

## **Turbulence and Temporality: (Re)Visualizing Poetic Time**

130. *Things My Computer Taught Me About Poems*  
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**SLIDE 1** We think about time and turbulence in poetry in the context of our larger metaphor of flow, which Julie will describe later. Poetry, though its movement is highly structured, offers the reader immense freedom to create the conditions of its structuring through reading, which brings the poem into time by releasing the turbulence captured within it. This interaction is in its essence qualitative and experiential, at once mental and physical.

To teach us, then, a computational tool must enable and enhance this interaction. But even to create such a tool we need not only to learn what about poetry can actually be quantified, but more importantly to understand with previously unpursued precision what the reading experience entails: not only what a poem does, but how. Whether or not a poem is experienced by the poet as a “spontaneous overflow of powerful feelings,” such a description, which leaves the reader out of the equation, can’t help us figure out how poetry works.

The first thing I learned from my computer, then—or rather from computer scientists—is that poets, as Wordsworth demonstrates, can be surprisingly imprecise, not to say slippery, when they talk about poetry—raising the question, among others, of when metaphors are “useful” in the practical sense and when not. To help us, our collaborators **SLIDE 2** need to know not only, yes, what poems are “like,” but also what *exactly* we want the computer to capture. At our first meeting, Min Chen at Oxford stopped me cold by asking what I meant when I talked about “poetic time,” a question that eventually led to our useful metaphor of flow. But to get there, we had to look hard at poems. This was one of many questions the answers to which I “knew” not consciously but intuitively, in ways I hadn’t yet articulated.

Min’s question also illuminates our primary need: to identify not this or that poetic element to be shown in a static way, but rather what enables a given poem to move in time. This is a profound question, one most computer tools like most poetry textbooks don’t address. Further, once we identify those elements and interactions that enable a poem to move, we need to be able to describe them, to people and machines, both in isolation and as they work together. In other words, to bring a tool into existence, I’ve had to relearn how I think and talk about poetry. Everything I’ve said about poetry so far I have learned, by which I mean *brought to mind*, from this iterative process of articulation, of saying *what I mean*. Thus, I have learned (reluctantly) that some important things about poetry are after all subject to quantification, even enlightening quantification. I’ll talk about two of them very briefly, in the context of close reading.

A breakthrough moment in our first collaboration came serendipitously, when our collaborators mentioned off-handedly that the IPA, a linguistic alphabet, could tell us

where in the mouth a specific sound was made. Intuitively, we felt this could be useful in indicating a poem's sonic turbulence as enacted by the reader's body, perhaps marking significant moments.

**SLIDE 3** Our collaborators developed pictograms showing where in the mouth a sound takes shape. Because they show mouth placement both spatially and through color, and the placement both of the current and the previous sound, a viewer can see how much turbulence the mouth undergoes as it moves from sound to sound in time.

**SLIDE 4** Working with PoemViewer to read two twentieth-century American poems—Pound's "In a Station of the Metro" and Bogan's "Night,"—we noticed that Pound's imagistic two-line poem, while sonically interesting, did not register nearly the sonic play, or turbulence, of Bogan's free-verse lyric.

This made us curious. Though poems often use imagery and sound together, we wondered whether how a poem situates its priorities in regard to sound and image might influence its sonic turbulence. Might a pure lyric, a poem that takes sound as both technique and topic, be more turbulent, or differently so, than a poem that prioritizes image over sound?

For our little study, we found twenty-two short twentieth-century poems in English whose associations with image and sound are especially clear. Some, by writers connected with the "imagist" and "deep image" schools, rely on transformative visual details and metaphors; others, both free-verse and formal poems, announce their relationship with the lyric by using "song" in their titles.

Our experiment, preliminary as it was, generated intriguing results. In general, the "songs" in our test group displayed a higher base-line level of sonic turbulence than the

poems devoted to image. The “lyric” group also demonstrated a notably higher degree of repetition, even in free-verse poems.

**SLIDE 5** Our new tool, Poemage, evolved from a commitment to honor the “poem space:” both the shape of the poem on the page and its internal actions and relationships. It has already taught me a third important thing, again by forcing me to engage and articulate: what we think makes a poem sonically interesting and what is really interesting are not always the same. While any tool must of course capture exact rhyme, it’s a simple device an able reader can identify nearly as quickly as a machine can. Subtler variations like slant rhyme **SLIDE 6** and pararhyme **SLIDE 7** are more interesting. But early prototypes showed us that none of these devices alone can capture our favorite sonic movement in Bogan’s “Night,” from “estuaries” to “breathes” to “restless” to “inlets,” which Julie will say more about. Most interesting, we then realized, are places in which poetic and sonic devices rub up against each other or overlap—the places where we find *turbulence*. **SLIDE 8**

But what has my computer taught me about composition? The phrase “spontaneous overflow” suggests that poems come from within, independent of the poet’s volition. My experience is different, in a way this project has helped me to bring to mind. I don’t wait for words that express my emotion or experience to pop unexpectedly from my internal jack-in-the-box. I attend to the world—poems, newspapers, what my best friend says on the phone—looking for words that create unexpected connections, overlaps, and insights—the turbulence out of which pleasure might arise.

In my most delightful moments with the computer, it shows me relationships among words I might not have noticed (silver and cleaver, in one case; defending and

fiend in another). It not only expands my word store but suggests how various words are playing together and so draws me into their dreaming realm. The tool is not an end; it's only a start. But it starts me in a place newly brought to mind, and changes—not what I do, but how, and how I think about it—and therefore, I guess, in the end, how I do it.

Finally, then, the computer teaches me that the poet and reader play, not the poem. Call the poem the playground, which provides measured space. Only a poet or reader, by activating latent turbulences, can make its ground move and so bring it into temporality. Between readings, the poem lies inert, abandoned outside time; its relationships mean nothing until they are brought to mind.

And the machine? For the time being, I will leave that to Julie.

The lessons my computer has taught me about poems fall roughly into two categories: first, theoretical insights relating across several poems or to poetry broadly, and second, textual discoveries about particular poems. Each category includes things related to sonic turbulence and temporality.

But the very first thing my computer taught me about poems was that it reads differently than I do—that in fact, it probably didn't even know what a poem is or that poems differ at all from, as one of our collaborators put it, “bags of words.” This is an extreme example of something Kate alluded to and that we tend to take for granted: that poems are “remade” in each act of reading. The question of what or how a computer “reads” or “remakes” a poem is one I continue to ponder and that is leading me toward new ideas about what reading entails, even for a human being. I don't have time to begin delving into those here. Still, the practical lesson I learned at the outset was that before I

could expect my computer to teach me new things about specific poems, our team would need to teach it how to shape and communicate its readings in ways that we would find interesting. As with Kate, then, my first computer-related poetic insights came not from machine or tool but rather through the mutual education that we, our computer scientist colleagues, and our computers engaged in together. I left our first team meeting fixated on Min's theoretical question about poetic time and on his practical request that we devise a metaphor for poetry to use in our visualization design.

Our metaphor of flow emerged from the interaction between these two questions, along with a related third: what is it about poetic language specifically that helps develop poetic time? Setting aside the ways time might be represented or thematized in literature, I concentrated on how we experience it. If time emerges through movement and rest, I thought, it may be that our most basic, visceral perception of this dynamic in literature—before syntax, before verb tense, before even semantic meaning—occurs through sound. Explicitly sonic and percussive features may formally mark (and thereby create) distinct patterns and exchanges of movement and rest that listeners and readers enter into as participants, together with texts co-constructing the qualitative experience we call poetic time. If this is so, poetic time is distinct not only from dramatic or narrative time, but from poem to poem depending on texts' unique sonic and percussive features—also, as Kate's noted we've subsequently seen—how those features change with respect to emphasis on imagery or lyricism.

Thinking about all this while swimming one day, I observed how even as my movements generated waves, other waves and deeper currents of varying size (from fellow swimmers or rebounding from the water's edge) were also hitting me. This

experience led me to question the common assumption that lyric time embodies or reproduces a single moment isolated from sequential time. I wondered, then, whether a poem might be more like a body of water containing *multiple, overlapping and interacting* waves or flows of time and sound; whether the sensation of suspension we might experience in reading a lyric poem arises not because the poem is temporally simplified, hyper-focused, or detached, but on the contrary because its temporal complexity floods our usual unilinear consciousness of time. Maybe in poetic time the reader, immersed in the fluid space of a given poem, experiences multiple sonic-temporal patterns of varying direction, amplitude, and shape developing simultaneously and in response to her encounter with the text.

I surmised that each pattern of movement and rest—repeating phonemes or sonic clusters, pauses from line breaks or punctuation—creates a temporal flow, some faster or stronger, superficial or deep, than others. Regular meters and set rhyme schemes, for instance, may dominate because they help structure individual lines and create anticipation. Subtle departures (an inverted metrical foot, a slanted rhyme or modulated vowel) increase aesthetic interest partly because they *add dimension* to those strong divisions of time. Moreover, devices like anaphora, alliteration and internal rhymes can create rhyme-based temporal flows distinct from a main end-rhyme scheme. These features might exist as notable but fleeting superficial anomalies or build into recognizable patterns in their own right that move with or against larger temporal structures. The interaction among these several distinct flows creates a poem's dynamic complexity, its "poem space:" moving faster or slower, amplifying or undercutting regular rhythms, converging in passages of particular turbulence. Then, too, a reader

might linger on a given phrase or return to the same lines again and again, adding her own patterns of attentive movement and rest that interact with those in the text. Again, it's not necessarily the most obvious patterns that are most interesting or important, but the changes that emerge through the turbulent interaction among these patterns.

This theoretical apprehension of poetic time as active, dynamic, fluctuating, *unique* has been one of the greatest, if indirect, thing my computer taught me about poems. Our team has been working to describe how this flow metaphor might play out in particular poems, and so to teach the computer how to recognize similar features in other poems. I should emphasize that the images we're sharing with you from Poemage are preliminary prototypes only. We're still developing this tool and working to meaningfully capture even more sonic patterning Using "Night" as our primary example, Kate and I have for instance been noting how repetitions like "breathes, breathes" unsettle the poem's primary forward-moving, rolling tempo. Vowel play and other rhymes bend currents, form eddies, send us back to earlier passages. The long "oh" in "cold remote" stretches to "ooh" in "blue estuaries," and as Kate mentioned, "estuaries" also connects, through its ending "-ies" with "breathes" in its progress toward becoming a tributary of many distinct sonic-temporal flows – including the aforementioned "e/s/t" cluster in "estuaries" that so beguiles us as it gets picked up and tumbled around in an especially lively flow, **SLIDE 9** its phonemes switching order and syllables in "restless," "itself," "inlets," etc.—persisting (though not yet captured) when a stray phoneme momentarily separates them, as in "reflects." The requirements of this project have pushed us to notice, and want to visualize, the ways this "e/s/t" flow's internal turbulence also relates to and fuels others ("a/s/t" in "stars," "i/s/t" in "lights")—even, through vowel shift, inserted



phonemes, and word break—“cloudless nights.” It’s exciting to be coming closer to our goal. You may have noticed that the aesthetics of “flow” representation in Poemage is conveying more of a sense of temporal dynamism and multiplicity within the poem’s print layout than PoemViewer, with its default view of single, continuous line and bracket arches, was able to.

It’s even more exciting to be moving into a new pedagogical relationship with my computer, the teaching beginning to occur in both directions. Now that Poemage is maturing, it’s becoming a genuine fellow reader, able to reveal new literary insights. **SLIDE 10** Notice for example how none of the sonic-temporal flows in Williams’s poem, “This Is Just To Say” involves the pronoun “you.” The second-person addressee and recipient of the apology remains sonically and temporally (relationally) separate from the rest of the poem, isolated in its own stillness. This is the kind of thing I would not have learned without my computer, and which even in this development stage is contributing to my literary understanding, textual interpretations, and play.

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