

P5: Putting it All Together Description

Team Members: Lindsey Stowell, Brooke White

Dataset Chosen: Aircraft Incidents

List of Analytic Tasks Supported by Assignment:

- Low Level:
 - Retrieve Value (can find attributes of specific cases such as year of accident, can retrieve details on demand for data point)
 - Find Extremum (can identify extreme values from visualizations)
 - Determine Range (can identify span of values within the visuals)
 - Find anomalies (can identify outliers in data from visuals)
- High Level:
 - Seek/Elaborate/Question/Preserve/Compare a frame based on the data visualizations displayed
 - Exploit the information (can recognize patterns in the data)
- Interaction Based:
 - Select (can select a data point to highlight the corresponding one in the other graph on the bubble visualization, can scroll over a point to see details on demand)
 - Explore (direct walk through different visualizations showing linkages between cases)
 - Abstract/Elaborate (can scroll over point to get details on demand or just look at visualization as an overview)
 - Connect (can click on one data point to see same point in other graph on bubble visualizations)

Design Overview:

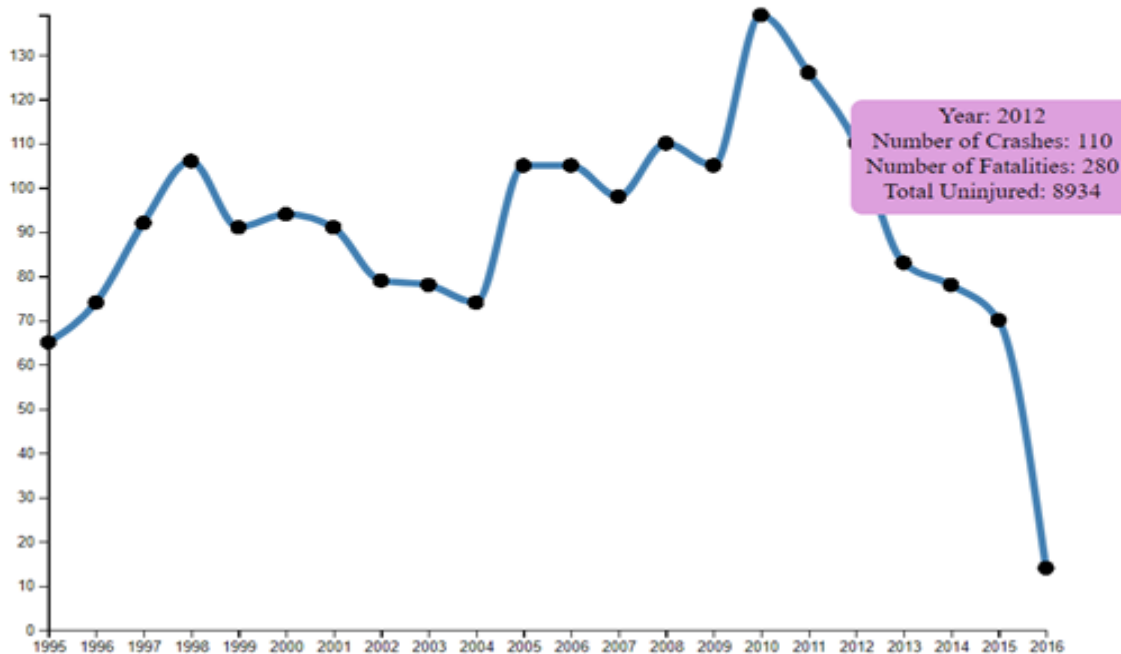
Our project includes three different visualizations with two other transitions that highlight essential elements of the first graph. We aimed to manipulate our information displays primarily for browsing data in order to find patterns and relationships in the data rather than searching for specific answers to predetermined questions. As such, each visualization gives an overview of the data surrounding airplane incidents from 1995 to 2016 by focusing on the distribution of certain attributes through the years. The intention of our project is to provide the user with a story to follow surrounding the data. Each visualization includes relevant information and key points in the text above it. When the user is finished with one page, they can advance to the next visual using the “Next” button or return to a past visual by clicking the “Previous” button.

First, a line graph showing the number of crashes per year is displayed. This is meant to provide an overview of the data and give context for later relationships. You can mouse over a

specific data point to get details on demand about it and answer any questions you may have about a given year.

Next

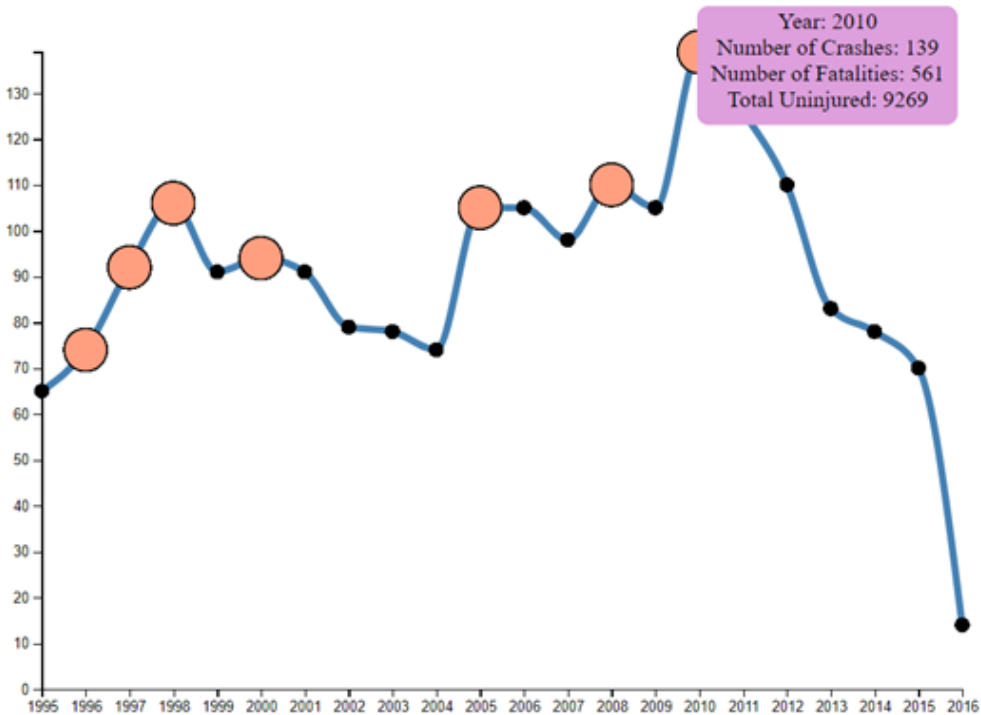
Ever since the Wright brothers decided to take the world into the skies in the early 1900s, aviation has been a major industry and each year companies work to develop new components designed to improve the experience of flying. Unfortunately, a lot of devastating failure. To help better understand the distribution of airplane related accidents over the years, below is a graph over time. As you can see, there are many peaks and valleys in the number of reported incidents over the years. Click “Ne



If you hit the “Next” button, the graph transitions to highlight the data points that increase in the number of crashes from the previous year. The graph shows the distribution of increases over the given years. This is designed to answer questions such as “Which year had the most plane accidents compared to the year before it?” and “Which year had the most plane accidents overall?”. You can mouse over any point to get details on demand about the point and keypoints from the data can be seen in the text above the graph.

[Previous](#)[Next](#)

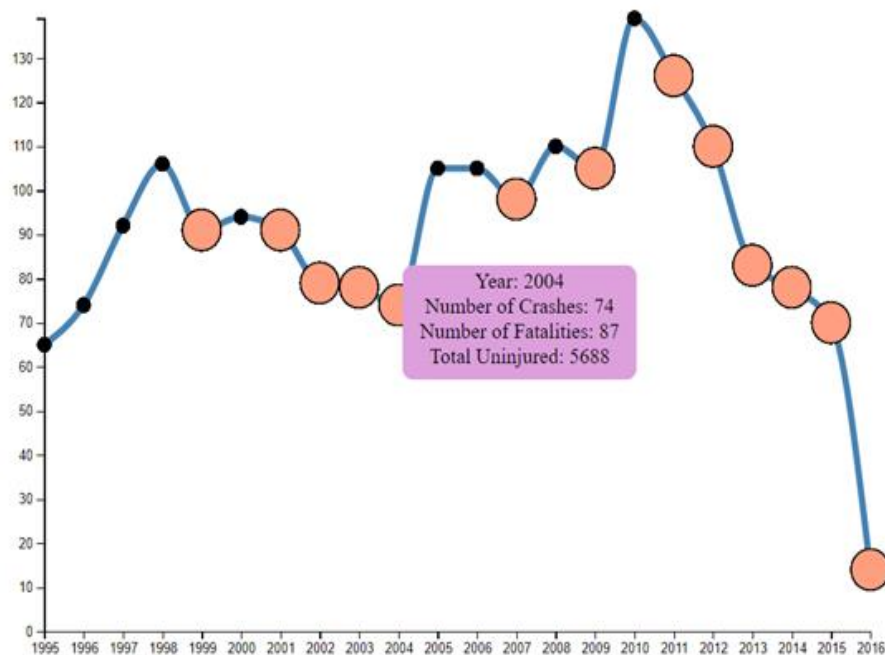
First, let's look at the intervals where the number of reported airplane related incidents increases from the past year. On the whole, most being gradual increases, however 2004-2005 and 2009-2010 stand out in particular as they feature the most drastic increases and the year with the most amount of accidents overall is 2010. One would think that the number of accidents could be because modern communication and record-keeping is far superior to that in the past which enables more records of accidents that resulted in high fatalities. We will examine this more later. Another possible explanation is the public's concern for passengers and goods across the country could result in more accidents.



Next is a very similar graph with only the decreases in number of crashes from the previous year highlighted. This graph aims to answer similar questions as the previous one, except dealing with decreases in accidents and having the least amount of plane incidents. As it operates in the same way as the previous visual, you can also get details on demand from hovering over a particular point.

[Previous](#)[Next](#)

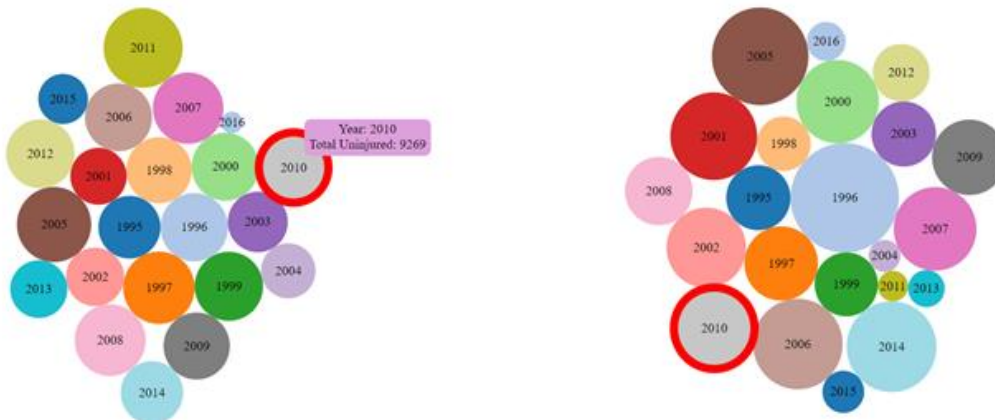
In this graph the declines in reports from year to year are highlighted. Unlike the increases in reports that typically a steady declines over multiple years. The most drastic decrease is obviously from 2015 to 2016 with a difference of 5 year 2016 has the fewest reports out of all the data. As this year was the last point following a downward trend starti safety requirements, or new technology.



The visualization technique that appears next are two bubble distributions, one showing years with the most fatalities and one showing years with the most uninjured. You can click on one year's circle in one visual to see the corresponding year's circle in the other. Scrolling over data points on either graph results in details on demand for that particular year. This visualization is meant to allow comparison of results of the accidents concerning the people aboard. Users can answer questions such as "Is there a connection between years with more accidents and the number of fatalities versus uninjured?" or "Which year had the most accident-related fatalities?". Patterns between the number of fatalities, the number of uninjured, and the number of accidents reported can be interpreted through analysis of this visualization combined with information from the earlier ones.

[Previous](#)[Next](#)

In order to better visualize the differences in total fatalities versus total uninjured per year, these bubble clusters display each attribute in an easily comparable way. To the left, you can see the number of fatalities each year which is shown by the size of the bubble. The years in large bubbles had the most fatalities while those in the smaller ones had few. The right visual operates in a similar way, however, it depicts total uninjured per year. You can click on the colorful part of each bubble to highlight that year's data in both visualizations so the reported fatalities versus uninjured for that year can be compared. Recall that 2011 has the most reports of incidents over all the years. If you select the associated bubble, you can see that there were substantially fewer fatalities than uninjured. This implies that although there were more accidents that year, most were minor and resulted in a relatively safe return to ground. It can also be observed from these visualizations that 2016 had the least amount of uninjured of all the years, however this could be attributed to it having the fewest accident reports which we learned from the previous graph.



The final visualization is a area graph featuring two lines: accidents reported that resulted in minor damage and those reported severe. The coloring underneath the lines helps users understand the differences in numbers between the two lines. This design technique is meant to help users analyze relationships between the number of minor incidents versus severe accidents. It addresses questions such as “Which year had the most airplane accidents that resulted in major damage” or “Do years with high fatalities have more severe incident reports?”. Just like with the previous graphs, a user can scroll over particular data points to view details on demand.

[Previous](#)

This final graph provides a way to compare the number of accidents that resulted in a destroyed aircraft versus the damage while the lower red line shows the number of accidents that led to the complete destruction of the plane. It comes as no surprise that the year 2016 has the least amount of reports of both minor and severe damage. This relationship could be attributed to the fact that most reports that are primarily showing the instances of minor damage as they would have the most number

