



Utah Accident Visualization

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Basic Info

Project Title: Utah Accident Visualization

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Project Repository: <https://github.com/eric-sims/MTG-winrate-visualization>

Background and Motivation

It seems to be a common conversation topic of how terrible “Utah Drivers” are. How true is that? We believe that Utah roads are plagued with people going too fast, running red lights, disobeying traffic laws or being just plain ignorant of their surroundings on the road. We think it is worth considering looking at the accidents that have happened in Utah in a given year to determine what are the most common types of crashes and when and where they tend to happen.

We have heard that it is best to avoid the roads at night, but is that true? When do most DUI's happen? Are teenage-involved accidents more common in urban areas than rural areas? Do elderly drivers become more involved in accidents during times of inclement weather?

Project Objectives

With this data visualization we are trying to answer many questions about driving and accidents in Utah in general, but specifically we want to show the correlation between different types of accidents, when they are likely to happen and what the causes of them are. With this data law enforcement will be able to better predict optimal times to be watching the streets and citizens using the Utah roadways will be more prepared and aware of potentially dangerous times to be on the road and locations with higher than average accident rates.

Data

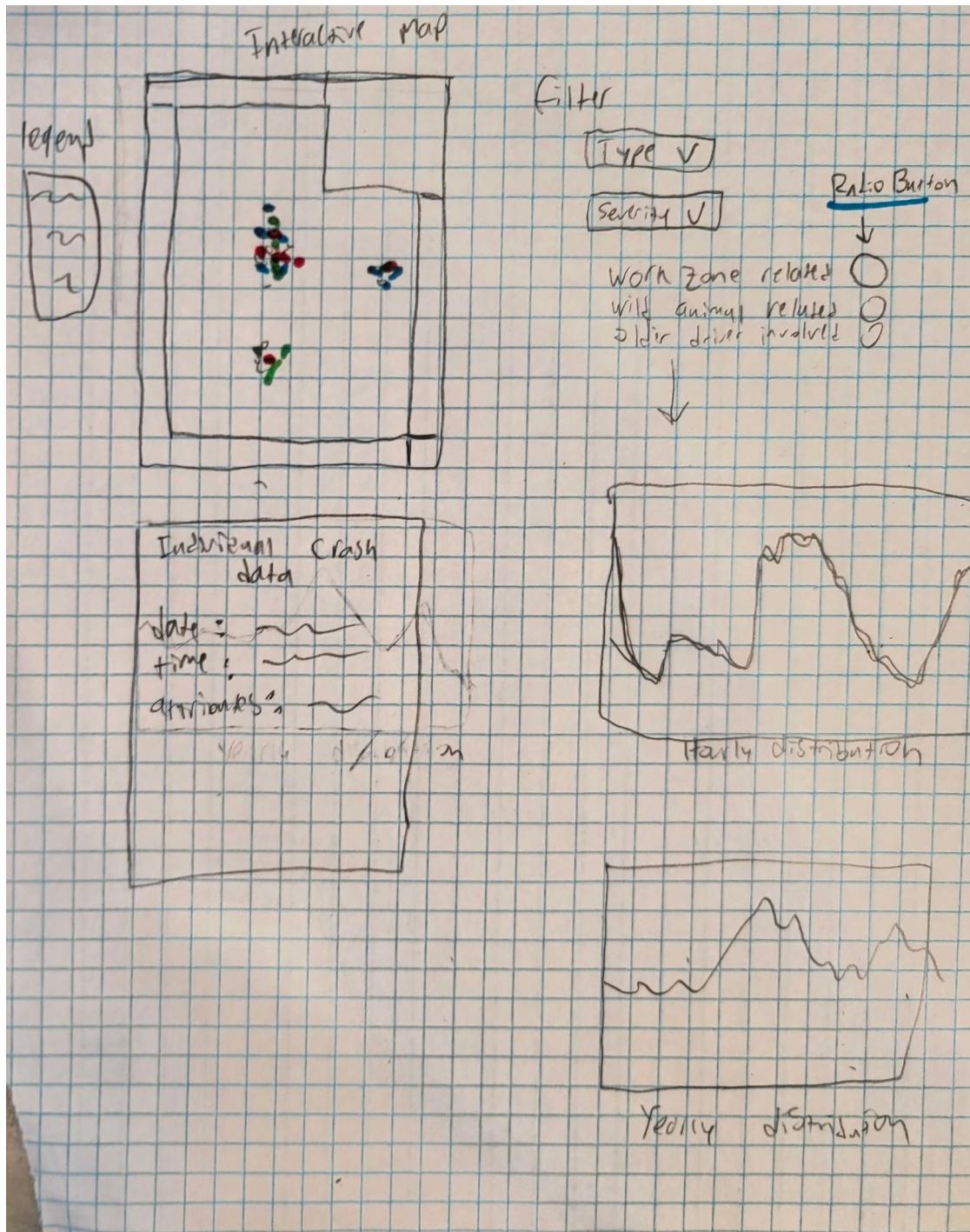
We will be using data on Utah Car accidents for the year 2020 obtained from The Crash Studies Team at UDOT's Traffic & Safety Division provided through Socrata at <https://dev.socrata.com/foundry/opendata.utah.gov/herb-zqda>

Data Processing

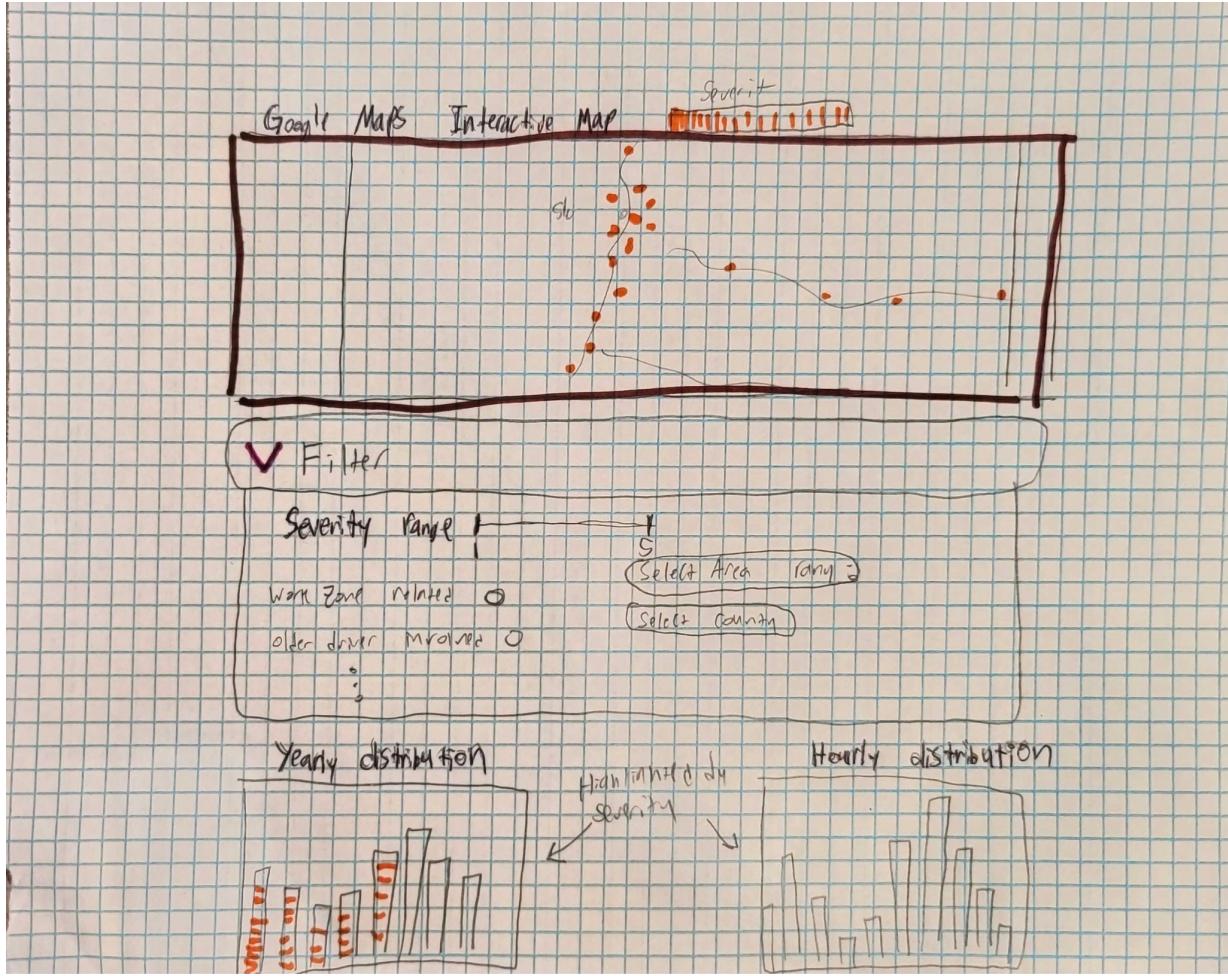
This data is already in a json format and contains very little unnecessary data for our purposes. We expect to do very little data cleanup and should be able to directly implement this data into our visualizations. We will also be deriving from this data the relationship between various aspects of the accidents like what percent of accidents involving teenage drivers also involve driving under the influence.

Visualization Design

We knew that we wanted to have a few key features in our visualization. First, we wanted to have an interactive map that plots where the crashes have been. We also wanted a filtering area that users could focus on certain types of crashes. Furthermore, we wanted a detailed page for a selected crash and finally we wanted bar charts showing the most common times that crashes tend to occur.



Prototype #1 - This was a pretty good home run of what our final design is. Although it did not consider a data derivation.

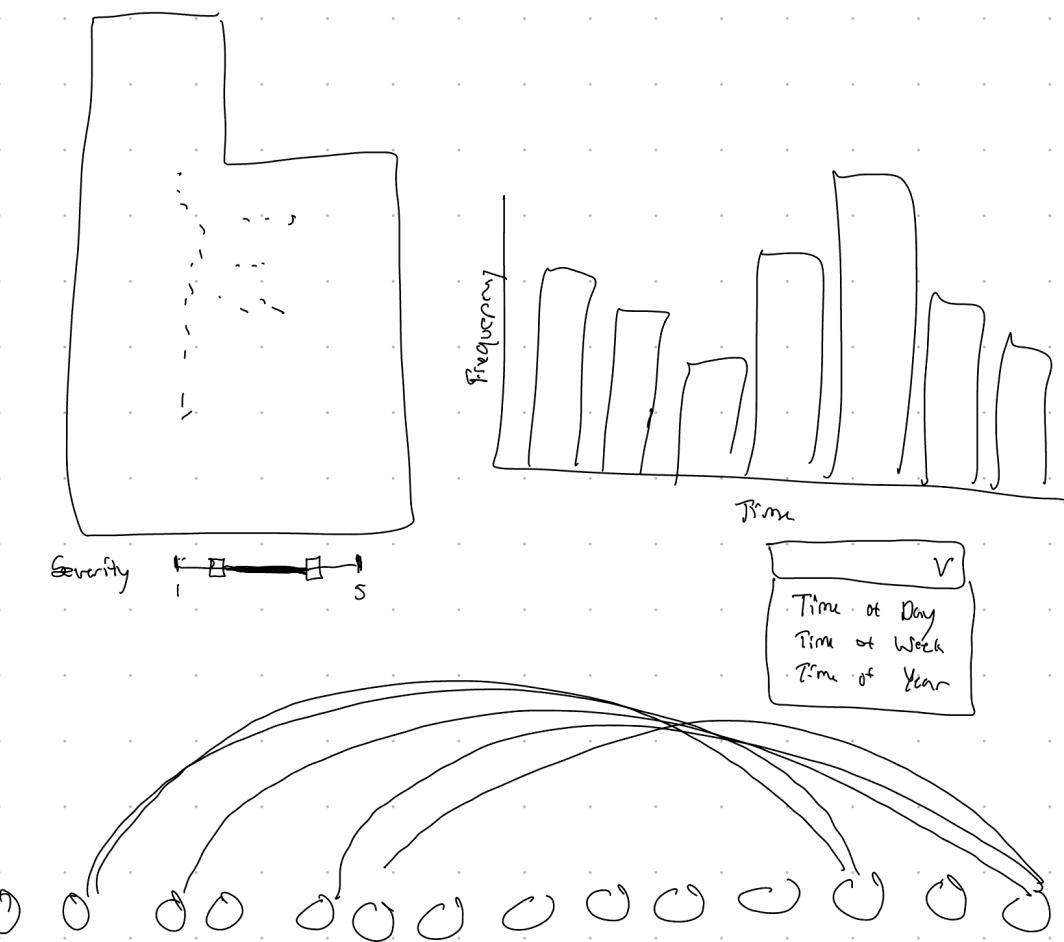


Prototype #2 - Experimenting with using a severity scale on the map to differentiate the accident plots

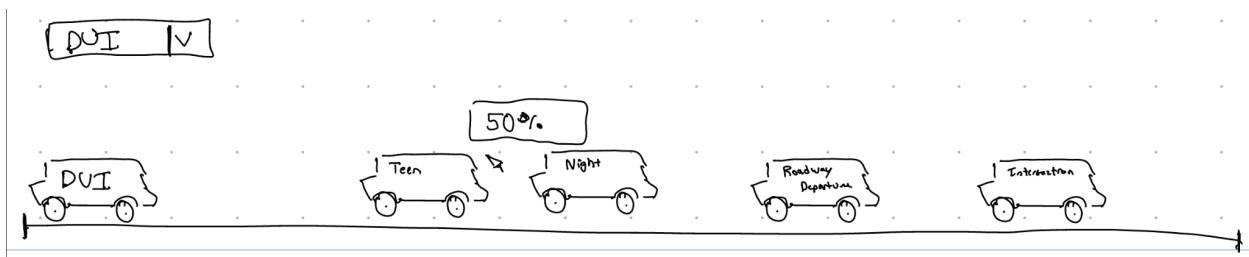
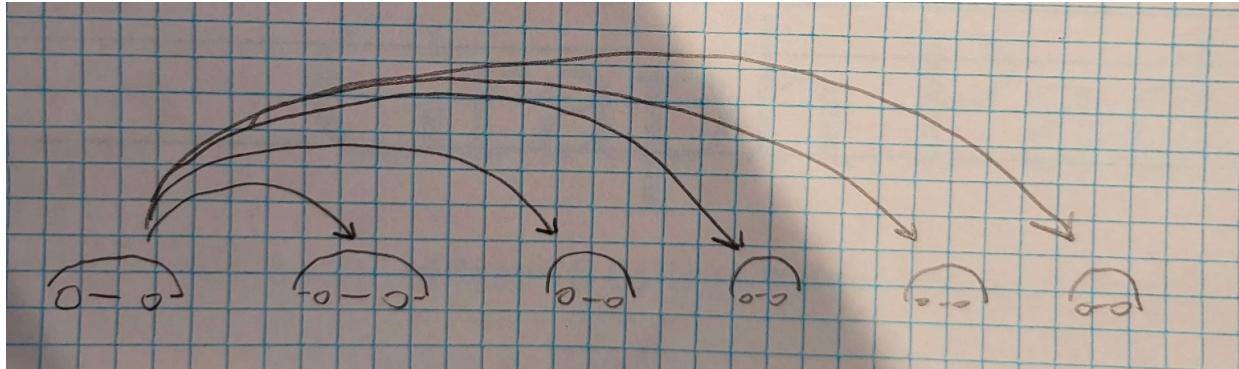
F14t3

DUI X

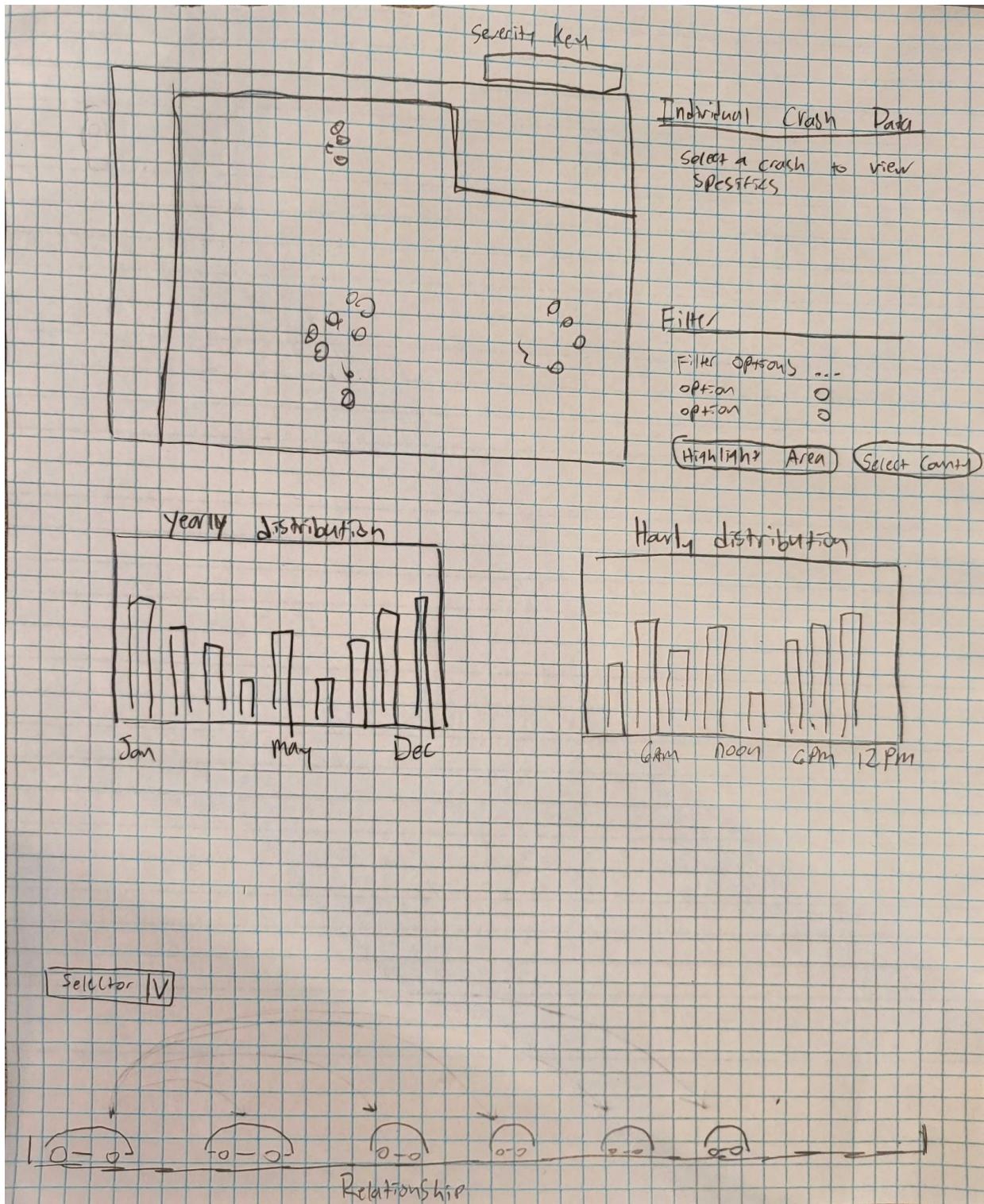
Traffic X



Prototype #3 - General layout design being finalized, brainstorm idea of data derivation



Required Feature 5 prototyping: Relationship Correlations, mouse hover to show percentage correlation between selected feature



Final Design- relationship correlation display at bottom, $\frac{2}{3}$ screen interactive Google map with overlaid accident data and individual crash data and filter options next to it and above Yearly and hourly distribution plots.

Must-Have Features

List the features without which you would consider your project to be a failure.

1. Interactive Map
The most critical part of the project will be an interactive map with dots at the locations of the crash. The dots will have a certain darkness of color based on the severity of an accident (which is between 1 and 5).
2. Filter Section
Each crash has fields of data indicating whether or not the crash had a certain characteristic. These are attributes like “DUI” or “Wearing Restraints”. That could give more insights when focused specifically on these things. A user will also be able to filter the severity of a crash.
3. Year Timeline Distribution
This distribution will be a bar chart (separated by weeks) of the frequency of accidents of a certain season of the year.
4. Time of Day Distribution
This distribution will be a bar chart (separated by hours) of the frequency of accidents of a certain time of day.
5. Relationship Correlation
A user will be able to select an aspect of accidents that happen in Utah like teen driving involved, or driving under the influence and see the correlation with other aspects. The other aspects of accidents will arrange themselves percentage frequency of happening together and highlighting other values will display their exact correlation (as seen in images above)

Optional Features

1. County Filter
On the click of a button, you will be able to select particular Utah counties and filter the data based on accidents that happened in that county specifically.
2. Highlight Area Filter
Ability to highlight, circle or otherwise draw and filter based on a highlighted region of the map and only display accidents that happened within that area.

Project Schedule

| Feature | Due Date |
|---|-------------|
| (Project Proposal DUE) | 21 October |
| Data downloaded and organized as an object in javascript, code structure prototyped | 28 October |
| Skeleton of web page put together, map is drawn and shows plots, filter section in beta | 4 November |
| (PROJECT MILESTONE DUE) Both distribution plots shown, selecting accident on map displays individual data and relationship correlation visual in beta | 11 November |
| Filter section completed and working | 18 November |
| Final Bug fixes and project video, plus optional requirements time permitting. | 25 November |
| (FINAL PROJECT DUE) Webpage meets all project requirements | 2 December |