

DESCRIPTION OF DATA

The datasets for our project were sourced from a comprehensive F1 motor racing database, encompassing detailed information about circuits, races, race results, and drivers. Our data integration process involved three critical steps. In the first step, we combined datasets from various sources: circuit data (including geographical coordinates), race information (dates, locations), race results (positions, points), and driver profiles. This combination required careful formatting, particularly for geospatial data like latitude and longitude, and the ranking information such as the position order of drivers in each race.

In the second step, we undertook data cleaning to ensure accuracy and relevance. We removed any undefined race_ids and filtered out records where the race rank was equal to 0, thus focusing on significant race events. Once the data was cleaned and combined, we created a world map using World.GEO.JSON. This allowed us to represent the global distribution of circuits in an interactive and geographically accurate manner.

The third step involved plotting each circuit's location on the world map. We added hover functionality, enabling users to see the title of each racetrack easily. Furthermore, a click feature was integrated, whereby users can access detailed information about specific races, including race result details and the ranking positions of racers. This interactive functionality provides a comprehensive and user-friendly overview of the world of F1 motor racing, linking geographical locations with race data and driver performance.

VISUAL DESIGN RATIONALE

Map Visualization

Design Decision: For our F1 racing data visualization, we used a world map with standard projection to ensure user familiarity. The World.Geo.JSON format was chosen for accurately representing the geographical locations of F1 racing circuits globally.

Data Mapping: The map plots the circuits' geographical coordinates, providing a spatial understanding of the F1 events occurring between the years 1950-2023. This integration allows

users to visually associate the race tracks with their real-world locations.

Marks and Channels

Design Decision: We used F1-themed red circles to represent the locations of the circuits on the world map.

Rationale: The red circles provide a clear visual representation, making it easy for users to identify each circuit, which matches the F1 theme. The markers are interactive, with hover and click functionalities, enabling users to access more detailed information about each race.

Tooltip and Information Display

Design Decision: We developed a dynamic tooltip to display detailed information about drivers on hover.

Rationale: The tooltip, which appears when hovering over driver positions, provides detailed information like driver names, ranks and nationality, enhancing the depth of data exploration without cluttering the interface.

Styling and Aesthetics

Design Decision: The visualization features a monospaced font and an F1 logo for the header and a consistent color scheme, inspired by F1 colors, throughout the visualization to maintain a professional and clean aesthetic with consistent round corners and dropdown shadows.

Rationale: The visualization features a monospaced font for the header and a consistent color scheme throughout the visualization to maintain a professional and clean aesthetic, and enthrall F1 enthusiasts.

INTERACTIVE ELEMENTS AND DESIGN RATIONALE

Year Selector: This feature incorporates a dropdown menu that enables users to select a particular year. Upon making a selection, the map dynamically updates to display the races corresponding to the chosen year. The year selector is strategically positioned and accompanied by clear instructions, ensuring it is easily noticeable and user-friendly.

Race Hover & Click Interactions: When a user hovers over a race circle on the map, its border color changes, signaling the hover state. Additionally, a label appears at the top of the map, providing more details about the race's location. Selecting a circle by clicking on it keeps its

border highlighted, and the title remains visible. This interaction remains until the user hovers over or selects another circle, effectively indicating the current focus. These hover-and-click interactions align with standard web practices, making the visualization intuitive and user-friendly.

Racer Hover & Click Interaction: Clicking on a race circle maintains its highlighted state and triggers an update in a separate area of the screen, displaying detailed information about the ranking of the racers. This dynamic response to user interaction keeps the experience engaging by progressively revealing more data. Hovering over a racer circle displays a tooltip adjacent to it, with a red stroke highlighting the chosen racer, detailing the racer's name, rank, and nationality. When the year selection is changed, the racer circles reset, offering a straightforward way for users to start a new query, thus enhancing the overall user experience.

THE STORY

The visualization of F1 race tracks and rankings tells a captivating story of the exhilarating world of Formula 1 racing, brought to life through data. It's a tale not just of speed and competition but of global connections and the intricate dance of strategy and skill. As you open the visualization, the world map greets you, dotted with vibrant circles, each marking a Formula 1 circuit. Each circle, a portal to a different country, a different culture, yet all united by the adrenaline of Formula 1 racing. Hover over a circle, and a story unfolds. The name, location, and country of the racetrack appear, bridging the gap between data and narrative. You're not just seeing coordinates and names; you're glimpsing into the heart of cities like Monaco, Silverstone, or Singapore, each with its unique history and relationship with the sport.

Click on a circuit, and the story dives deeper. The visualization transitions to reveal the rankings and details of the drivers who competed there. It's here that the true drama of Formula 1 unfolds. You see legends of the sport, their positions marked not just on the track but in the annals of racing history. Each race adds a new chapter, a new set of data points that continue to build this rich narrative. The visualization not only captures the essence of Formula 1 racing but also reveals surprising elements that may not be immediately apparent to the casual observer.

One of the most striking surprises is the geographical spread and cultural diversity of the circuits. It's not just about the well-known European tracks; the visualization highlights lesser-known circuits in countries that one might not immediately associate with high-speed racing, underscoring Formula 1's truly global appeal. Another surprising aspect is the detailed data on driver rankings and race results, which sometimes overturns popular narratives. For instance, we might discover underdog stories where lesser-known drivers excel in specific circuits, challenging the dominance of established stars.

In essence, this visualization is not just a tool for presenting data; it's a narrative device that offers surprising insights and deepens the viewer's understanding of the world of Formula 1 racing. It invites viewers to look beyond the surface and explore the tapestry of stories that lie beneath.

Team Contributions

Sonia Sunil

Time Spent: Met with the group on 5th December at 10:30 AM and started working on the coding part with the team, including GitHub setting and repository control in the VS code, the entire process lasted till about 3:00 PM. It was an insightful session because both design oriented and development oriented individuals were able to brainstorm and fuse coding and visualization ideas with one another. Overall, the most time consuming part of this project included our Dec 5th meeting which lasted about 5 hours in total.

Contribution: Contributed to the main coding part of the project, including dataset processing, cleaning, and grouping, general chart area set up, scale issue fixed, dropdown menu selection, and hover over information, contributed to the brainstorming of selecting our parameters from datasets and graph types in this project.

Kellan Liu

Time Spent: Met with the group on 5th December at 10:30 AM and started working on the coding part with the team, including GitHub setting and repository control in the VS code, the entire process lasted till about 3:00 PM. It was an insightful session because both design oriented and development oriented individuals were able to brainstorm and fuse coding and visualization ideas with one another. Overall, the most time consuming part of this project included our Dec 5th meeting which lasted about 5 hours in total.

Contribution: Contributed to the main coding part of the project, including general chart area set up, scale issue fixed, dropdown menu selection, and hover over information, contributed to the brainstorming of selecting our parameters from datasets and graph types in this project.

Jinmo Huang

Time Spent: Met with the group on 5th December at 10:30 AM and started working on the coding part with the team, including GitHub setting and repository control in the VS code, the

entire process lasted till about 3:00 PM. It was an insightful session because both design oriented and development oriented individuals were able to brainstorm and fuse coding and visualization ideas with one another. Overall, the most time consuming part of this project included our Dec 5th meeting which lasted about 5 hours in total.

Contribution: Contributed to the frontend coding part of the project, including HTML and CSS setup, designing and coding different circle states, and interaction fixes, contributed to the brainstorming and research phase of the project, and wrote the report for the project, with co-designer and writer, Bandar Qadan.

Bandar Qadan

Time Spent: Met with the group on 5th December at 10:30 AM and brainstormed directions on what we want to convey and what dataset will we use to convey it. Then worked on the design direction with the team, including choosing color elements and icons, elaborating on the story to be told and how to leverage it in our visualization, and researched existing visualizations on F1 for inspiration. This entire process took place between both the development team and the design team. The entire process lasted till about 3:00 PM. Overall, the most time consuming part of this project included our Dec 5th meeting which lasted about 5 hours in total.

Contribution: Brainstormed and discussed which datasets to use; researched existing visualizations on F1 racing for inspiration and overall direction; discussed with the development team on design direction; wrote the report for the project, with co-designer and writer, Jinmo Huang.