to tell a story. Visualizations should be constructed in a logical way and attract users, instead of making them lost.
> First draft of website We gave a rough version of the bump and scatter plot with a simple html file. It was exciting to have our interactive visualization but still needs to be modified and improved.	To use the Nivo packages and keep our code consistent, we transferred from D3 to React. The map visualization takes more time than expected.
> Polish visualization & layout Now we have reorganized the dataset, added faceted searching, and more mouse interaction to show attributes. Furthermore, we optimized the HTML layout with a navigation bar and storyline format.	Combining individual visualizations into one is the most challenging part.
> Final product !!	

Tools: React nivo

Visualization Process.

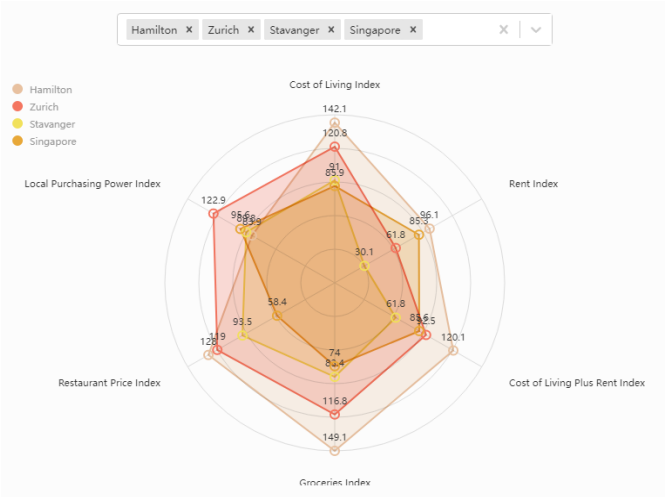
> Area Bump Chart



The area bump chart traces the changes in the cost of living in the recent ten years. Countries from five regions that have the highest or lowest ranks are selected for comparison, while the “World” tag shows top 20 ranking worldwide. Area and flow represent relative value and rank fluctuation respectively.

Switzerland, Norway, Iceland, Singapore, and the US are the most expensive countries.

> Radar Chart

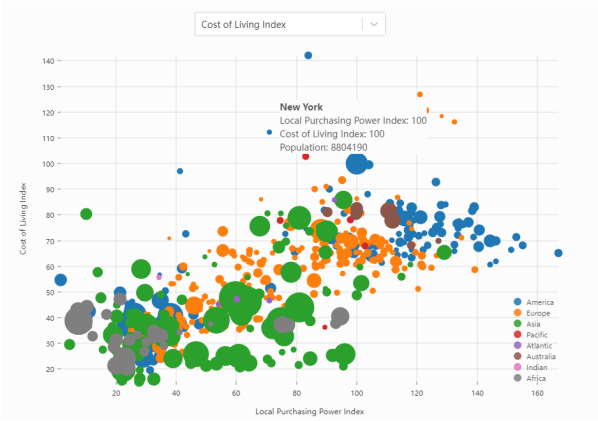


Even though the area bump chart well-present the historical development that enables us to top-ranked countries, the users may not directly find the cities they would like to know. Therefore, we implemented a tag-searching function on the radar chart, to compare the five cost-of-living indexes of up to four cities.

Compared to the original “Cost Of Living Comparison” function on the Numbeo website, our visualization works especially for those who don’t have specific target cities to browse and explore. This is the aim of our website, to expand people’s current understanding and discover more opportunities.

Population and Cost of Living Index

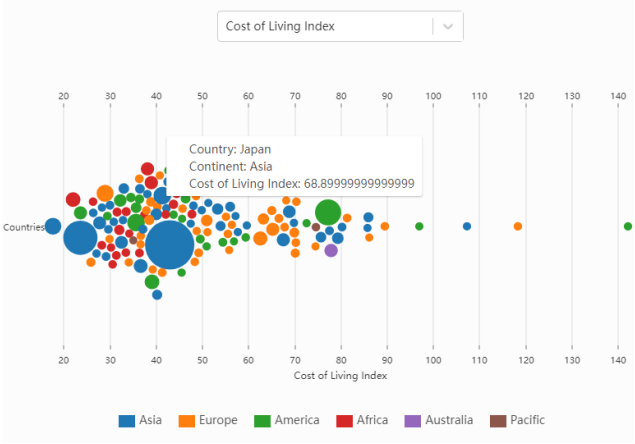
> Scatter Plot



Based on our first draft sketch, we added mouse interaction to indicate the exact value of indexes and population, providing more information besides the two axes and bubble size.

We could summarize from the figure that most of the cities in Africa and Asia still maintain a low cost of living, except for several international cities and developed countries. On the other side, there is a growing trend in the cost of living from Europe, the Pacific, Australia, to America.

> Swarm Plot

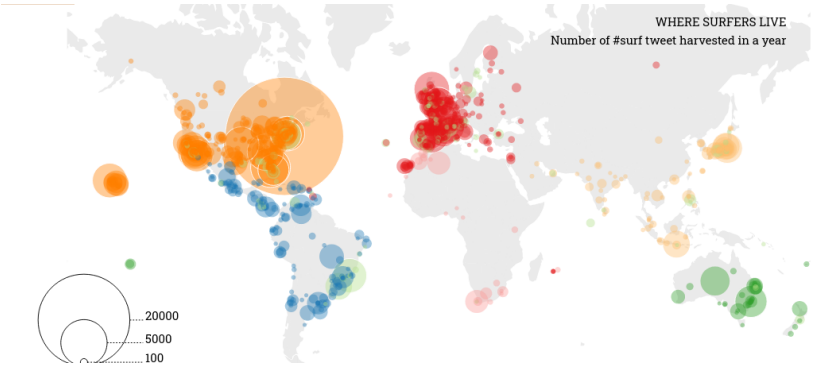


It is worth noting that many cities in America have significantly higher local purchasing power index, which shows relative purchasing power in buying goods and services for the average net salary. Switzerland has a comparable value in this index but with a much more expensive cost of living.

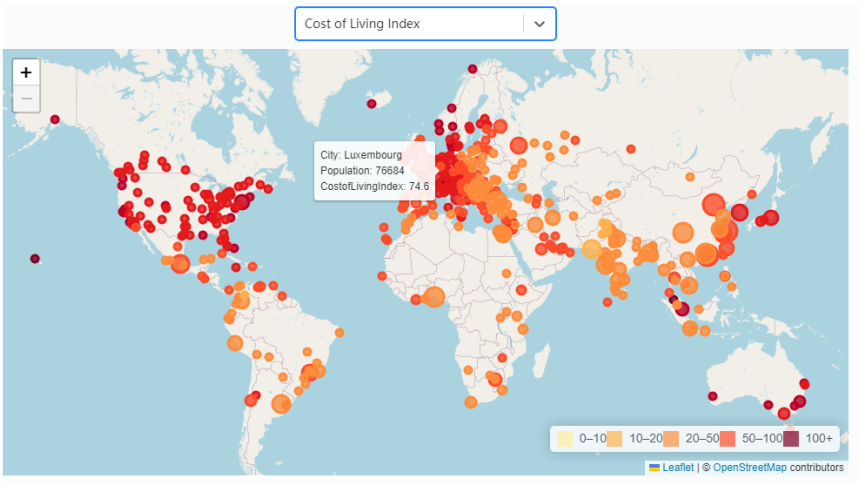
By plotting another swarm plot, we could capture the average value and outliers for each index. It is a type of non-overlapping scatter plot drawn on one axis.

When viewing the restaurant, rent, or groceries price indexes, the top countries list is similar with slightly different rankings. However, regarding the local purchasing power index, we could observe a clear First group: the United States, Switzerland, and Luxemburg. It is followed by Eastern/Northern European countries, developed Asia countries, China/India, Eastern European countries, and other Asia/Africa countries. A clear North-South divide.

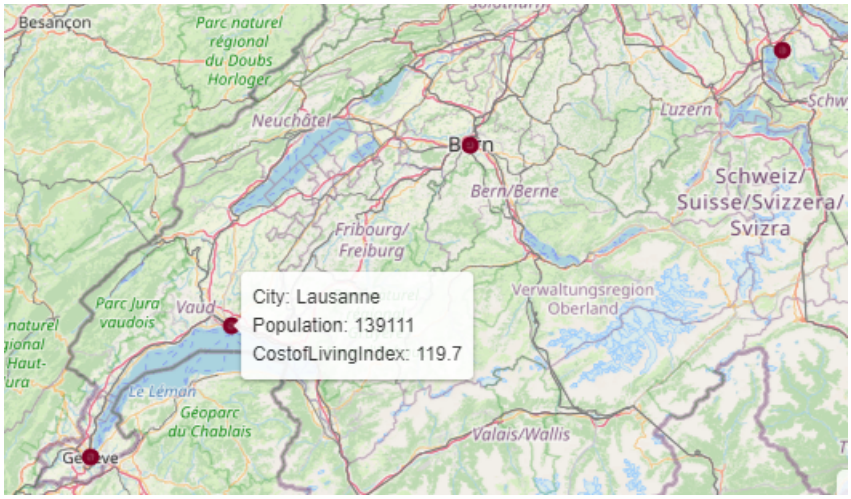
> Worldwide MAP



Sketch reference



Overview



Zoom in

At the very beginning, we came up with the idea that a visualization of worldwide map is necessary to show the spatial distribution of data. However, since the corresponding geographical coordinates and population information are needed, it was a bit challenging for us to deliver the results in the 2nd Milestone together with other visualizations.

After more discussion and adjustment, finally we realized this function in our final version. We could select one of the indexes, then zoom in on the scope to explore different regions and cities. The size of the bubble represents the population in corresponding cities and the color show the value of the chosen index.

As an example, we attached a screenshot of Lausanne, where we are living now. With the map, we could compare it easily with the nearby cities.

Conclusion.

In conclusion, we have successfully accomplished our major visualization goals in this project, and obtained much more skills than expected. No matter it is the explanatory analysis and pretreating of unqualified data, or the collaboration among members to combine the separate visualizations into an integration. It was a challenging process but finally, we made it.

After constructing a website from zero, we also realized how valuable it is to visualize a huge dataset in logical and attractive ways. Both generation of creative prototypes and implementation matter.

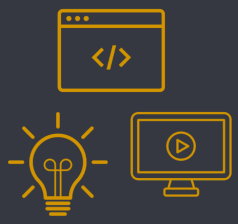
> Peer Assessment

Siyi Liu

- Discussion and brainstorming
- Visualization: Scatter plot, swarm plot, radar plot
- Code integration
- Web layout design

Rongjun Gao

- Discussion and brainstorming
- Visualization: Area bump plot
- Webpage sketch
- Process book



Samuel Dietz

- Discussion and brainstorming
- Visualization: Worldwide map
- Screencast