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Introduction to Information Visualization

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P5 Description

Chosen Dataset:

Aircraft Incidents

Supported Analytic Tasks:

- Overview
- Zoom
- Filter
- Details on Demand
- Find Extremum
- Tell a story

Design Overview

Our visualization focuses on the injuries that result from aircraft incidents and prioritizes Shneiderman's mantra in regards to the analytical tasks it allows for. When first viewing the page, the user is shown an overview of the data in the form of a short paragraph that describes what the data is about and then the overall fatal and serious injuries that resulted from any incident. These totals are separated based on airline make. The user can then click on any of the flight phase buttons to zoom down to an appropriate level on the graph and view the filtered results for that flight phase. The buttons are always available for the user to switch between overview or flight phases at any time, giving them details on demand. Due to the nature of the data, the extremum for the flight phases are easily found in the graph.

Lastly, the reason we chose this dataset was because we wanted to try to tell a story, specifically around the life of a flight in an aircraft. This was how we decided which phases to showcase for user selection. They appear in the order that a flyer would experience them on a

regular flight. A user can click through the visualization and see which incidents are more lethal or not in regard to the maker of the aircraft. More storytelling elements and explanations are included in the text descriptions with the visualization.

AIRLINE INCIDENTS

Aircraft Incidents. Nearly everyone who has flown on an aircraft has, at some point or another, experienced fear. What if something bad happens? What if the plane crashes? What if we fly into a storm? Most of us, after flying a few times, get over these fears and learn to put them aside - until we see an accident on the news. Most recently, in March 2019, Ethiopian Airlines Flight 302 crashed just minutes after takeoff, killing all 157 passengers. But is this kind of scenario common? How many deaths have been caused by airline crashes, and what has caused them? Using data from hundreds of aviation incidents over many years, we tell the story below.

Figure 1: introductory blurb

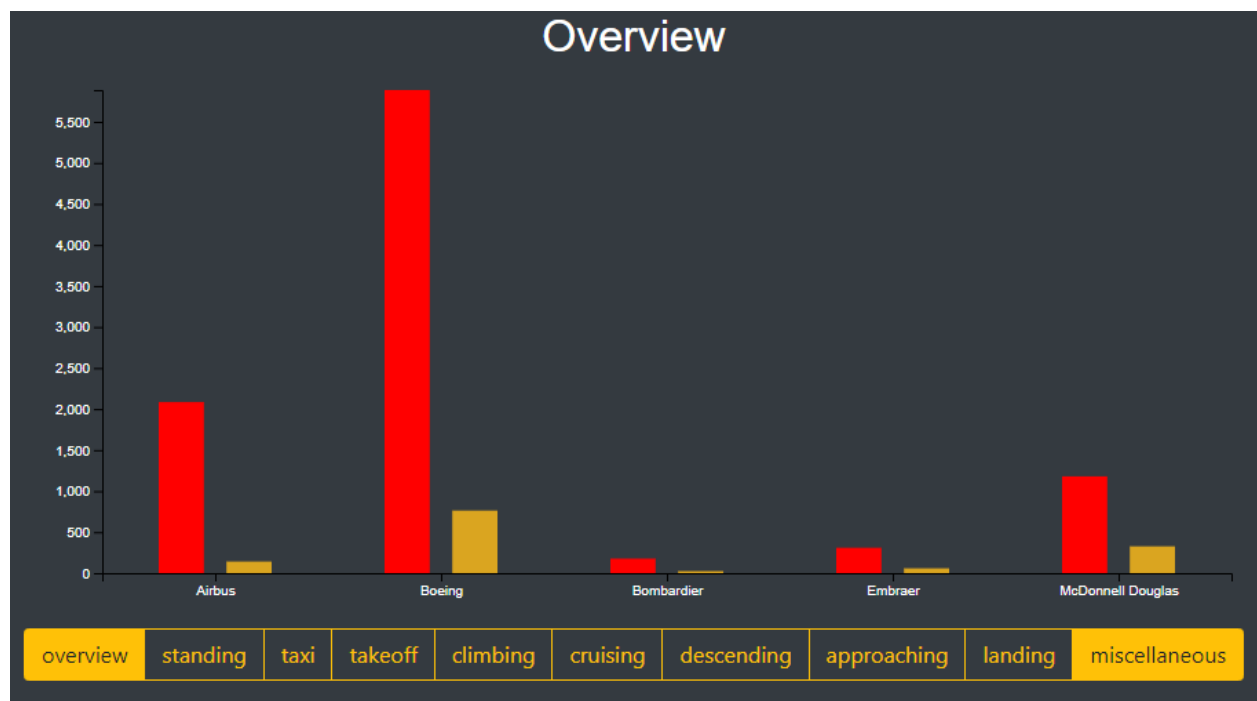


Figure 2: Original Overview

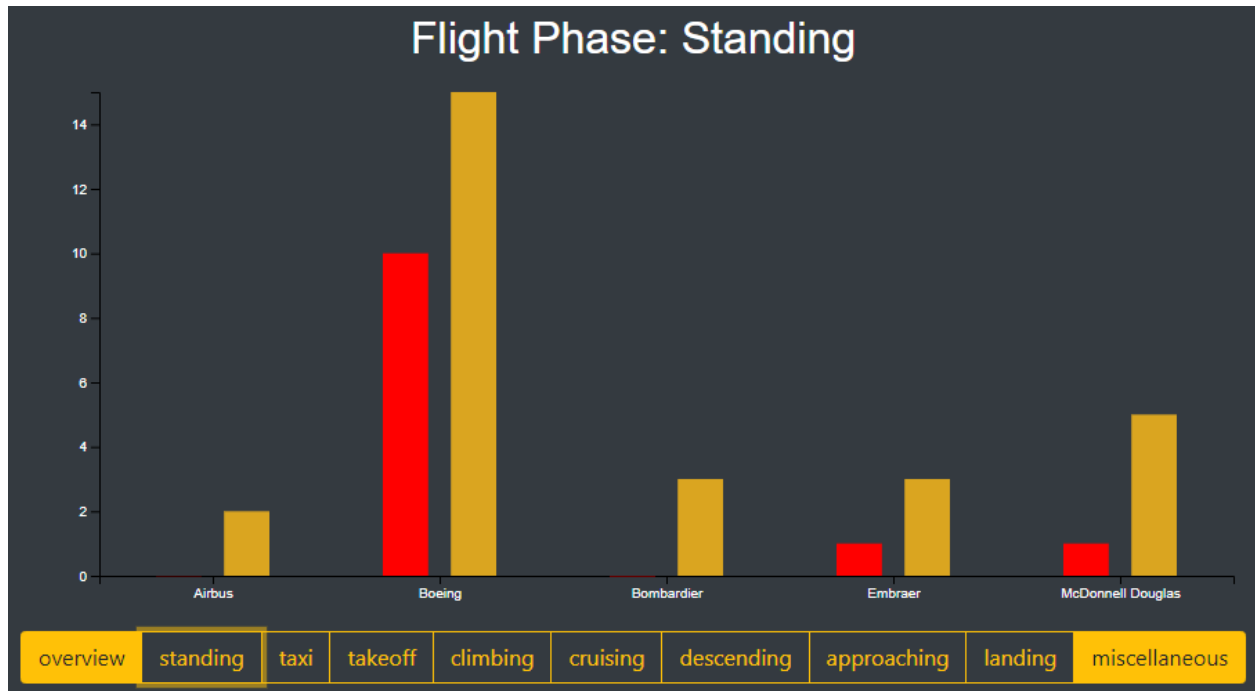


Figure 3: View for Standing Phase with change in y axis

overview
standing
taxi
takeoff
climbing
cruising
descending
approaching
landing
miscellaneous

The strongest trends that we noticed while exploring the data were the relationships between number of injuries/fatalities and the manufacturer of the aircraft. In this first chart, we present an overview, a view of how many total accidents have been reported per aircraft manufacturer. The red bars represent number of fatalities, and the yellow bars represent serious injuries. One thing to keep in mind here is that these results DO NOT indicate that Boeing aircraft have a higher RATE of accidents than the other manufacturer's products. Rather, there are simply more aircraft that have been produced by Boeing than those produced by other manufacturers.

Figure 4: Example data exploration blurb

Extra Explanation:

We didn't realize until it was too late to change that the data doesn't lend itself well to the story we were trying to tell. The majority of the injury data lies within data cases that don't have a phase of flight recorded for the incident. This led to a large discrepancy between the "overview" and "miscellaneous" sections and the rest of the flight phases. In order to accommodate for this, we created a dynamic y axis. This axis adjusts itself to the largest number in the 5 cases it is showing for that flight phase. The animation of the axis helps to show users

that the significance of the bar height has changed, and this dynamic axis allows for easier comparison between values as the bars are viewed relative to each other. The dynamic bar also helps in the sense that it provides a zooming sensation when viewing filtered data.