

CS498: Data Visualization

Narrative Visualization Project

Thomas Wright, tgw4@illinois.edu

Messaging

The message that is being communicated is the difference in mileage between cars, especially focusing on their engine types (gasoline, diesel, electric). The narrative starts with the lowest mileage group and proceeds toward the highest mileage group, concluding with the message that electric cars have far better mileage than any other types.

Narrative Structure

The narrative visualization follows the “martini glass” structure. It does this by only allowing the user to step forward through the first 4 scenes in a linear fashion with no branching or exploration opportunities. In the final scene, it is opened up to allow the user to explore and drill down into the data on individual data points however they wish.

Visual Structure.

The same basic graph structure was used in each scene. This allows the format to stay consistent and it will be easier for the user to keep their orientation between scenes. The explanatory text annotations and navigation controls stay in the same places from scene to scene to also allow the viewer to keep oriented and always know where the controls are.

Regarding highlighting to help the viewer focus, the first introductory scene has all of the data points colored a neutral gray so as to not draw too much attention to the data yet. This allows them to focus on the text that explains what the graph is about, and the instructions on how to navigate. Then in the next scene, the graph circles for the engine choice in question (gasoline) are colored blue while the other circles are colored an even lighter gray than the introductory scene. This draws the viewer’s focus to the blue gasoline engine data points, but keeps the other dots in sight, so the viewer can still see how the blue ones stack up relative to the other data points. This highlighting of the engine type follows similarly for the next two scenes, with the type in question highlighted in color, and others changed to a light gray. In the final scene, the dots are all colored to their respective engine types, as this scene is for the viewer to explore the details on each data point as they wish, and not have one highlighted over the other.

Another example of highlighting is shown by the legend that explains which color belongs to each engine type that appears in the second scene and onward. The new color for the scene is highlighted in bold, while any previously introduced colors are set to an opacity of 0.25, so they appear light gray. This highlights the one that is the focus in the scene. Once we get to

the final scene, they are all set to an opacity of 1, and an equal normal font weight, as all of the engine types are being equally focused on there.

By keeping all of the data on the graphs for all engine types on the chart in each scene, but making it light gray when focusing on other types, this helps the viewer both transition between scenes without losing their orientation on the graph, and makes it easier to see how all the data connects and how the engine type that is being focused on measures relative to the other engine types.

Scenes.

There are five scenes, starting with an introductory scene, followed by three scenes that each focus on a different engine type, and a final scene that allows free exploration of the data for all engine types.

They are ordered so that the viewer gets the introduction first which explains what the chart is about, and how to navigate the scenes. This needs to come first to help the viewer understand the narration and how to navigate. Then the next scenes are ordered from worst mileage (gasoline) to middle mileage (diesel) to best mileage (electric). They are ordered from best to worst so that the viewer sees things getting better and better as the scenes progress, with electric being last, so the last impression on the viewer is that electric cars have far better mileage than any others. The final scene allows the user to free explore the details on the data for each car. This is last as the point has already been made that electric cars have the best mileage, and it's time to let the viewer reinforce that for himself by looking at and comparing all of the data points they wish.

Annotations.

The template for the annotations was to always keep them in the same text area on the right-center part of the chart. Each scene keeps the same text zones, and just replaces the content of the text when the scene changes. This keeps the look and feel very consistent from scene to scene. These annotations explain what the message is showing in each scene, and how to navigate the scenes.

The text annotations don't change within a single scene, the only thing that changes within a single scene are the tooltips in the final scene that change when the mouse moves on or off a datapoint.

Parameters.

The parameters which are used are the engine type which is the focus of each scene, and a state counter variable which is used to keep track of which scene we are in, and to tell the script what to change when moving to a new scene. The five values of the engine type

parameter are 'start', 'gas', 'diesel', 'electric', and 'all', these correspond to the state counter values of 0 to 4 respectively. As they increment from first to last, this tells the script to change the annotation text, data point colors, and 'Color Key' legend text to the appropriate values for the next scene. It also changes the text in the title at the top of the graph. Finally, it triggers the removal of the "Next" navigation button in the final scene, since there is nothing "next" after that scene, and we don't want to leave the button there to confuse the viewer.

Triggers.

The triggers that change the scenes are the "Next" and "Restart" buttons in the lower right part of the graph. The "Next" button advances the scene to the next one in the sequence until the last scene (where the button is removed as it is no longer useful). The "Restart" button allows the viewer to go back to the beginning of the narrative at any time they wish.

The labeling of "Next" and "Restart" on the buttons should help the viewer understand how they will allow them to navigate the narrative, plus the text on the right side of the graph above the buttons also explains how to use them to navigate.

The other trigger that causes changes in the narrative are the mouseover events, that show the tooltips with car details when the viewer moves the mouse over a datapoint, and then removes it (by setting opacity to zero) when the viewer moves the mouse away. This is explained in the text along the right side of the graph in the final scene (the only scene where the tooltips are active).