CS6630/5630 Final Project Proposal - Missing Migrants

- **Basic Info:**

    project title: Missing Migrants

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- **Background and Motivation:**

    Migration has always been an important issue, especially in recent years. For the majority of refugees and asylum-seekers, they are often willing to take risk to choose remote or difficult routes to avoid detection. Thus, most deaths stemmed from the irregular nature of migratory journeys. Countless bodies were never discovered and the officials were rarely aware of these incidents, resulting in severe psychological trauma to the people who lost their loved one since there could never be a closure for them.

    Our project motivation is to raise public awareness of the risky migration routes and the deaths that they have caused. We hope, by this visualization project, we can help reduce the number of migration routes being taken and thus reduce the number of missing or death counts.

- **Project Objectives**

1. Highlight risky migration routes

2. Categorize the cause of death by taking the risky routes

3. Analyze the most popular migration destinations

4. Does the nationality relate to the rate of death or disappearance

- **Data**

    Kaggle: Missing Migrants Dataset
    https://www.kaggle.com/jmataya/missingmigrants/download

- **Data Processing**

    The original data set contains the following keys:

1. **ID**:   unique key documenting incident

2. **Cause of Death**:   reason for death

3. **Region of Origin**

4. **Nationality**

5. **Missing Persons**: counts

6. **Dead**:   counts of deaths

7. **Incident Region**: region where incident was recorded

8. **Date**:   the date when the incident was recorded. Note the data set includes records from 2014 to June 2017
9. **Latitude**:   spatial coordinates

10. **Longitude**:   spatial coordinates

We do not use all of the original keys. Instead, the ones we use are rearranged as the following:
```
{
    cause: "Presumed drowning",
    origin: "Middle East",
    nationality: "Iraq",
    missing: 1
    dead: 4
    incident_region: "Mediterranean",
    lat: 36.89,
    lon: 27.28
}
```

- **Visualization Design**

In our visualization design, we decide to use 3 different type of representations to visualize our data. In Figure 1, we display the origin of the migration route and the incident location of the migrants who went missing or found dead on a world map. Through this visualization, users will be able to see the patterns of dangerous routes being taken. The number of routes can be adjusted for precise selection.

Migration Incident Map View
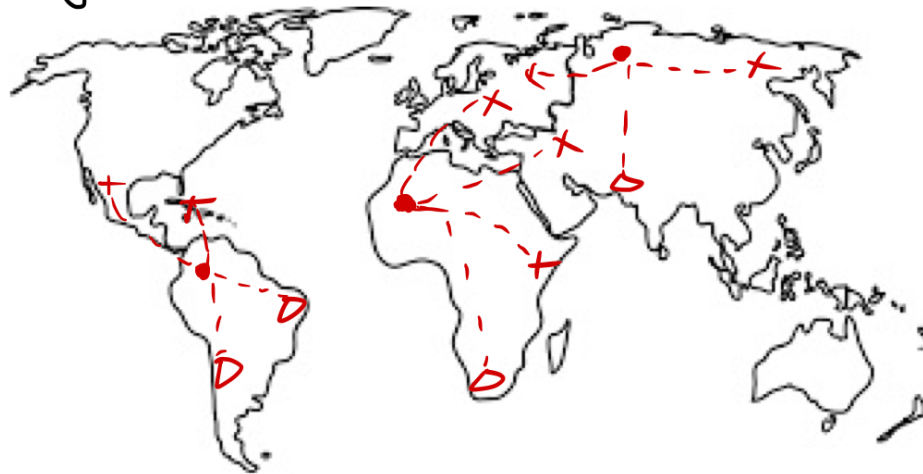
- **•** — Migration Origin
- **X** — Incident Location (death)
- **△** — Incident Location (missing)
- **- - - -** — Migration Route

Figure 1. Migration Incident Map View

Upon clicking/hovering the area on the map or migrate routes, the pie chart in Figure 2 will be updated to reflect the weighted percentage of cause of the death and the nationality of the affected individuals. There will be two pie charts in total. Each is responsible for displaying the cause of death and nationality percentage.
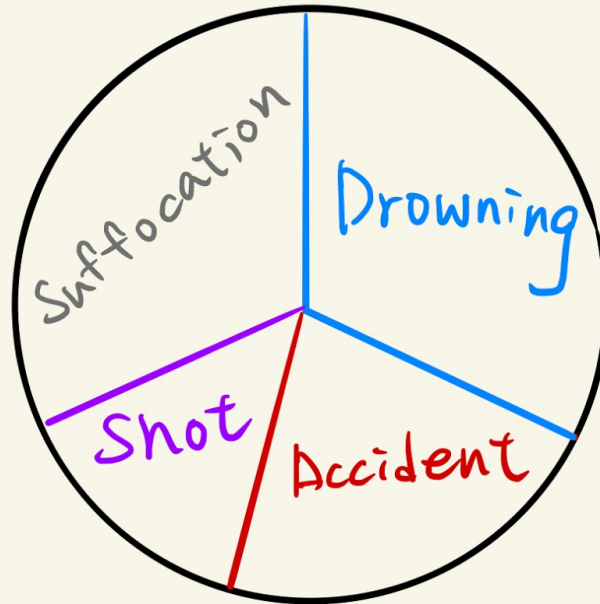
Figure 2. Cause of Death Distribution

Finally, in our 3rd visualization as shown in Figure 3, an overall ranking for the following categories are displayed:

1. Nationality of the affected individuals

2. Death count

3. Missing count

4. Incident region

5. Cause of death

Each category title can be used to perform sorting in ascending or descending order. In addition, each data row is expandable to further display an data entry that details the specifics of the incident report. This is the most important visualization as it details the ranking of the most affected area and the total count of death/ missing as well as the report for the individual incident. It allows the users to quickly find which incident region is the most dangerous one.

Figure 3. Ranking Table

- **Must-Have Features**

6. Click:

    1. Click on migration route as shown in figure 1:

        1. <chart> show ratio of cause of death in pie chart

2. <text> show amount of death/missing

2. Click on region as shown in the figure 1:

1. <chart> show ratio of top 5 nationality that death/missing in the region in pie chart

3. Click on header in the ranking table shown in figure 3:

1. Update the whole table based on the selected header (ascending/ descending order)

7. Link two charts:

1. Click on region in the world map and highlight the corresponding rows in the ranking table for which incident region equal to the selected region

3. Dropdown:

1. By clicking on the nationality in the ranking table, dropdown and show each data of death/missing/incident region/cause of death that come up to the selected nationality.

- **Optional Features**

4. Scroll bar: Shows the migration routes with top 50 missing/death by default, and let the user scroll the number of routes to show

5. Migration route animation: Creates an animation for each individual route that shows the migration pattern.

- **Project Schedule**

    Week 1(10/3): Project topic discussing
                - S386: H1B/Green card issue
                    - Collecting data
                            - Visualization design
                            - Motivation and background discussion

    Week 2: Project topic discussing
            - World missing migrants:
                    - Collecting data
                            - Motivation and background discussion
                            - Project objectives confirm
                            - Visualization design (draft)

    Week 3 (Project Proposal Deadline 10/25): World missing migrants
                - Visualization design
                - Project proposal finished

    Week 4: Implementation
            - Word map with migration route implementation
            - Ranking table implementation
            - Process book start

Week 5 (Project Milestone Deadline 11/08):

- Process book contine

- Code organize

- Create release in Github

Week 6: Implementation

- Process book contine

- Pie chart interaction

- Mouse events and data interation

- Optional feature confirm

Week 7: Implementation finish

- Process book almost finish

- Code and design adjustment

Week 8: Prepare for final submission

- two-minute screen-cast with narration video

- Code and design adjustment

- Project website

Week 9 (Final Project Deadline 11/27):

- Integrated the works

- Peer assessment