## Introduction

- Social media today, is replete with information and data.
- Useful work has already been done on data mentioning past and present news to derive valuable insights.
- Social media is now being used to plan, organize and advertise events. This presents a potential opportunity to organize these events' data to help people make better decisions.
- Twitter data has been used to generate insights for the system. Tweets have been pre-processed, categorized and transformed into structured data to create a user friendly visual analytics system - CrystalBall.
- The intended users for this visual analytics system are: city officials, public safety personnel, planners, facilities managers, retailers or others who might be interested in participating and contributing to events taking place in their vicinity.

System Description

- The system consists of 6 views. Technologies used to build the system are - HTML, CSS, JavaScript, D3.js, Leaflet, Tagcloud, jQuery and Bootstrap.
- Event Calendar View: Shows events occurring on different dates.
- Map View: Shows events occurring in different locations.
- Word Cloud View: Shows keywords related to the events.
- Social Network View: Shows events sharing same location and popularity of the events.
- Tweets View: Shows tweets related to selected events.
- Extension: Events Category View, which shows distribution of events among different categories.
- All the view are highly interactive with each other.
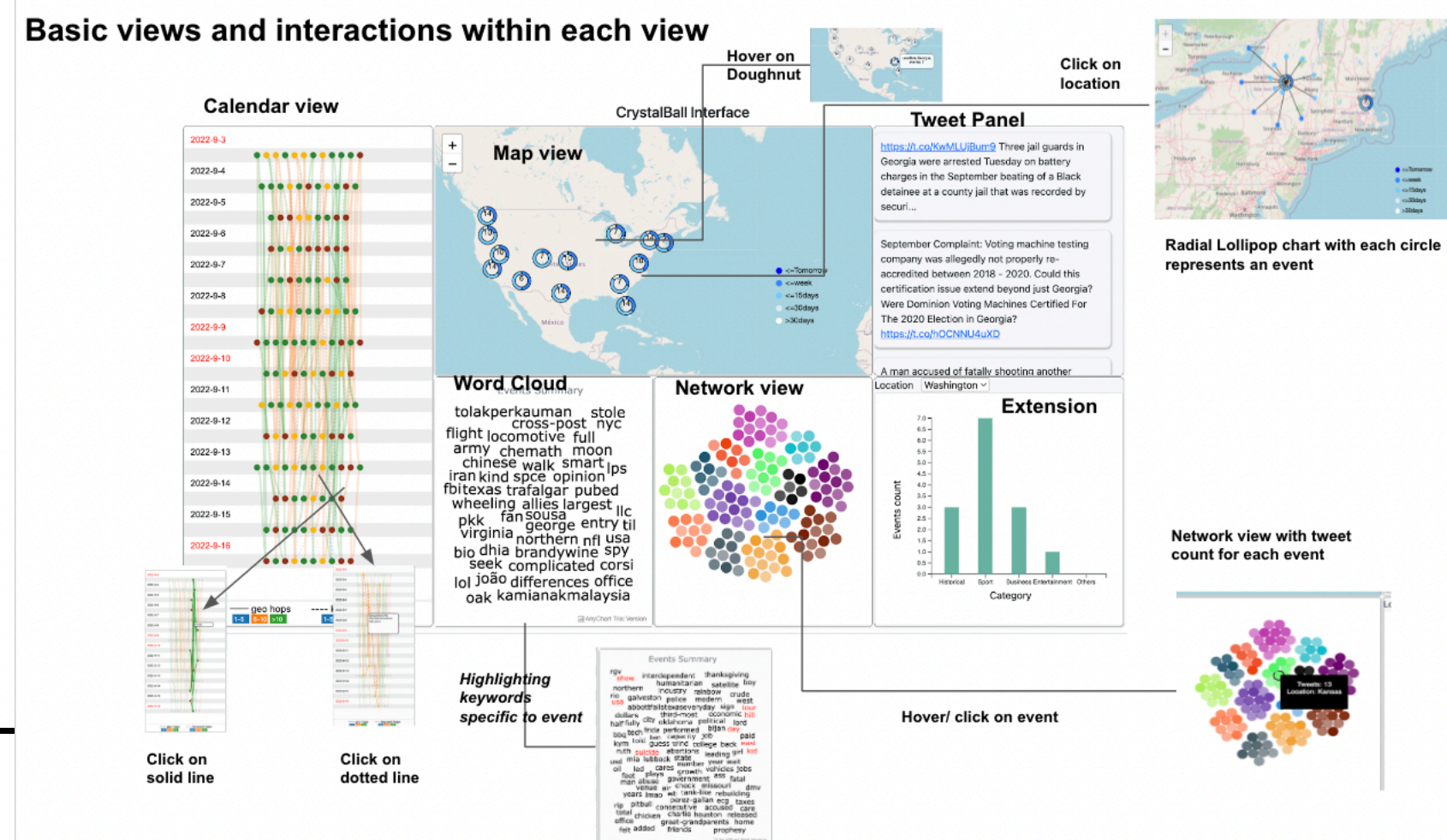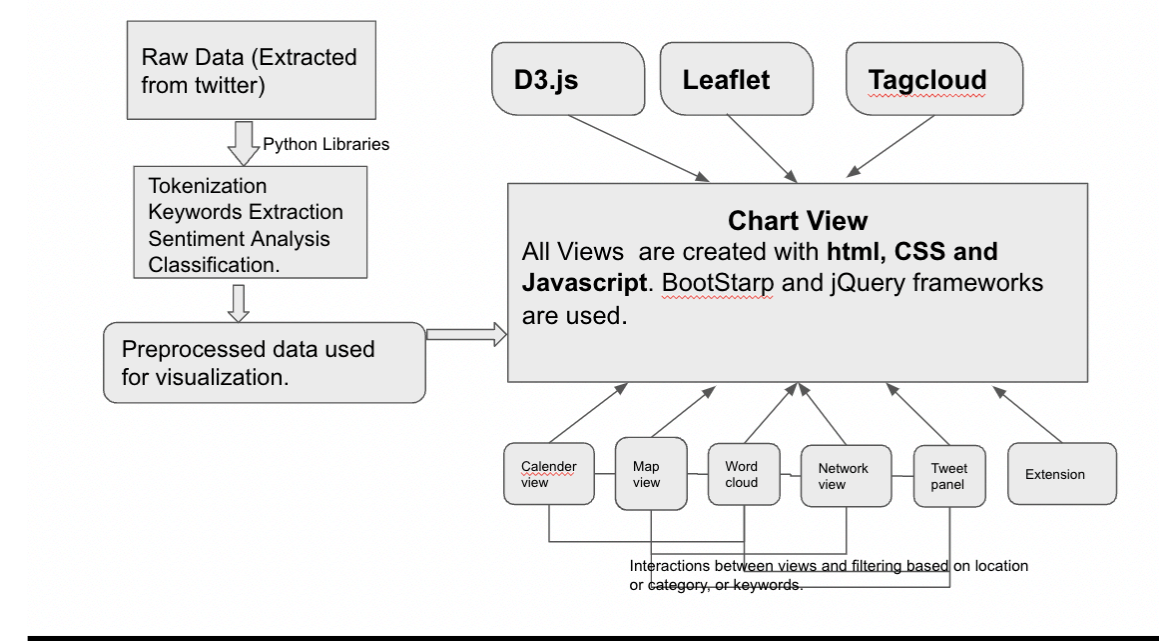
Datasets:

- Streams of twitter data are collected using tweetPy API, with an input query such that there are no duplicates and the message contains one among the 14 locations considered and 'September', which is the month considered.
- DateFinder API has been used to identify the dates from each message, and to converge tweets into events
- Tweets have been cleaned up using pre-processing techniques such as lemmatization, tokenization, and removal of stop words.
- Bert Model and Logistic Regression Model were utilized respectively for sentiment prediction and category prediction.

System Architecture

Basic views and interactions within each view

Interactions in between views
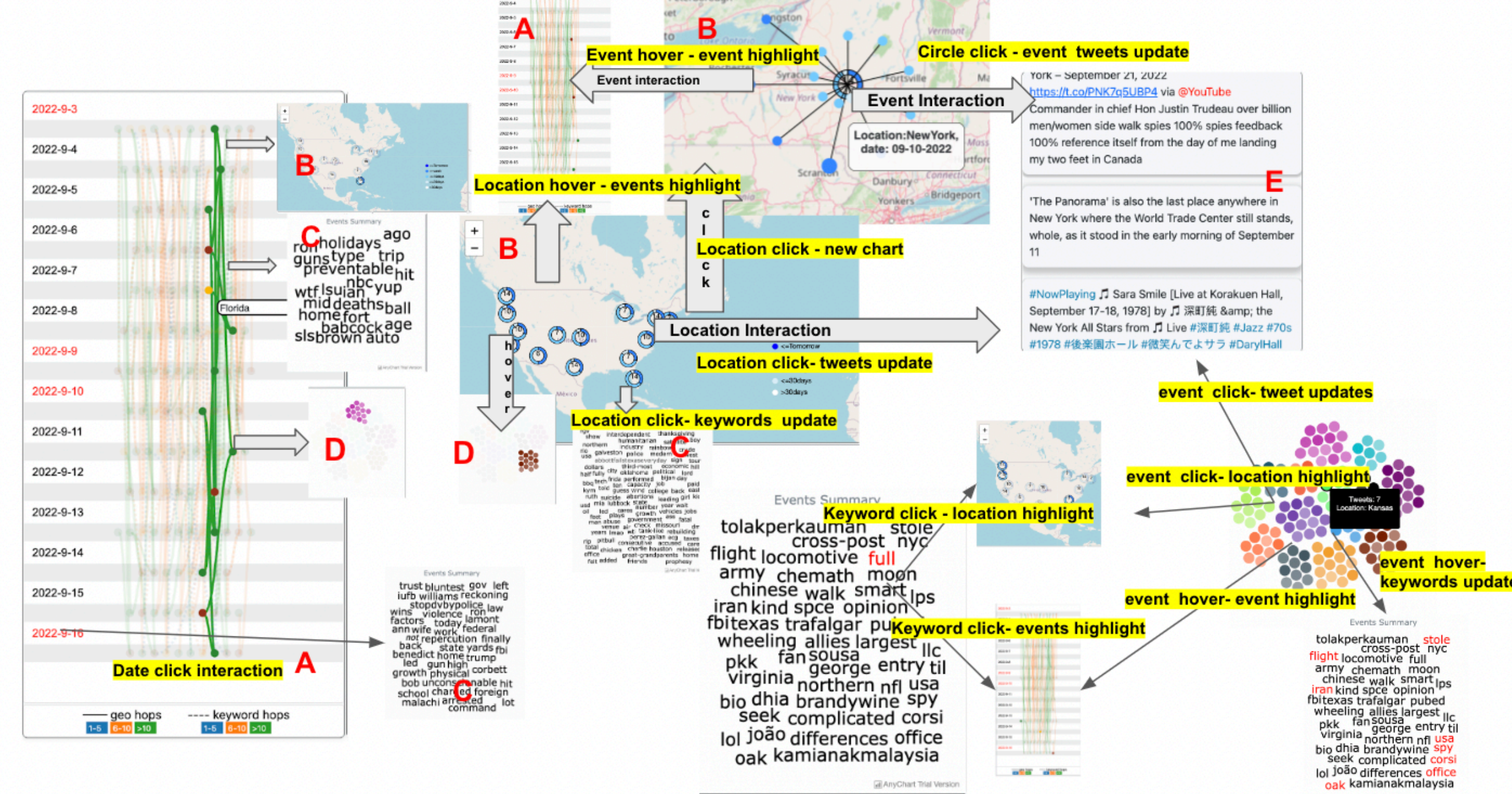
Results:

- Future events were successfully predicted for multiple locations within the United States, using the tweets extracted and by applying Machine Learning techniques.
- The predicted events were visualized in multiple ways with respect to their date, location, sentiment, and text summary using the Crystal Ball Interface studied.
- The extension developed helps in identifying the number of events based on their type/category at each location.
- Using this visualization, a user interested in exploring certain events based on their location or category, can pick any sub-visualization and narrow down to the details of their choice with all the interaction support implemented.

[Bharath, Karthik, Keerthana, Nikhil, Sandhya, Tanisha]
[bbandaru@asu.edu, knelapa1@asu.edu, kgolusul@asu.edu, nmiriya1@asu.edu, sbalaj17@asu.edu, ttembhre@asu.edu]