Personæ: A Character–Visualisation Tool for Dramatic Texts

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Introduction

This paper explores the development of the _Personæ_ tool (code available on Github), an interactive resource for exploring patterns of speeches by and mentions of characters in dramatic texts. Initially developed to examine works by Shakespeare, the tool has broad application to dramatic texts.

Visualising the frequency, extent, and position of dialogue relating to a particular character presents users with a simple and immediate measure of that character's prominence within the play. The _Personæ_ tool enables users to select and visualise individual characters' involvement, producing a novel means of exploring large-scale structural, narrative, or character-focused patterns within the text.

The tool is intended to facilitate character-based analysis and reveal structural patterns at the scale of the play. The tool was conceived with exploratory potential in mind, and is designed to allow users to customise the visualisation according to their particular interests or to follow a more speculative and disinterested reading of the play's character-based features.

This deliberate aim emerged from the heuristic development process described below, and a desire to produce an extensible exploratory tool for dramatic texts. From an initial focus on using digital tools to visualise the tangling and disentangling of character names and identities in _The Comedy of Errors_, our interest broadened into exploring the potential for using character data to visualise larger structural and narrative patterns.

We were also motivated by the use of network analysis and visualisation for scholarship on Shakespearean and other literary texts, including work by Yose et al (2016), Grandjean (2015), Moretti (2011), and Stiller, et al. (2003). These analyses are similarly character-based and have yielded many interesting insights. But in the reduction of the textual data to nodes and edges (characters and their interactions), network analysis has obscured the temporal. The work of Xanthos, et al. (2016) maintains this temporal dimension, while exploring the dynamics of the character networks as they evolve. In contrast, by visualising the characters at the level of the play as a whole, we aim to preserve characters' locations within the space of the text, thereby enabling analysis of the dramatic time and structural duration of the play.

Tool Development

Tool development took part in two phases. First, the data was extracted and transformed into a suitable format. The user interface was then designed using an iterative process that enabled the exploration of various approaches to data presentation and interaction.

Data Preparation

The tool uses data contained in XML files provided in the New Variorum Shakespeare editions of _The Comedy of Errors_ and _The Winter's Tale_.

Data was extracted using a custom-developed Python script which iterates through each play's XML file extracting character and name data, along with line number, scene and act identifiers. The data as output as JSON, which reduces the complexity of using it with the JavaScript-based user interface.

User Interface Design

The tool's web-based user interface (Figure 1) was developed using the open source Javascript library, D3 (Bostock et al, 2011). _Personæ_ developed from a fixed and static visualisation of _The Comedy of Errors_ to a more interactive and exploratory tool. In the heuristic spirit of the tool itself, we describe here its various iterations, the stages of its development, and the motivations for various changes to its design and functionality throughout the process.
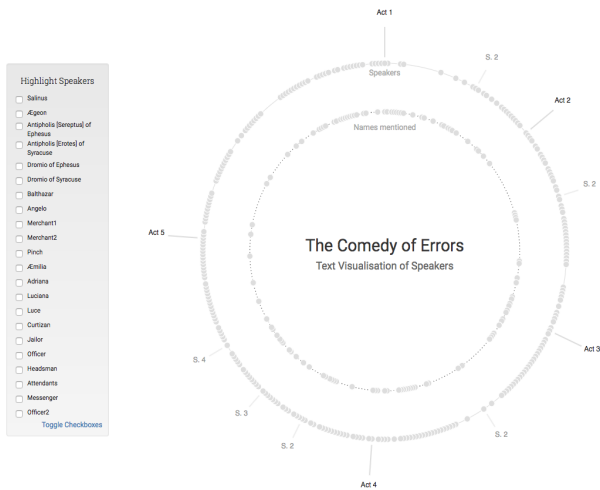
Figure 1: *Personæ* Character Visualisation Interface - From the First to the Second Iteration

Personæ's focus on character and temporal visualisation is present in the first iteration of the tool (Figure 2). Speeches and mentions are plotted along a timeline, with a tabular view switching between the five acts of the play. All speeches and mentions are colour-coded, resulting in some interesting patterns and densities at certain parts of the text, but lacking the facility for isolating chosen characters. In addition, the tabular view of the five acts lacked the desired holistic view of the entire play.

Figure 2: First iteration design

Expanding the Second Iteration

The second iteration of the tool adopted the circular layout of the tool to plot character involvement across the entire play, as shown in Figure 3. At this point, the tool was still static, and its focus on the two pairs of twin characters in *The Comedy of Errors* represented a desire to deploy visualisation for a particular exploratory purpose. The play operates on the basis of identity and confusion, as Antipholus and Dromio of Syracuse are mistaken for their Ephesian counterparts, and vice versa. Our aim was to plot the speeches of these four characters to see if the visualisation revealed any insights into how the identity question was introduced and managed at a structural level.
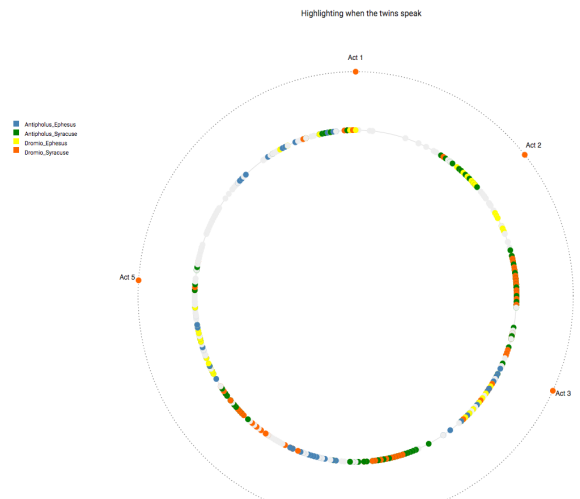

Figure 3: Second iteration design

Indeed, the visualisation presents several clustered scenes of engagement between the pairs of twins through which various errors and misunderstandings are played out. The tell-tale single appearance of Dromio of Syracuse's orange marker in Act 1, Scene 2 precisely represents the beginnings of the error and confusion: "What now? How chance thou art returned so soon?"

An additional avenue of exploration in the second iteration of the tool was the geographical mapping of locations mentioned in the play. *The Comedy of Errors* is known for including the only mention of America in Shakespeare's plays, among several other placenames in its text. In some respects, this visualisation gives a false impression of *The Comedy of Errors* as a worldly play. While eighteen locations are mentioned in the text, several of these are ironically located by Dromio of Syracuse on Nell the kitchen-maid's body, because "she is sphericall, like a globe: I could find out / Countries in her" (Act 3, Scene 2).

The final interface

As useful as this view of the play proved, we felt at this point that a more dynamic and interactive interface was required to allow users to test hypotheses like our own, or to undertake more exploratory and experimental visualisations of the data, as illustrated in Figure 4. The circular layout was retained, as it provided a useful method of presenting the play as a whole, while maintaining the temporal dimension of the character interactions. The character-selection menu and the scene-divisions in the outer ring were thus added in the final stage of development.
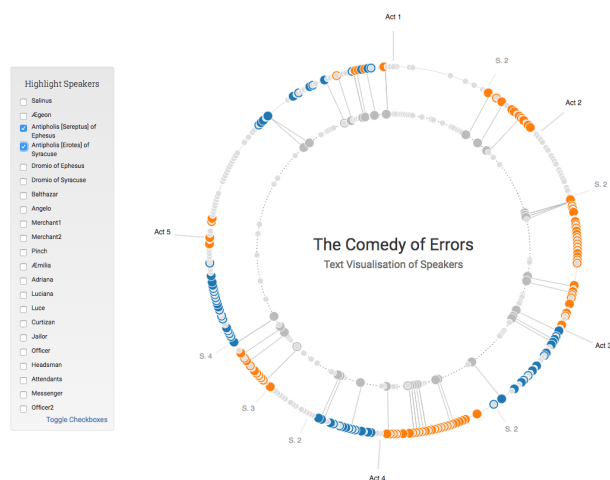

Figure 4: Final interface design

Also added were visualisations of higher level metrics to illustrate the number of times a character speaks, and the number of lines they speak.

Conclusion

A major part of the tool's value is its extensibility. It may be used to create character visualisations for any play which is XML-encoded according to quite minimal specifications, and offer the opportunity to undertake comparative analysis of structural, narrative, and character-based patterns in different plays. Indeed, while the development of the tool focused on *The Comedy of Errors,* a similar visualisation of *The Winter's Tale* (Figure 5) was generated from New Variorum Shakespeare XML files with no revision to our code.

Figure 5: Visualisation of The Winter's Tale

The trajectory of *Personæ*'s development from fixity to interactivity represents a conclusion that we drew in the course of this project: that a visualisation tool developed for a particular purpose need not be confined to its use for that objective alone. The modular and open-source principles of software development have contributed to a rich and fruitful habit of sharing within the field of Digital Humanities, and we hope that others will build upon the tool that we have developed here.

Indeed, we have plans for further developments and improvements to *Personæ*. Working towards a tool which will enable structural and thematic comparison of the thirty-six plays in the First Folio, the next phase will test for structural correlations in a thematic grouping of five additional Shakespearean plays. This development will strengthen *Personæ*'s potential for generating insights into macro-level structural analysis of dramatic texts, while testing its technical extensibility by incorporating XML files from another source, *The Bodleian First Folio.*

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