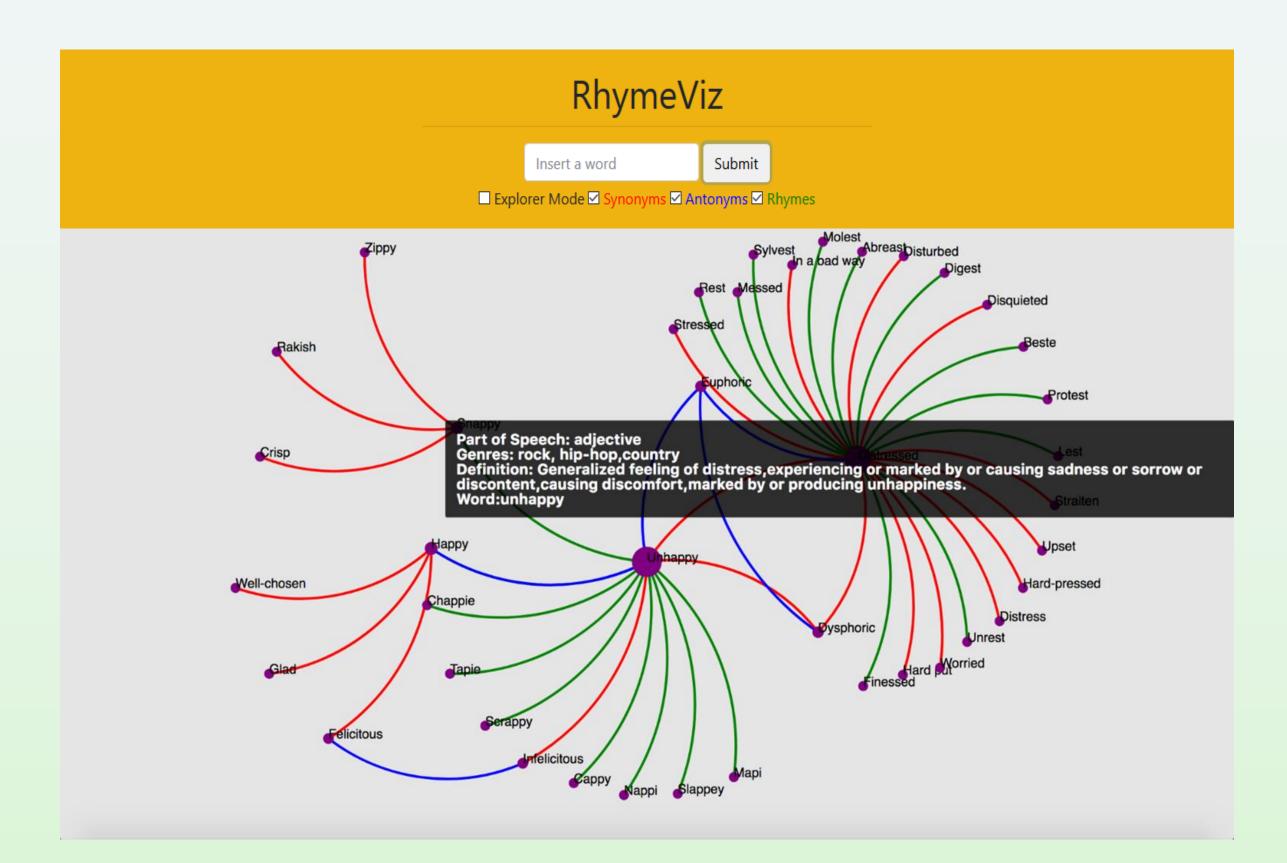# Interactive Assistant Tool for Exploration of Rhymes and Synonyms (Rhyme-Viz)

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CSE6242- Data and Visual Analytics

Georgia Tech

Introduction

- Problem statement
  - Finding rhyming words for a poem is a considerable challenge.
  - Going through a rhyming dictionary or a thesaurus can be exhausting.
  - Visualization makes this task much easier.
- Solution
  - A comprehensive visual and interactive program to simplify exploration of rhymes and synonyms for poets in a continuous graph structure.
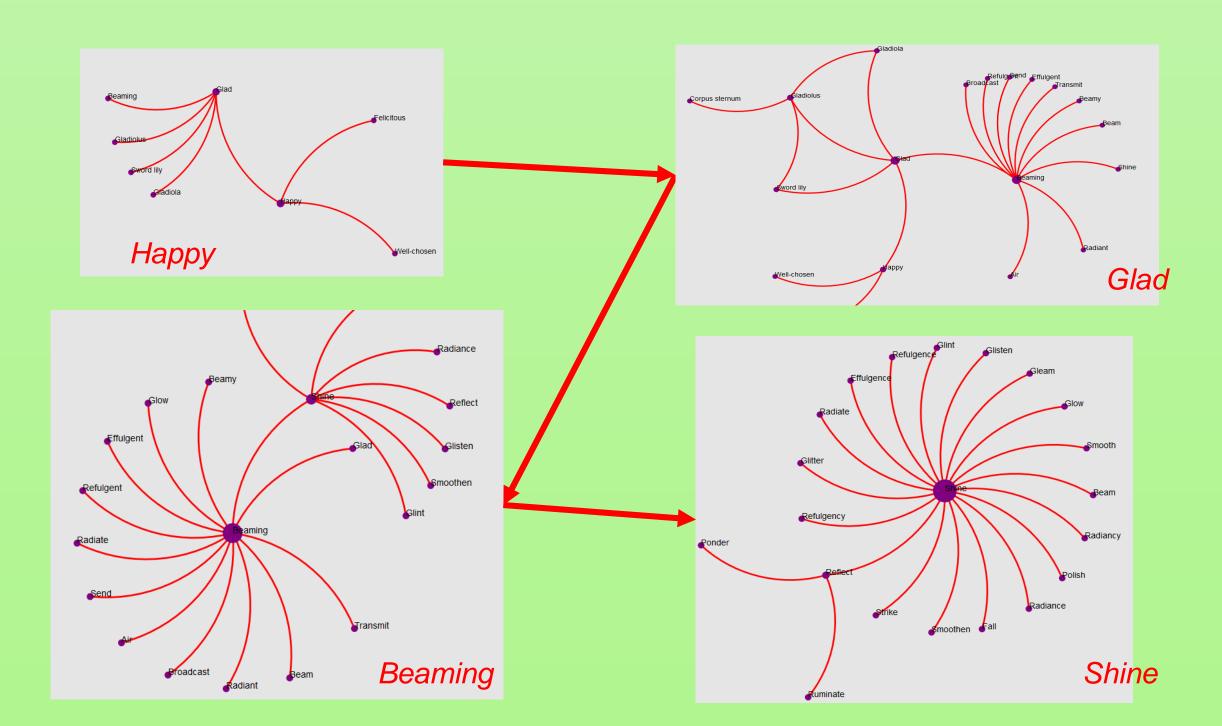

Proposed Approach and Data

- Data resources
  - Dictionary databases from the Python Natural Language Toolkit
  - 150,000 words and about 60 megabytes
  - Additional scraped data from billboard.com and Genius.com for word analysis
- Cloud Architecture
  - Application submits get requests through jQuery
  - API returns JSON formatted data
- Visualization
  - D3 force layout is used to create an interactive graph
  - Shows Synonyms and/or antonyms and/or rhymes
  - Explorer mode lets user to hop from one word to another and load more results

Explorer Mode

- This mode helps with
  - Moving to neighboring nodes
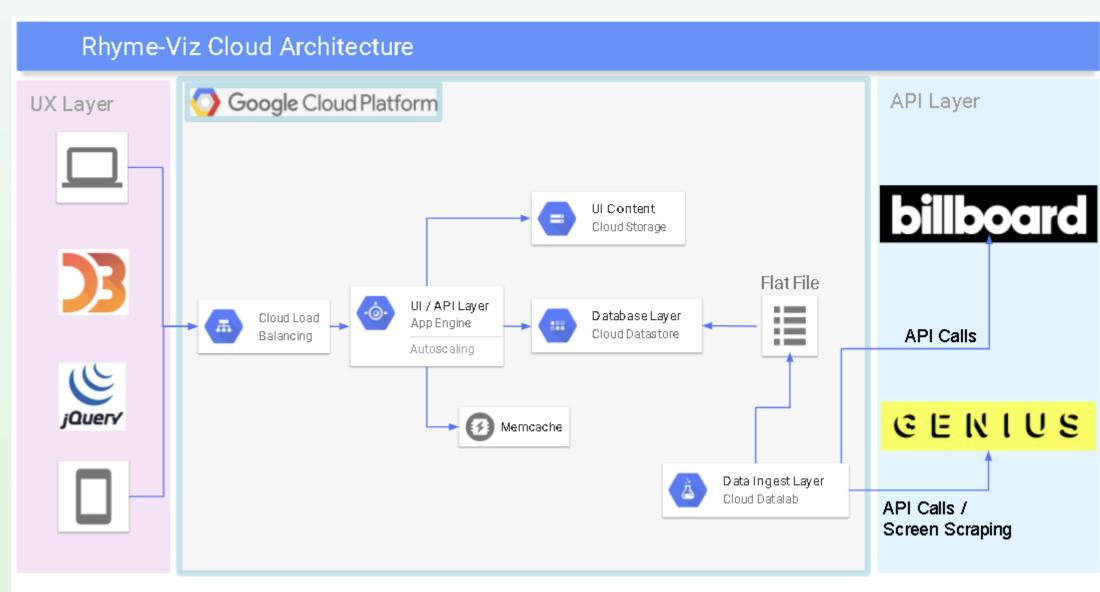 - Discovering new synonyms, antonyms and rhymes

Rhyme-Viz Architecture

Google Cloud

- Rhyme-Viz utilizes a **"serverless"** architecture running on **Google Cloud Platform**. By leveraging **cloud services** our team was able to focus on **developing our software** and **refining our data**.
- **User Interface** - D3 and Javascript running on Google App Engine
- **API Layer** - Python serving REST / JSON via Google App Engine
- **Data Layer** - NoSQL key-value store running on Google Cloud Datastore
- **Data Ingest Layer** - Python notebooks running on Google Cloud DataLab

Word Analysis

- On mouse over RhymeViz provides more information on each word
  - Definition
  - Parts of speech
  - Genres
    - Genres data is generated by scrapping and API calls
    - billboard.com gives us top 300 songs of the past 20 years
    - genius.com gives us lyrics of each song
    - With some coding RhymeViz tells in which genres the word is common.

Experiments and Results

- RhymeViz is evaluated through a user Study
- Experiment details
  - Baseline
    - Online thesaurus: thesaurus.com
    - Online rhyming dictionary: rhymezone.com
  - User were asked to the following first with RhymeZone and then with the websites
    - Imagine they are writing a song
    - Choose an initial word
    - Find a synonym for the initial word
    - Find a rhyme for the synonym
    - Explore and play with different options
    - Repot timing, pros and cons and general feedback
- Results
  - Timing: RhymeViz and wesites require about the same time
  - Pros and cons of RhymeViz

Pros	Cons
Cool design and idea	Sometimes shows too many words
Shows interaction of words	Occasional software crash and bugs
Explorer mode	Limited synonyms
Genres analysis	Looks can improve

- In general users supported the idea and implementation and described it as a fun experience!

Contact

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