
dataringz

Introduction

Welcome to **DataRingz**, your interactive gateway into the heart of the Paris 2024 Olympic Games.

With dozens of sports, hundreds of events, thousands of athletes, and an entire city transformed into a global stage, the Olympic Games generate an overwhelming amount of data. But what if you could explore it all, from medal trends to individual performances, directly on a 3-dimensional map of Paris ?

DataRingz is a web-based data visualization experience that lets you dive into the Games like never before. Click on a venue to see which sports are hosted there and explore various athlete stats, compare countries, all through a clean, interactive interface powered by **Nuxt**, **Mapbox** and **D3.js**.

More than just numbers, DataRingz tells the story of Paris 2024 through data. It reveals patterns, highlights achievements, and celebrates the diversity and scale of the world's greatest sporting event.

Let the Games begin. In 3D, in motion, and in data.

Concept and Design

Why the Olympics?

At the beginning of the semester, we started brainstorming about what we wanted to tell as a data story. We quickly converged towards sports, as we are three passionate fans who love watching competitions at the highest level. This interest, combined with the excitement we felt during the Olympics last summer, made the Paris 2024 Games a natural and inspiring choice for our project. The richness of the dataset and the universal appeal of the event gave us a solid foundation to build a compelling visualization.

Initial Objectives (from Milestone 1)

Our primary goal was to create an engaging and informative visualization of the Paris 2024 Olympics dataset through an interactive map of Paris. We wanted users to easily explore Olympic venues, discover related sports, athletes, and events, and get meaningful insights about countries and performances. The focus was on delivering a rich, intuitive experience combining geographic context with detailed Olympic data, accessible both to sports enthusiasts and casual users.

From Idea to Interactive Map

Early on, we envisioned an interface focused on interactivity and ease of exploration. Inspired by laphase5, a 3D map project with clickable points of interest, we aimed to bring Olympic data to life through a similar approach, allowing users to navigate a 3D map of Paris, click on venues, and access detailed stats on events, athletes, and countries. We also included a "globe mode" to connect the local view to global participation.

Initially, we planned a static map with simple pop-ups, but the design quickly evolved. We added 3D venue visualizations for a more immersive feel, improved search with enabling all types of queries (athletes, events, sports, countries, venues...), and structured content into dedicated subpages for clarity. This mix of geospatial storytelling and interactive navigation became the foundation of our user experience.

Choices in Navigation and Color Palette

Navigation: We chose a layout with a persistent map background and floating navigation elements to keep the map central while providing quick access to search and view modes. The split into a root overview page and detail subpages improves clarity and UX.

Palette: The color scheme is very neutral, both in light and dark mode, giving a professional look reflecting the Olympic spirit and Parisian ambiance.

Data and Implementation

Data Sources

Our project is based on the "Paris 2024 Olympic Summer Games" dataset, available on Kaggle. It provides a comprehensive set of CSV files covering all aspects of the Games: athletes, coaches, events, venues, medals, schedules, teams, and even the Olympic torch relay. This dataset offered both the breadth and granularity needed to build meaningful and varied visualizations. We also used an additonal dataset containing all medals rankings from 1996 to 2020 Olympics, to see countries progression. It is also available on Kaggle, at this link.

Data Cleaning and Structuring

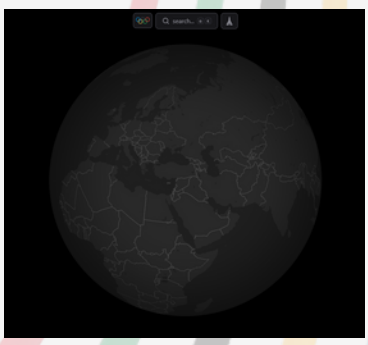
While the dataset was fairly well-structured, we still performed several preprocessing steps to make it suitable for visualization. We standardized key field as identificators like athlete names, event titles, and country codes, to ensure consistency when merging tables. Missing or incomplete values, particularly in preliminary results and scheduling data, were also addressed. Our Exploratory Data Analysis (EDA) helped us identify the key statistics we wanted to highlight (some of which were quite complex) and guided us in designing cleaner, more interactive visual representations than what typical static plotting libraries (like Matplotlib) would allow.

A major part of the data preparation involved merging different tables to create consolidated views. For example, athlete data had to be joined with medals, events, and NOCs to allow queries like "show me all medalists from a given country." We also generated derived metrics, such as medal counts per country, or the number of events per venue, the gender distribution of each country and sport, to support specific visual elements. These transformations were mostly handled in Python during the exploratory analysis phase, and the processed JSON files were then imported into the frontend.

Technical Choices

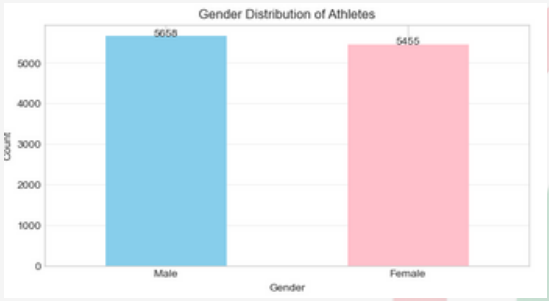
Nuxt.js: We used Nuxt as the main framework to build the web app. Its support for server-side rendering, routing, and modularity helped structure the project cleanly and improve performance.

Mapbox: We used Mapbox to render the interactive 3D map of Paris. It allowed us to display Olympic venues as clickable 3D buildings and highlight them in red (see the left image). We also used it for visualizing our globe, where the user can select a country to obtain statistics, we thought it was a very intuitive and eye-catching way of providing these informations (right image). Here is what it brought us:

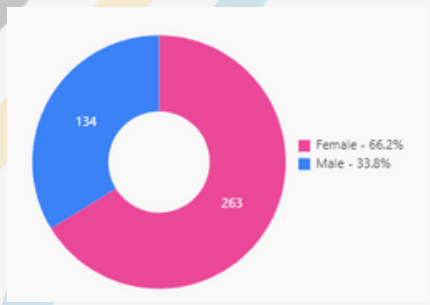


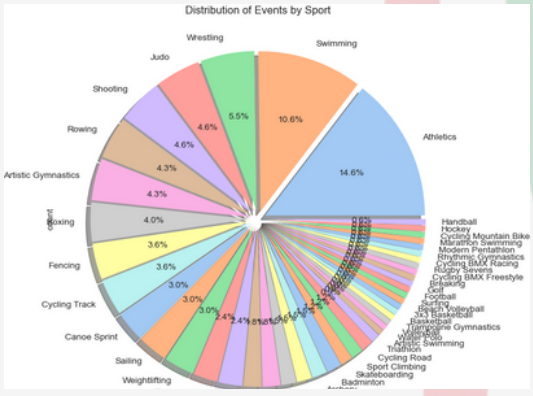
(yes, we implemented a dark mode, check it out!)

D3.js: In line with course requirements, we integrated D3.js for data-driven components, including pie charts and other statistical elements shown on athlete or country pages. While Mapbox handled the geospatial visualization, D3 complemented it by offering precise and customizable data graphics. Below are few examples of our original plots, and the final ones.

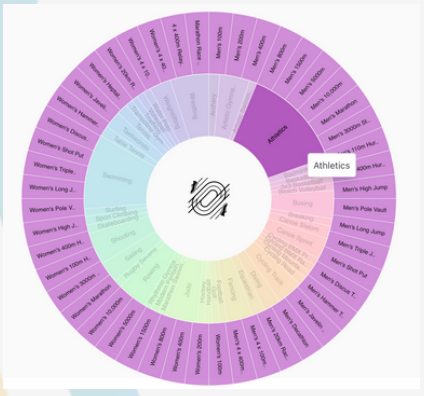


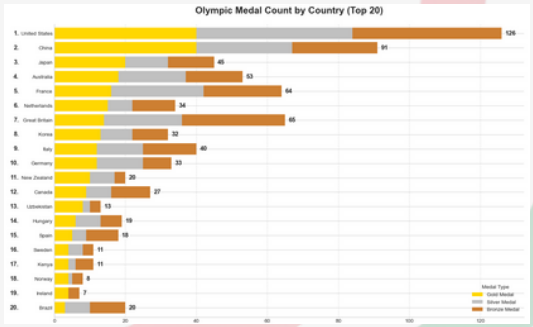
Gender distribution



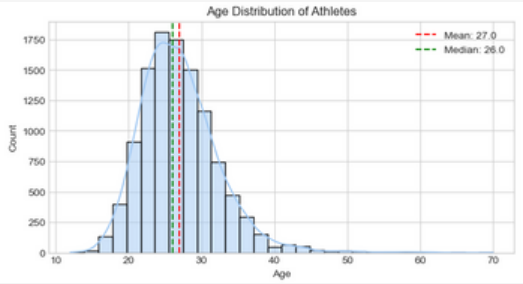


Events repartition

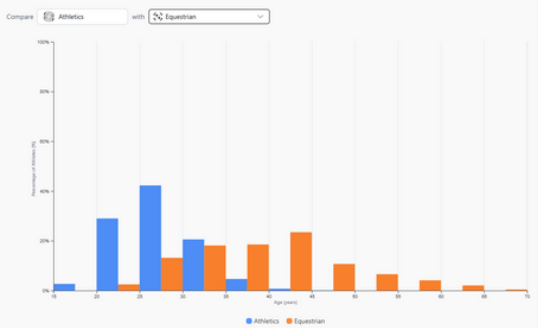




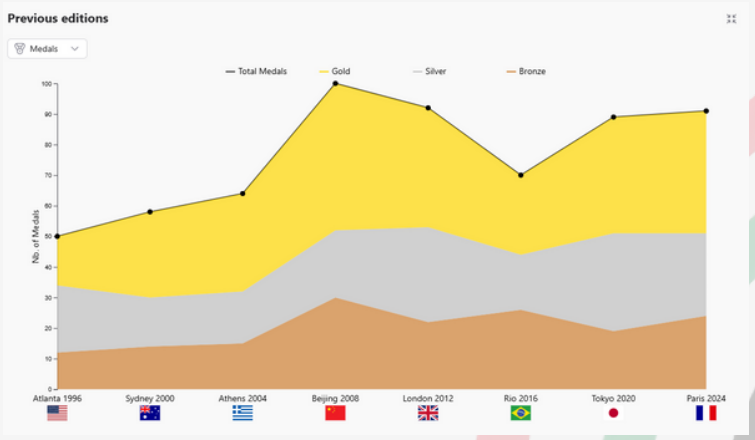
Medals ranking (made it as a interactive race)

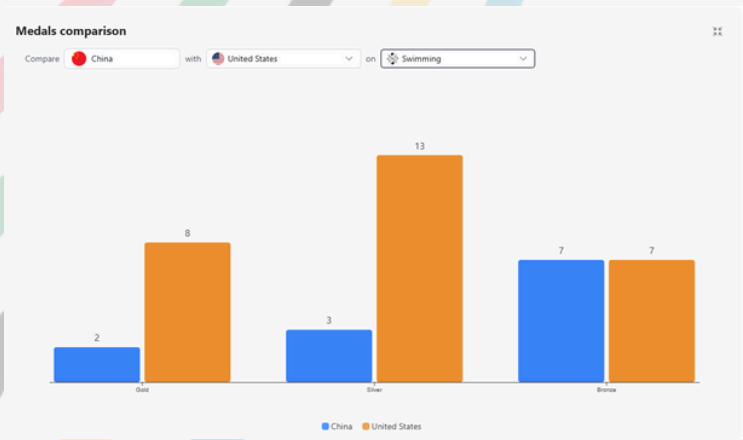


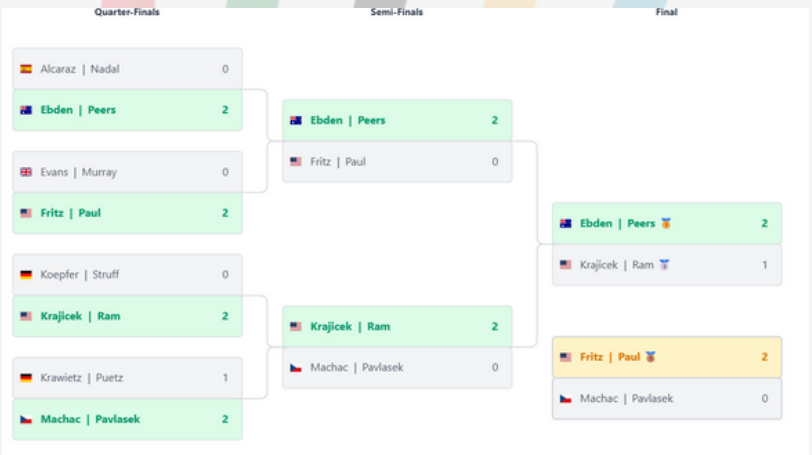
Age distribution of each sport (became comparable with a selectable sport)



After Milestone 2, we identified a few additional statistics that could enhance the user experience. First, we introduced a comparison of each country's performance with previous Olympic editions (as provided in this additional dataset), offering insight into how nations have evolved over time. Second, on each country page, we added an interactive graph allowing users to compare that country's performance with another, either across all sports or within a specific discipline. Finally, to fully leverage the dataset, we included detailed results for each sport. For those with a tournament-style format, we developed a dedicated component to represent match progressions. All these features are implemented as D3.js components. You can see visualizations below, in the respective order.

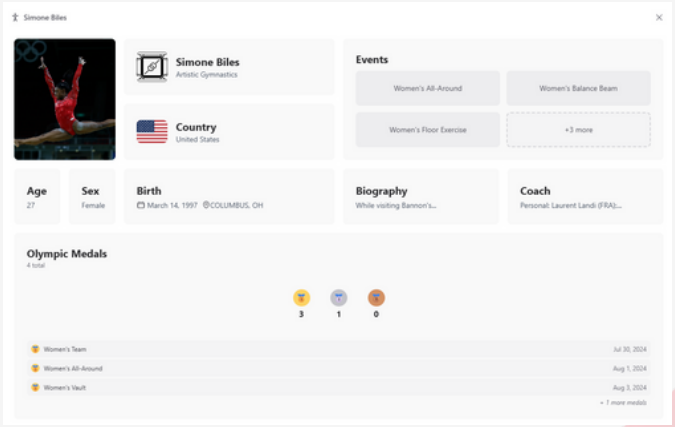


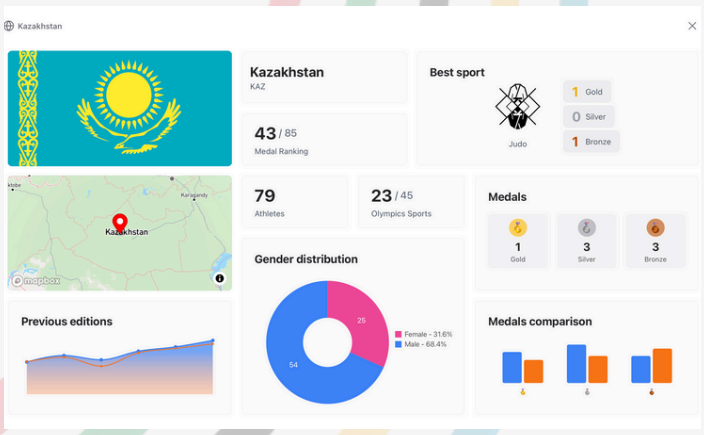




Since the dataset included the full route of the Olympic torch, from its departure in Greece all the way to Paris, we thought it would be a great opportunity to create an introductory animation. When users first open the website, they are greeted with a dynamic visualization of the torch's journey, setting the stage and atmosphere for exploring the Games.

Lastly, you may notice that each informational page is organized using a bento grid layout, creating a dashboard-like structure where users can easily find the relevant content they are looking for. We experimented with different arrangements, two examples are shown below.





Challenges and Solutions

Data Structuring and Redundancy

Handling a rich and interconnected dataset required thoughtful data modeling. Early on, our JSON files were bloated and often repeated information, for example, athletes referenced in medals, events, and schedules. Toward the end, we refactored our entire data layer to split entities cleanly (athletes, venues, sports, countries, results), relying on cross-referencing instead of duplication. This made the data easier to maintain and reduced inconsistencies across pages.

Designing Responsive D3.js Components

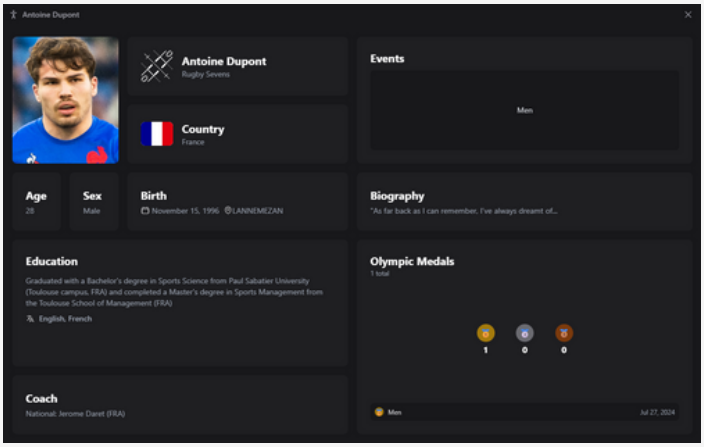
Building charts that were both interactive and readable took several iterations. For example, comparing countries' performances across sports or visualizing tournament progressions required careful layout choices and dynamic resizing. We created reusable D3.js components that adapt to different datasets and screen sizes, including interactive selectors for filtering sports or countries directly in the visualizations.

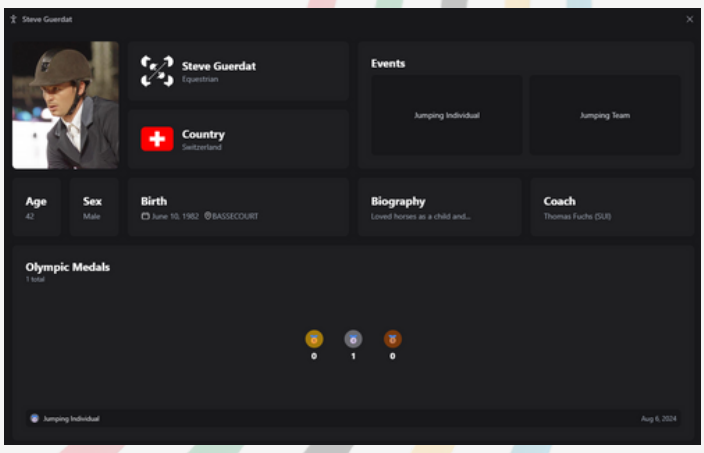
Smooth Map Integration

Making the interactive map feel natural and immersive was another challenge. Initial transitions between views were abrupt and sometimes confusing. We refined the camera animations and map controls in Mapbox to better guide the user, highlighting selected venues in 3D and syncing the view with the page content for clarity.

Adaptive UI for Variable Data

Athlete profiles vary widely, some include detailed bios, others only basic stats. This variability made it hard to design a one-size-fits-all layout. We developed a flexible "bento" card system that adapts to each athlete's available data, ensuring a clean presentation even when some elements are missing. This same logic applies to country and venue pages, which also adjust to the presence or absence of specific statistics. You can notice below that the layouts are not the same for those 2 athletes!





Enhancing Navigation Through Linking

We wanted users to feel free to explore, much like browsing Wikipedia. This meant ensuring that nearly every piece of text (athletes, flags, venues, events...) was clickable and led to another relevant page. Implementing this required careful routing and data preparation, but greatly improved the depth and flow of the user experience.

Retrieving and Validating Athlete Images

One of the more unexpected challenges was finding and displaying athlete portraits, as you can see above. Since the dataset didn't include any image links, we had to search for them online automatically. This meant designing a scraping workflow that could fetch the most likely image for each athlete, while avoiding unrelated or incorrect results. This significantly improved the visual appeal of athlete profiles, but required careful handling to avoid displaying random or undesired content!

Contributions and Conclusion

Team Collaboration

We're three close friends who see each other almost every day, so working together on this project felt natural and enjoyable. We often talked about the app informally, which helped us stay aligned and maintain a shared vision throughout the semester. This communication allowed for quick feedback loops and smooth design iterations.

Peer Assessment

Martin: Athlete, sport, & venue pages design, markers styling on the map, athlete photos fetching & classification, data handling, events page generalization to all datasets, Tournament component creation, app deployment, presentation video, website responsiveness.

Maxime: Exploratory Data Analysis, Paris venues (photos + buildings) handling, milestone 2 report writing, D3 components (GenderPieChart, AgeHistogram, EventsSunburst, MedalsRace, MedalsComparisonHistogram) creation, olympics & countries page design, process book writing.

Jean: Introduction, background map navigation and interactions with content pages, charts previews, data handling, ensuring design consistency across website, README writing, website responsiveness, many small

We're really happy with how the project turned out, especially how a 3D interactive map can display a lot of informations. We also managed to make use of every single file from the original dataset, which was a nice surprise and a sign that our design choices stayed true to the data's richness.

You can watch our screencast presentation here, and try out the live version of DataRingz here. We hope it's as fun to explore as it was to build!

by Martin Catheland, Maxime Ducourau & Jean Perbet