White Paper

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Project Director: Miriah Dawn Meyer

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White Paper
HD-229002-15
Poemage Prototype
PIs: Dr. Katharine Coles and Dr. Miriah Meyer
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Narrative

We have successfully created a working prototype of Poemage, a visualization system that uses dynamic, interactive images of a poem's sonic operations to reveal subtle relationships among features in the poem and provides a flexible framework within which scholars can pursue individual research interests through poetic encounters. In addition, our poets and poetry scholars have begun to prepare for implementation by using the tool in both scholarly and creative endeavors and presenting the creative works and literary scholarship in venues that focus on these in addition to or, in some cases, rather than technical accomplishments. This is in keeping with our central and ongoing goal that Poemage should not only break ground technically but also and especially that it should be useful for, and used by, researchers whose main focus and interest are directed not at technology but at poems.

As outlined in our proposal, we adopted a *user-centered, highly interactive design study process . . . to develop and evaluate multiple prototypes ... allow[ing] us to experiment with and refine our visualization techniques and interface.*

Pursuing our goal *to create visualizations that present complex data in ways that are intuitive and revealing*, we explored various methods of visualizing the changeability, uncertainty, and interaction of sonic "flow" in poems and in the reading experience. Through a series of technology probes, we identified which sonic features we most wanted to begin visualizing, and how. This process helped us develop both a formalism for analyzing sonic devices in English-language poems ("RhymeDesign"—see below), and methods for visualizing a poem's sonic topology. Elements of our software application currently available on our project website (www.poemage.org) for PC and MAC users include such features as:

- Three linked views: 1) a set view that allows users to browse sets of words linked through sonic and linguistic resemblances; 2) a poem view that allows users to explore sonically linked words directly via the text; and 3) a path view that shows the sonic topology of a poem. This triptych supports flexible reading processes as users switch their focus among these approaches.
- "Shuffle" and "Show Uncertainty" buttons to reveal alternate patterns and relationships depending on ambiguous pronunciations of a given word.
- "Show Words" and "Show Context" buttons to display words included in a visualized set and words immediately surrounding that set.
- Bezier curves and semi-transparent fill lines to show not only how a particular sonic path flows through the space of a poem, but also to begin displaying that movement in relation with other sonic patterns in the poem (e.g. intersecting, overlapping, merging, diverging, or emerging). During our experiments extending Poemage into 3D (see below), we blended edges of these bezier curves in an effort to begin rendering the variable intensities and directions of these interactions—an aspect we hope to continue refining in subsequent 2D versions of Poemage.
- Invitation to users of diverse technological expertise to customize Poemage according to their unique literary interests. Aside from changing the underlying code itself, less technologically-inclined users may write customized searches through the simplified RhymeDesign notation. Even the most basic means of customization—loading poems of the user's own choosing—provides significantly more flexibility than manually-coded poetry visualization programs.

- Note: In addition to continuing to refine our interface and visualization techniques in response feedback from a growing number of beta testers, we plan to build Poemage's capacity to support new areas and avenues of study. For instance, we still plan to connect sonic patterning to semantic meanings in order to explore more poetic devices, such as pun, tone, and eventually metaphor. We also plan to explore links between reading and creativity by helping users navigate from reading an existing poem to writing a new one. Finally, we are developing a web-version of the tool, which will facilitate the broader use of Poemage as well as the seamless integration of new features (such as those described above).

Our proposal laid out the following work plan:

May 2015: Meet once with core and once with expanded team to design questionnaires for prototype users to respond to.
June-July 2015: Investigate various techniques for visualizing "flow." Meet at least four times with core team to identify and refine potentially exciting techniques for our purposes.
July-August 2015: Rapidly develop multiple prototypes and present them to poets and readers in a series of 4-6 meetings. Gather responses both to interface and to tool capabilities.
September 2015: Correlate user responses. Create a plan to adjust and adapt existing prototypes.
October-November 2015: Adapt prototype interfaces; add capabilities where desired and practical. Present adapted prototypes to poets and readers in 2-4 meetings.
November: Meet at least twice with core group to make final decisions about the prototype interface and tool capabilities.
December 2015: Create final prototype design.
Winter 2016: Begin public implementation.

As noted, we met regularly to design and develop the technology probes that successfully led to our completed prototype. Since submitting our Start Up Grant application, we have continued to present our ongoing research in both technical and literary venues. In preparation for full implementation of Poemage in the literary community, Investigator Gonnering Lein has been preparing an in-depth theoretical paper for submission, and PI Coles has made presentations at national and international literary venues focused primarily not on the technology itself but on showing how she has used it to transform her literary scholarship:

- Katharine Coles and Julie Gonnering Lein each published essays in *Western Humanities Review* (Fall 2014):
  - K. Coles, "Slippage, Spillage, Pillage, Bliss: Close Reading, Uncertainty, and Machines."
  - J. Gonnering Lein, "Sounding the Surfaces: Computers, Context, and Poetic Consequence."
- J. Gonnering Lein presented "Digital Humanities and Dickinson's 'Tell': Recounting Poetic Encounter." *New Work on Dickinson: Flash Talks*. Modern Language Association Vancouver, BC. January 2015.
- Nina McCurdy received a National Science Foundation Graduate Research Fellowship based on her research, including her work on Poemage. This fellowship began in Spring 2016.

- J. Gonnering Lein moderated and participated in *Computers in my Classes: A Pedagogy Round-Table on Workshopping (With) the Digital*. Association of Writers & Writing Programs. Minneapolis, MN. April 2015.
- N. McCurdy presented "Visualizing the Sonic Topology of a Poem." CRA-W Grad Cohort Workshop. San Francisco, CA. April 2015.
- N. McCurdy, Vivek Srikumar, and Miriah Meyer presented "RhymeDesign: A Tool for Analyzing Sonic Devices in Poetry." Computational Linguistics for Literature. Denver, CO. June 2015. (With published conference proceedings).
- N. McCurdy and K. Coles gave a hands-on demonstration of Poemage at the Entrepreneurial Faculty Scholars Annual Retreat, University of Utah, October 2015.
- N. McCurdy, J. Gonnering Lein, K. Coles, and M. Meyer presented "Poemage: Visualizing the Sonic Topology of a Poem." IEEE VIS. Chicago, IL October 2015. (With published journal article).
- N. McCurdy, J. Gonnering Lein, and Amanda Hurtado presented "Deep in Poetry: Improvisations in Tech, in Text, in Time." IEEE VISAP. Chicago, IL. October 2015.
- K. Coles presented "Poetry and Exploration: In Motion in the Machine" at the International Poetry Studies Institute Poetry in Motion conference, Canberra, October 2015
- K. Coles presented "Ghost (in the) Machine" as a keynote address at the Australasian Associated Writing Programs Annual Conference, Melbourne, October 2015.
- K. Coles and N. McCurdy participated in the panel, "Developing and Sustaining Collaborative Research in the Humanities." Modern Language Association. Austin, TX. January 2016.
- K. Coles presented "I Don't Care About Data." Data-Driven Research in the Social Sciences and Humanities—Increasing Research Potential through Interdisciplinary Working. Panel Discussion. "Round Three" Digging Into Data Challenge Conference. Glasgow, UK. Jan. 2016.
- N. McCurdy presented "The Poemage project: exploring the true value of computation to poetry scholarship." DH U1: The First Utah Symposium on the Digital Humanities. Utah Valley University. Orem, UT. Feb. 2016.
- K.Coles presented "Show Uncertainty" in the Works in Progress Series at the Tanner Humanities Center, March 2016.
- K. Coles presented "Tricks of the Senses" on the panel The Lyric in a Non-lyrical Age." Make Every Word Hurt: Prose poetry, the Lyric, and Creative Culture Symposium. Winchester, UK, June, 2016.
- N. McCurdy presented "Making Poemage." The Critical Visualization Event. GC, CUNY. New York, NY. June, 2016
- K. Coles, by invitation, is developing for print publication in Australia her talks, "Poetry and Exploration: In Motion in the Machine" (International Poetry Studies Institute Poetry in Motion conference, Canberra); and "Ghost (in the) Machine" (Keynote, Australasian Associated Writing Programs, Melbourne).
- J. Gonnering Lein, N. McCurdy, and A. Hurtado developed their IEEE VISAP presentation into the paper "Deep in Poetry: Visualizing Texts' Sonic Depth in 3D." It is forthcoming from *Leonardo Journal*.

In addition to these papers and presentations, we have continued our research in preparation for implementation:

- Aside from conducting informal tests and beginning to plan user studies of Poemage, we have embarked on related preliminary testing regarding sound in poetry. Specifically, we launched a pilot study to gather data from poets and poetry scholars about how they perceive sound in poems and how it contributes to their productive readings. Results from this formative study are leading visualization researchers M. Meyer and N. McCurdy to re-evaluate typical methods of rigor and evaluation within their discipline, prompting them to explore and develop new theoretical and methodological frameworks appropriate to humanities research.
- In line with current research in computational creativity, we are in the preliminary stages of a new project, in collaboration with V. Srikumar, aimed at developing an interactive environment which employs semi-supervised machine learning techniques to enable the creative exploration of the large-scale sonic topology of a poem. This project continues to investigate the role and impact of technology in and on poetry scholarship, and could have profound implications for creativity support in the digital humanities and beyond.
- Pursuing experiments begun for VISAP, J. Gonnering Lein and A. Hurtado are developing 3D visual poems and text-based images to submit to literary journals and exhibit in art shows.
- Our entire team continues to develop papers and poems on an array of subjects related to the next phase of our collaborative research. For instance: our core group plans to draw from our experience creating Poemage to co-author papers on aesthetics, replication, and collaboration; both K. Coles and J. Gonnering Lein are using the software to write and revise poems; K. Coles devoted her spring 2016 faculty fellowship at the Tanner Humanities Center to creative and scholarly efforts linked to Poemage and has continued to write scholarly papers on poetry based on these efforts; J. Gonnering Lein is completing a project-related theory paper addressing computer-human-literature interaction, including modes of creativity.

Appendices

Publications:

Project Website: www.poemage.org Introduction, video demonstrations, software downloads, project bibliography, and links to published papers.

Papers (available for download at www.poemage.org):

Coles, K. "SLIPPAGE, SPILLAGE, PILLAGE, BLISS: Close reading, Uncertainty, and Machines." *Western Humanities Review*. 68:3 (2014): 39-65.

Gonnering Lein, J. "Sounding the Surfaces: Computers, Context, and Poetic Consequence." *Western Humanities Review*. 68:3 (2014): 84-109.

McCurdy, N., V. Srikumar, and M. Meyer. "RhymeDesign: A Tool for Analyzing Sonic Devices in Poetry." *Proceedings of the Fourth Workshop on Computational Linguistics for Literature*. The Association for Computational Linguistics (2015).

McCurdy, N., J. [Gonnering] Lein, K. Coles, and M. Meyer. "Poemage: Visualizing the Sonic Topology of a Poem." *IEEE Transactions on Visualization and Computer Graphics*. (Proceedings of InfoVis2015) 22:1 (2016): 439-448.

Coles, K. "Poetry and Exploration: In Motion in the Machine." *Proceedings of the International Poetry Studies Institute Poetry in Motion Conference*. Forthcoming.

Gonnering Lein, J., N. McCurdy, and A. Hurtado. "Deep in Poetry: Visualizing Texts' Sonic Depths in 3D." *Leonardo Journal*. Forthcoming.

Media:

Data Stories Visualization Podcast: "68| Poemage: Data Visualization for Poets with Miriah Meyer and Nina McCurdy." February 24, 2016. MP3 and Transcript available at: http://datastori.es/68-poemage/