



Knight Foundation
School of Computing
and Information Sciences

Knight Foundation School of Computing and Information Sciences

Summer 2022 Senior Design Project

Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

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PROBLEM

Misinformation has a great impact on the public since people are obtaining their information mostly from social media and other online sources. Navigating this chaotic space is overwhelming. People unknowingly spread information from these questionable sources, magnifying the problem. One of the most concerning areas of misinformation is climate change.

In order to shed light on the issue, our team has compiled engagement data related to climate news articles from Newswhip. Using this data we are able to analyze trends and point out topics of concern.

CURRENT SYSTEM

The monitoring and mitigating information project aims to spread awareness about climate misinformation and the public perception of climate related issues.

User's can focus on multiple sources and filter the data according to their needs. This data could be filtered by engagement type, publication date, and top articles. That data can then be analyzed using pie charts, histograms, bubble charts and line graphs. We used BERTopic to cluster the data into meaningful groups allowing us to find topics related to a search term and thus the articles related to that topic.

Various climate disaster types can also be found on a United States map with the number of incidents separated by states. Estimates of the public's opinion on certain climate questions can also be seen on the survey data page. A breakdown of public interest into climate news can be found on the climate relevancy page.

REQUIREMENTS

Hardware:

- Mac
- Linux

Software:

- Python
- PostgreSQL
- BERTopic
- DASH

Version Control:

- GitHub (<http://www.github.com>).

CONTRIBUTION

```
.darkMode{
  display : flex;
  width: 30%;
  margin-left: 5%;
}
```

```
layout = html.Div([
  html.H1("Climate Survey Data", style={"text-align": "center"}),
  html.P("Questions asked", style={"margin-top": "5px"}),
  dcc.Dropdown(id="Choose-Question",
    list=list of options,
    options=getQuestions(dfMeta),
    multi=False,
    value="effectweather",
    className="optionsList"
  ),
  dcc.Slider(id="Choose-Year",
    step=1000,
    marks={
      2014: "2014",
      2016: "2016",
      2018: "2018",
      2019: "2019",
      2020: "2020",
      2021: "2021"
    },
    value = 2018
  ),
],
)
```

```
dbc.Collapse(
  title="UI",
  children=[
    dbc.Card([
      html.H3("Date Range", className="card-title"),
      html.P("Select start date and end date to filter",
        className="card-text",
      ),
      ],
      className="mb-3",
      style={"width": "50%"},
    ),
    dbc.Card([
      html.H3("Sources", className="card-title"),
      html.P("Filter by sources of information",
        className="card-text",
      ),
      ],
      className="mb-3",
      style={"width": "50%"}
    )
  ],
)
```

```
load_dotenv()
Newswhip_Data_Path = os.getenv('Newswhip_Data_Path')
user = os.getenv('user')
password = os.getenv('password')
port = os.getenv('port')
host = os.getenv('host')
database = os.getenv('database').lower()
```

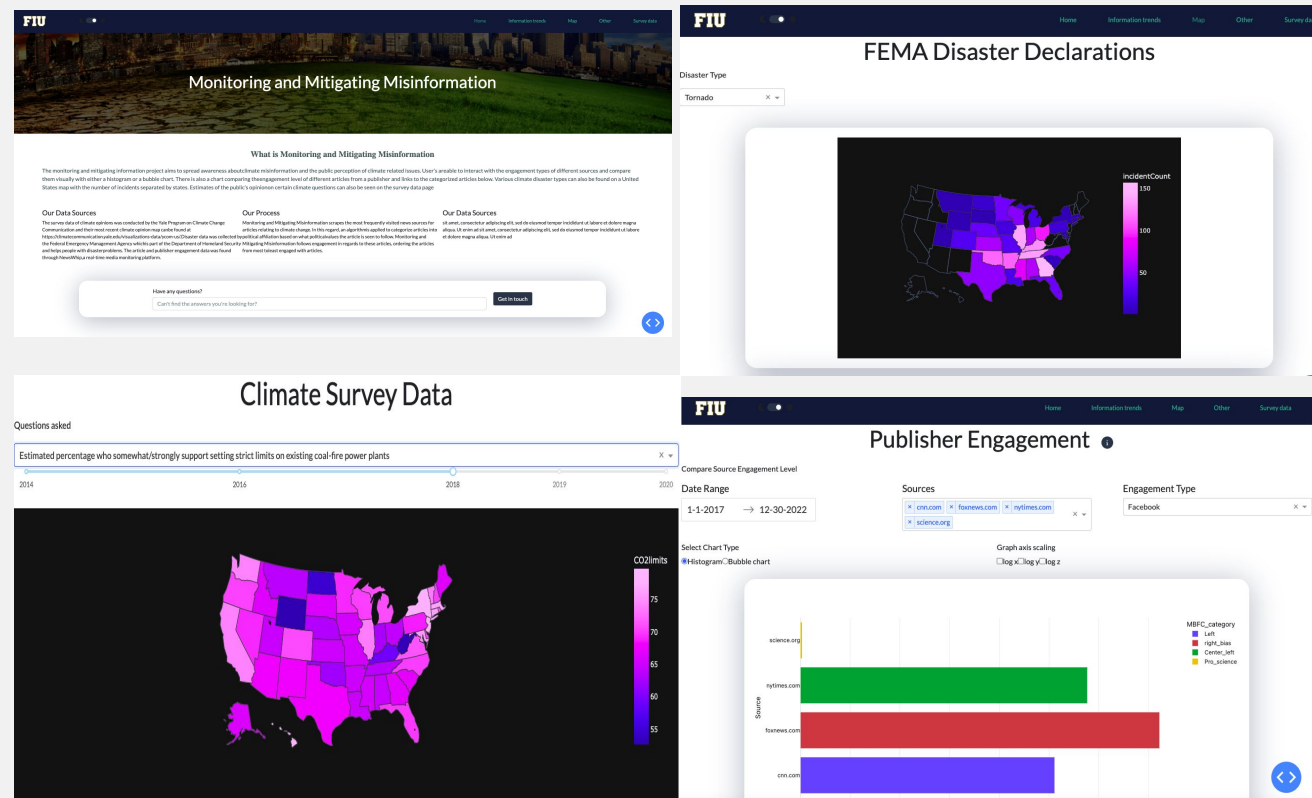
Dark Mode - Made a toggleable switch on the top of every page that allows the user to switch the page from light mode to dark mode for a more enjoyable viewing experience.

Survey Data - Found the Yale survey dataset and smoothly integrated a page that allows users to gage the general consensus on a particular question. This is represented visually with a map of the United States with the option to select a specific year to see the how opinions change over time.

UI Adjustments- Made various design changes to the user interface to make the application more appealing. This included making 3d bubble charts of the data and collapsible buttons that describe certain sections of the project.

Database Assistance - Helped with the initial creation of the database using PostgreSQL and pgAdmin. Used the entity relationship diagram feature within pgAdmin to better communicate the inner workings of the database to others.

DASHBOARD

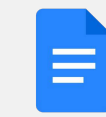


SUMMARY

We compiled the work from the previous capstone iteration and turned it into a DASH multi page application with analytical functions and visual aids in the form of dynamic graphs. We used BERTopic to cluster the articles in meaningful groups to find relevant documents to the user's searched term. All the Newswhip data static files that were being used as a reference for the scripts were put into a Postgres database. We tested the database by building a proof of concept using optimized queries.

We created a multithreaded processing scraper using beautiful soup. All UI features were added during this terms iteration. BERTopic used to cluster articles based on their text and headlines. Github pages were deployed and used for collaboration. Database was created, connected to and queried to from application. Further iterations will make an application that is more depended on the database.

IMPLEMENTATION



Google Docs - Used to keep track of everyone's contributions to the project. Multiple meetings and their information has been recorded through Google Docs.



Github - A site we used to access our code. For the group to test and add changes to the project.



Plotly - Allows a point & click interface. Assists in creation of our dashboard.



PostgreSQL - Relational database management system.



Python - The main language that we used for this project.



BERTopic- Topic modeling technique we used to cluster articles based on their text and headlines.

REFERENCES



Engineering
& Computing

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FLORIDA INTERNATIONAL UNIVERSITY