

Process Book, COM-480 Data Visualization

Sylvain Lugeon Rodrigo Soares Granja
Benno Schneeberger

28.05.20

Contents

1	Process	1
1.1	Initial idea	1
1.2	Representation of an athlete	2
1.3	Making Olympics great again	4
1.3.1	Dynamic interface	4
1.3.2	From 80's to 2020 design	6
1.4	Adding the final touch	8
2	Peer assessment	8

1 Process

1.1 Initial idea

After hesitating about which aspect of the Olympic Games to focus on, we decided that we would focus exclusively on the physique of the athletes. From the EDA, we knew that there were some physical differences between the disciplines. Another possibility would have been to also create a visualisation about results, but creating only one visualisation about athletes physique allowed us to spend more time thinking about the design and the implementation.

The idea was the following: first visualize the physical characteristics of a given discipline selected by the user, and then compare several selections. The comparison could be implemented with a *small multiple* design.

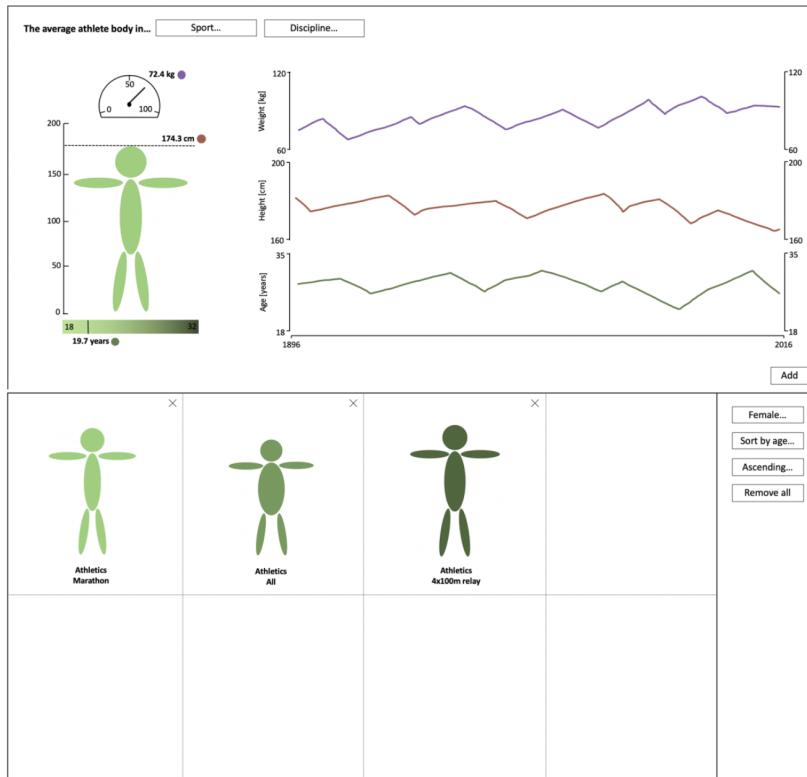


Figure 1: Initial design sketch.

1.2 Representation of an athlete

A first key element of our visualisation was how to graphically represent athletes physiques. We had three characteristics to represent: the **height**, the **weight** and the **age**. We quickly thought about using a human-like figure, that we could change so that the differences between the athletes would be visible.

The height would be represented with a general scaling. For the weight, we decided to use the BMI (Body Mass Index) to scale the figure horizontally. The BMI is the weight divided by the squared height and is an indicator of the *corpulence* of a person. The reasoning was: first scale a default sized figure so that it matches the desired height, and then horizontally scale the central ellipsis so that it matches the desired corpulence.

The age was yet to be represented on the figure, we decided to use the a light to dark green for that purpose. The inspiration come from the nature, the riper a fruit becomes, the darker its color.

As per the initial sketch, we wanted to first show to the user the measurements of an athlete, in an **absolute** way, using a balance for the weight, as well as two axis for the height and the age. The goal of the small multiple was to display the differences between the athletes, in a **relative** way. Because the design of the figure is such that it channels all the relative information, no scale was needed in the small multiple part.

The first figure design used only six ellipsis, which made it look very minimalist, nearly child-drawing like. We tried two other ways of drawing it: by using more ellipsis to make the silhouette look more human or to directly use a human silhouette.

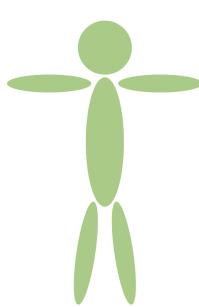


Figure 2: Original.

Figure 3: More ellipses.

Figure 4: Human like.

The advantage of using a six ellipsis design is that we were changing the corpulence by scaling only the central ellipsis. When we tried to apply the same concept to the human-like silhouette, i.e horizontally scale the figure without modifying the head, arms and legs lengths, we thought it looked uncanny and not human at all.

Thus, we decided to stick with the six ellipsis design. This simple design also allowed us to efficiently implement transitions to change from one figure's shape to another.

We could finalize our first attempt at building the website using simple structures for representing the graphs and small multiple container.

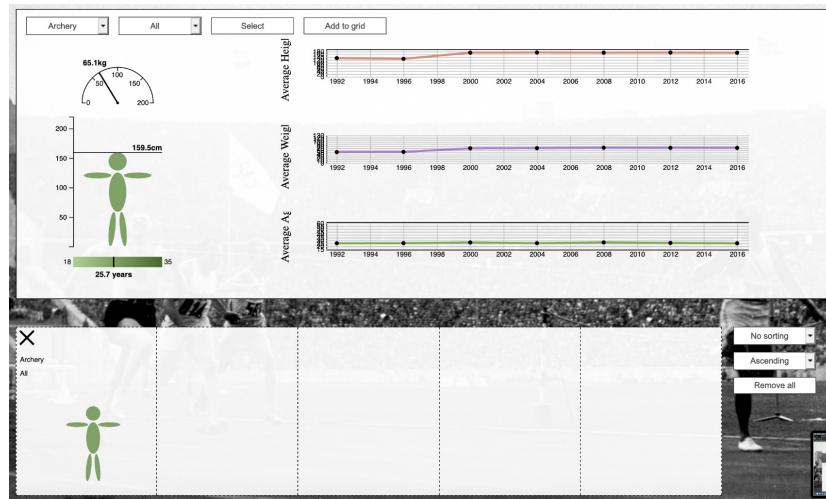


Figure 5: First website attempt.

It is a good start but more work was needed to make it interactive and good-looking.

1.3 Making Olympics great again

We were happy with our athlete design and description but there were no dynamic functionalities, neither in our graphs nor in our small multiple container. The general design was also to be brushed up.

1.3.1 Dynamic interface

We started by changing the actual selection of sports and disciplines.

Our first implementation required clicking on the "Select" button to confirm our sport and/or discipline. This would prompt the update of the description and the graphs. Furthermore, we also required the user to click "Add to grid" to perform this action. These constraints made our website old and not user-friendly.



Figure 6: First implementation of the selection tools.

Firstly, we made it such that the detailed description of the athlete and the graphs were directly updated whenever there was a change in one of the dropdown buttons. That enabled us to remove the "Select" button which became obsolete. We also incorporated a **search bar** which allows a user to look for a specific Olympic event more easily. We finally decided to move the add action to the small multiple.



Figure 7: Updated implementation of the selection tools.

We then gave more thought to the small multiple decided to improve it by:

- Reducing maximum number of displayed objects to five.
- Making empty frames invisible.
- Instead of the 'Add to grid' button, use a + sign on right-most empty frame.
- Add the sex and the years in the frame.
- Moving action buttons related to the container to the top to improve space utilisation.

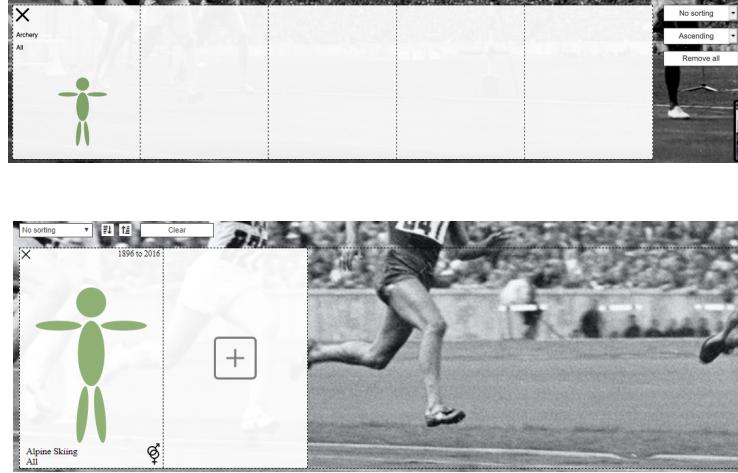


Figure 8: Old and new versions of the small multiple.

We believe these changes made the small multiples more interactive and modern.

Then we focused our attention on improving the graphs.

In our first implementation, we used default template graphs. It was now the time to make them interactive and good-looking. We proceeded by :

- Modifying the graphs to resemble those of the sketch. This included displaying only one X axis on the bottom of all graphs containing all covered years.
- Implementing a brush with year selection. This allowed users to choose which years were selected for calculating the Athlete's statistics on the left. Another advantage is that one can add elements to the small multiple container with specific year selections and thus compare different time intervals. The Athlete's description is automatically updated after the selection is performed. We use color to notify the user of which points have been selected or not.
- Implementing a hover action over the points to display the exact values (cm, kg or years) in a tooltip. Here again color is dynamic and gives life to our visualization.
- Adapting Y Axis scales to the displayed values for better data comparison

On the figure 9, one can see how these changes improved the dynamic of our data visualization.

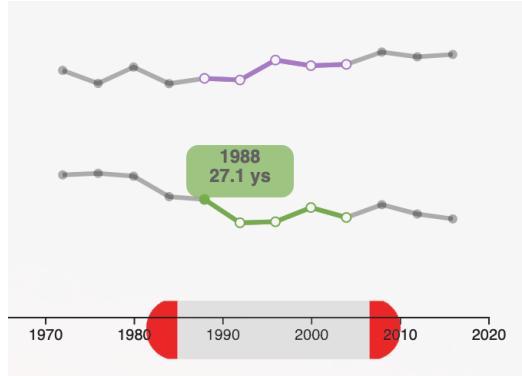


Figure 9: Features added to the graphs.

We were pleased with our website functionalities, interface and user experience. Despite that all the elements of the of visualisation were now graphically *in accord*, the overall design was still looking a bit old. We decided to give more attention to details that could step up the website's look.

1.3.2 From 80's to 2020 design

We changed the dimensions so that both the selection and small multiple part could fit on only one page with standard dimensions. This was important to make the user experience more pleasant.

We made boxes' corners round and added some margins between those to make the visualization look less packed. We also spent some time thinking about the buttons' labels, if it could be a good idea to replace text with icons (e.g. replaced ascending/descending labels by icons) or by a term that sounds more user friendly (e.g. replaced "Remove All" by "Clear").

Regarding the font and the design of the different buttons, we imported Skeleton¹ which improved the overall design of our page. We tried multiple backgrounds related to the Olympic Games and finally decided on one, representing a running track, which gave the best result.

¹<http://getskeleton.com>

We also greatly improved the design of the small multiple frames by adding and reorganising the displayed athlete's information. We decided to add the average height, weight and age to be able to perform a better comparison between the different athletes represented in the small multiple.



Figure 10: Second attempt frame.

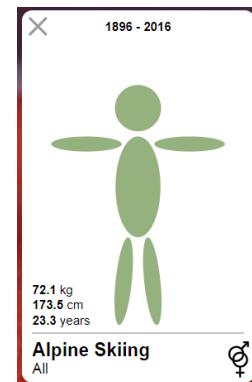


Figure 11: Final frame.

With all those changes, we were able to come up with the following design:

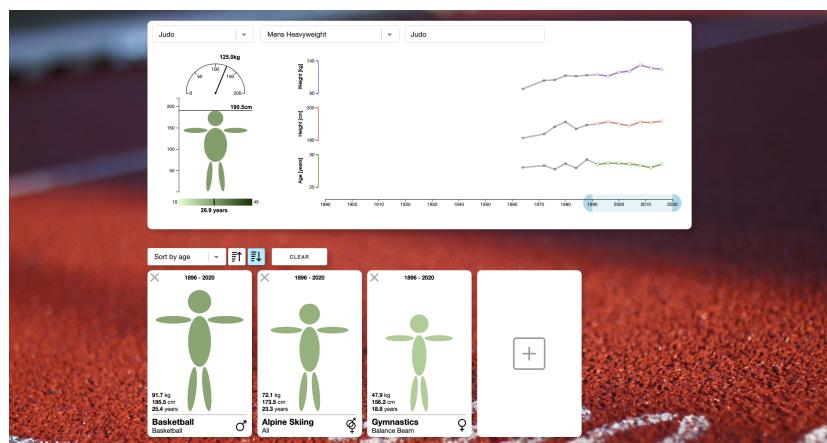


Figure 12: The final design.

1.4 Adding the final touch

Our website was interactive, modern and sexy. But it was missing one thing: a **story**. There were no description about the aim of the visualization, and how to use it.

To introduce the topic, we implemented a circle packing showing the differences between the sports. Coupled with two paragraphs, the user is now more guided through the visualization.

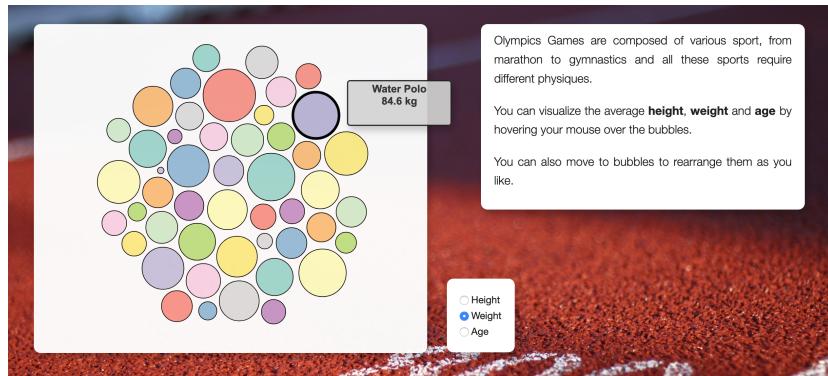


Figure 13: An introduction to our main visualization.

2 Peer assessment

During the whole duration of the project, we all met on a weekly or bi-weekly basis to discuss the things implemented in the meantime as well as the design and functionalities of our visualization. Roughly, Sylvain focused his work on the general design and the representation of an average athlete, Rodrigo the part with the graphs and circle packing and Benno everything related to the the small multiple. All of us also helped improving or modifying the part of the others. Overall, we all spent a similar amount of time on this project.