Poemage: Visualizing the Sonic Topology of a Poem

Nina McCurdy, Julie Lein, Katharine Coles, Mirah Meyer
Machinations
Calcite
Clark Coolidge

acetone-imprinted
mellurie, water on the swan car barn oil wall
ocanna & mumps
wedge, wet green
I'd leave sole key to this game to my friend, clear water cat

impressed
weaving candle turn on computer cigarette, paper wall
tarheels & balance
a lot of yellow tickets
He'll have to hurry & carry away, to my blue friend hustling bringing
his moon & car

agate inked
merry melodies drool on tarman of wet lead star tool
crayon & sand
length of granite duck - drill
It's sucking up the strand, his crystal flag, & the eels tube for that
their parade swizzle fun

swizzle
suckling dry - Ice spaghetti, king ace supper at church
hard pinks & sponge breath
many forarms drift

roller window going on I repeat my offer food list in iron flakes
Domain
Data Abstraction
Visualization System
Design Process
Domain

Data Abstraction

Visualization System

Design Process
Distant Reading

- Bag of Words
- Sentiment Analysis
- Word Cloud
- Ngram

Close Reading

- Literary Criticism
- Rhetorical Analysis
- Poetry Exegesis

Value of computation to close reading is still an open question
Unproven Computational Value

You don’t know what you’re looking for and why you’re looking for it, how then do you proceed?”

- Stanley Fish

Is it possible to visualize poetry with a level of complexity that would allow for new and interesting observations?
Visualization Space: Sonic Patterns

**Sonic Turbulence**: Locations of increased intensity, intersection, activity

Conceptual metaphor of “flow” of sound moving through poem
Domain

Data Abstraction

Visualization System

Design Process
Rhyme Sets

- **RhymeDesign**: System to automatically sonify a poem
- Developed formalism for detecting sonic devices
- Ordered based on location in poemspace
- Each word can belong to none, one, or many rhyme sets
- User-defined, custom, or system-defined
## Rhyme Sets

<table>
<thead>
<tr>
<th>Rhyme type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical rhyme</td>
<td>match in all sounds. Includes repeated words and homographs</td>
<td>pair/pair; pare/pair</td>
</tr>
<tr>
<td>Perfect rhyme:</td>
<td>matching stressed vowels sound and all proceeding sounds</td>
<td>rhyme/sublime</td>
</tr>
<tr>
<td>Perfect masculine rhyme</td>
<td>stress on the final syllable</td>
<td>picky/tricky</td>
</tr>
<tr>
<td>Perfect feminine rhyme</td>
<td>stress on the second to last syllable</td>
<td>gravity/depravity</td>
</tr>
<tr>
<td>Perfect dactylic rhyme</td>
<td>stress on the third to last syllable</td>
<td></td>
</tr>
<tr>
<td>Semirhyme</td>
<td>perfect rhyme with additional syllable on one word</td>
<td>end/defending</td>
</tr>
<tr>
<td>Syllabic rhyme</td>
<td>perfect rhyme between stressed and unstressed syllables</td>
<td>wing/caring</td>
</tr>
<tr>
<td>Consonant slant rhyme</td>
<td>matching trailing consonants of stressed syllables</td>
<td>and/bent</td>
</tr>
<tr>
<td>Vowel slant rhyme</td>
<td>matching vowel sounds of stressed syllables</td>
<td>eyes/light</td>
</tr>
<tr>
<td>Pararhyme</td>
<td>matching leading and trailing consonants of stressed syllables</td>
<td>tell/tail/tall</td>
</tr>
<tr>
<td>Syllabic 2 rhyme</td>
<td>rhyme between initial stressed syllables</td>
<td>restless/westward</td>
</tr>
<tr>
<td>Alliteration</td>
<td>matching leading consonant sounds of stressed syllables</td>
<td>languid/lazy/line/along</td>
</tr>
<tr>
<td>Assonance</td>
<td>matching vowel sound (independent of stress)</td>
<td>blue/estuaries</td>
</tr>
<tr>
<td>Consonance</td>
<td>matching leading and/or trailing consonant sound (independent of stress)</td>
<td>shell/chiffon</td>
</tr>
<tr>
<td>Forced rhyme</td>
<td>perfect rhyme with imperfect match in final consonant sounds</td>
<td>shot/top/sock</td>
</tr>
<tr>
<td>Eye rhyme</td>
<td>spelling indicates perfect rhyme but sounds do not match</td>
<td>cough/bough</td>
</tr>
<tr>
<td>Character clusters</td>
<td>matching substring involving 1-4 characters</td>
<td>restless/westward</td>
</tr>
<tr>
<td>Mixed character clusters</td>
<td>mixed substring involving 2-4 characters</td>
<td>inlets/itsel</td>
</tr>
<tr>
<td>Anagram</td>
<td>words formed out of the same set of characters</td>
<td>nights/things</td>
</tr>
<tr>
<td>Phonetic alliteration</td>
<td>leading consonants of stressed syllable match in mouth placement</td>
<td>pen/boy</td>
</tr>
<tr>
<td>Phonetic assonance</td>
<td>vowels of stressed syllables match in mouth placement</td>
<td>edible/anchor</td>
</tr>
</tbody>
</table>
Poemspace

2D space of the poem as printed on page
Sonic Topology

Distribution of rhyme sets across the poem

Intersect  Merge  Diverge  Emerge

Overlapping
Domain
Data Abstraction
Visualization System
Design Process
Set View

- Circles represents individual rhyme sets
- Radius encodes # of words
- Collapse and expand
- Set description on hover
Poem View

- View poetic devices in original form
- Annotation-style enclosure
- Select word will identify all associated sets
- Build custom set
Path View

- Represents words as nodes in poemspace
- Highlights path of selected set
- “Show Context” slider
- Fill to show regions enclosed by intersecting sets
- Show ambiguous pronunciations
Path View - Routing

- Shortest path preserving spatial location
- Routed to avoid occluding words and ambiguous set membership
- Identify closest whitespace to edge
- Interpolating cubic bezier curve
Consistency across views

- Linked highlighting
- Consistent color to identify sets
- “Beautiful mess” to show everything
Machinations: Calcite
Clark Coolidge

acetone-imprinted
acetic acid on the wall
I'd leave the key to this game to my friend, acetone-water
acetic acid impressed
weaving, candle, turn on computer, cigarette, paper wall
tarheels & balance
a lot of yellow
He'll have to hurry & carry away, to my blue friend, dusting, bringing his moon & car

agate inked
merry melodies drool on the strand, star tool
length of granite, drill
It's sucking up the strand, his crystal flag, & the eels tube for that, their parade

sucking dry—ice, spazze—rolling ace, super at church

Roller window going up on a car, I repeat my offer food list in iron flakes
<table>
<thead>
<tr>
<th>System</th>
<th>Poemage</th>
</tr>
</thead>
<tbody>
<tr>
<td>What: Data</td>
<td>Text in ‘poemspace’</td>
</tr>
<tr>
<td>What: Derived</td>
<td>rhyme sets, sonic topology</td>
</tr>
<tr>
<td>Why: Tasks</td>
<td>Identify and compare sets and set interactions</td>
</tr>
<tr>
<td>How: Encode</td>
<td>Connection link marks, ellipse enclosure</td>
</tr>
<tr>
<td>How: Facet</td>
<td>Linked coloring and highlighting</td>
</tr>
<tr>
<td>How: Reduce</td>
<td>Collapse/expand filter</td>
</tr>
<tr>
<td>How: Manipulate</td>
<td>Navigate with scroll</td>
</tr>
</tbody>
</table>
Validation

- Insight-based evaluation
- Collaborators given tutorial and a week to explore:
  - Close Reading
  - Erasure Poetry
  - Cento Making
  - Disruptive Technology
Domain
Data Abstraction
Visualization System
Design Process
Design Study collaboration

Skeptical Enthusiasm → Broad, open-ended conversation
Observation of practice

Uncertain Computational Value → Experimentation
Presentation of interesting features and devices

Open Design Space → Focus on untapped interpretive approach
“Screwmenutics”

Embrace concepts that visualization conventions resist

Encourage playfulness and creativity

Ambiguity as fundamental source of insight

Visual clutter as Chaos reflects what users seek to understand

Pleasure and enjoyment as productive research outcomes

Encourages exploration and increased efficacy of tool
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