

**Project Name:** Shafts in the Whirlwind

**Group Members:** Kolton Baldwin, Sam Cochran, Chelsey Noorda, Thomas Fackrell

**Project Description:** Using data from the National Hurricane Center, we hope to accurately predict when and where (if at all) a hurricane will make landfall. The more accurate the predicted trajectories, the more time residents will have to prepare for and evacuate before a storm makes landfall.

**Questions to answer:**

- Can we improve the methods used in predicting the trajectory of hurricanes?
- How do predictions differ for Atlantic and Pacific hurricanes?
- How effective are Neural Networks vs. Markov models at tackling this problem?

**Datasets we will use:**

- We will use the NHC HURDAT2 datasets, which contain data for hurricanes from 1851-2019. There are 83,928 lines of data between the Atlantic and Pacific sets. These sets have a lot of data, including wind velocity, longitude and latitude, pressure, wind radii, etc... measured at 6 hour increments.
- <https://www.nhc.noaa.gov/data/#tcr>

**Potential Techniques to Use:**

- Markov Chain methods, Recurrent Neural Networks, Transformer Models, and potentially other methods covered in class

**Metrics to Use:**

- Physical proximity to actual historical data (specifically the space-time location of landfall).

**Responsibilities:**

- Scraping the text data and formatting it to input into the model: Sam and Kolton will take the lead in cleaning the data extracted from the NHC. The data cleaning process will include standardizing format and deciding which storms need to be omitted from our model for lack of data (early records included fewer measurements). Chelsey and Thomas will research techniques to determine when a storm has made landfall and similar approaches others have taken to this problem using neural networks and transformers.
- We will all collaborate in each part and bring our own expertise and willingness to learn to each part of the project. The work will be collaborative with each team member actively involved throughout the project, especially as we work on training, testing, and refining our model.