ShakesPeer:
A Tool for Visualizing Character Relationships in Shakespearean Literature

CPSC 547
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Motivation

Shakespearean literature can be difficult to understand

- Unfamiliar diction + syntax
- Complex storylines
- Richly textured characters and dynamic relationships

Love

Death

Betrayal
Goal of ShakesPeer

Help readers understand & keep track of **characters** and their **relationships**
Background

A Midsummer Night’s Dream (1595)

- Multiple interconnecting plots
- Characters frequently fall in and out of love with each other

Character-to-Character Sentiment Analysis

- Determine how character A ‘feels’ about character B
  - Extract all lines character A says to character B
  - Use sentiment lexicons that map words to **polarity values**
    - +ve for positive sentiment, 0 for neutral, -ve for negative
What/Why/How

What: Data

- **Table**: dialogue (with speaker, recipient)
- **Derived**: Engagement
  - # of words character A speaks to B
  - # of words A speaks in scene X

Sentiment

```
[ACT I]

[Scene 1]
Enter Theseus, Hippolyta, [and Philostrate,] with others.

THESEUS
Now, fair Hippolyta, our nuptial hour
Draws on apace. Four happy days bring in
Another moon. But, O, methinks how slow
This old moon [wanes!] She lingers my desires
Like to a stepdame or a dowager
Long withering out a young man’s revenue.

HIPPOLYTA
Four days will quickly steep themselves in night;
Four nights will quickly dream away the time;
And then the moon, like to a silver bow
[New1]-bent in heaven, shall behold the night
Of our solemnities.

THESEUS
Go, Philostrate,
Stir up the Athenian youth to merriments.
Awake the pert and nimble spirit of mirth.
Turn melancholy forth to funerals;
The pale companion is not for our pomp.

[Philostrate exits.]

ROBIN
The King doth keep his revels here tonight.
Take heed the Queen come not within his sight,
```
What/Why/How (cont.)

Why: Tasks

- **Discover** how sentiment & engagement change over time
- **Compare** character relationships
- **Identify** points in story where major relationship changes occur

- **When does Titania fall in love with Bottom?**
- **How does Bottom feel about Titania at the end of the play?**
What/Why/How (cont.)

How: Encode
- **Directed graph**
  - Color for character type, sentiment
  - Size for engagement
- **Grouped bar chart** with diverging y-axis
  - X-pos for scene, Y-pos for sentiment

How: Reduce
- **Filter** by scene, character, character type
Implementation

1. Pre-processing of full play script
   ○ Extracting characters, word count per scene/character, etc.
2. Perform character-to-character sentiment analysis
   ○ Natural Language Toolkit in Python 3
   ○ Bing Liu’s Sentiment Lexicon
3. Implement web app
   ○ D3.js for visualization
   ○ Angular front-end framework
Web App Components

Sidebar

Node-Link View

Character-Pair View
Demo

Scenario of use

Imagine you are writing a report about Bottom.

You want to answer the following questions:

- Which characters does he interact with?
  - Does he interact with any of the fairies?
- When does Titania first encounter Bottom?
  - How do they feel about each other?
- In the scenes where the two characters interact, who speaks the most? Who does Bottom speak to the most?
Future Work and Limitations

Comparing and visualizing multiple plays

- How does Titania and Bottom’s relationship compare to Romeo and Juliet’s?

Addressing the “hairball effect”

- Problems with scale: many characters and many relationships
  - Shakespeare’s plays can have 60+ characters!
- Alternatives like matrix views
Future Work and Limitations (cont.)

Naive assumptions for sentiment analysis

- What happens if character A talks to character B about character C?
  - e.g. Gossip

Running usability studies

- Who would use it and what would they want?
  - Different needs of students, literary scholars, or professors?
  - Making recommendations about what to explore first?
  - Other measures of interest besides sentiment?
    - e.g. Setting of speech, Themes
Thank you!