

Increasing the Visibility of AI Digital Humanities Projects

Jon Chun
Kenyon College

2024 MLA Annual Convention
January 4th-7th 2024 Philadelphia, PA
<https://github.com/jon-chun/mla-generative-ai>

Overview

- Introduction
- Human-Centered AI
- Research Methodology
- Information Design & Editing

Introduction

DH@Kenyon



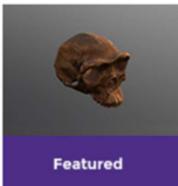
Integrated Program for Humane Studies (IPHS)

Digital humanities at Kenyon encompasses a dual lens. On the one hand, we empower our next generation of thinkers with the conceptual framework underlying our Age of Information — from dataism and algorithmic thinking to synthetic biology and artificial intelligence. Our unique approach to computational thinking positions students to engage with the many practical, theoretical and ethical issues surrounding technological innovation and social change.

DIGITAL HUMANITIES AT KENYON



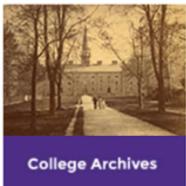




Featured



Student Scholarship



College Archives



Special Collections



Educational Resources



Local History



All Collections

Jenna Nolt

Digital Initiatives Librarian

Campus

Chalmers Library, 314

P [\(740\) 427-5698](tel:(740)427-5698)

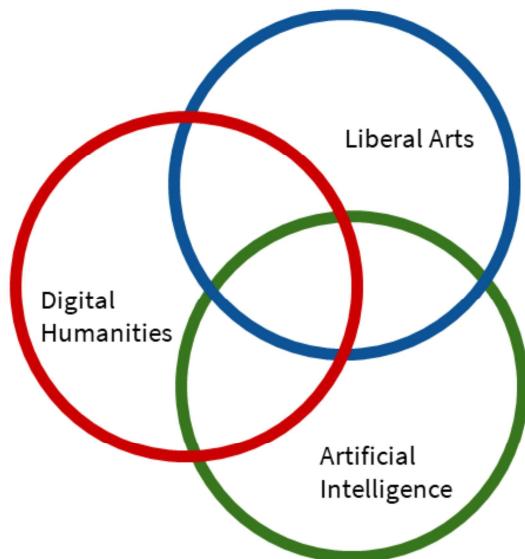
E noltj@kenyon.edu

Human-Centered AI

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Kenyon Digital Humanities K{DH}

Human-First AI Curriculum



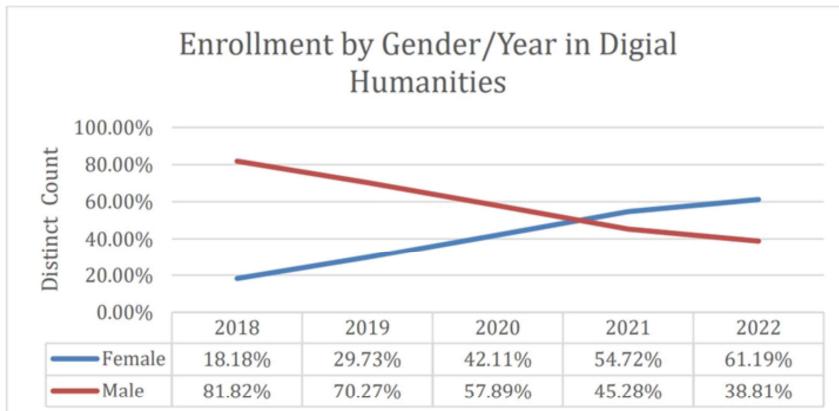
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Digital humanities also explores the most recent computational approaches as a way **to augment — rather than replace — more traditional humanist inquiry**.

Students imagine and pursue new avenues of research by identifying unexplored datasets of text, image and sound, while embracing new computational frameworks that are increasingly powerful and easy to use. We focus on finding **interdisciplinary** solutions to today's challenges.

<https://www.williams.edu/strategic-planning/strategic-plan-2021/>

<https://www.williams.edu/strategic-planning/files/2020/07/Data-Science-and-Digital-Humanities-FINAL.pdf>



- Non-STEM ~90%
- Women 61%
- Latine 11%
- African-American 13%

We serve students who may otherwise feel alienated by traditional CS or AI programs

Programming Humanity		2018	2019	2020	2021	2022
Non-Stem Major		93%	80%	95%	91%	91%
Stem Major		7%	20%	5%	9%	9%

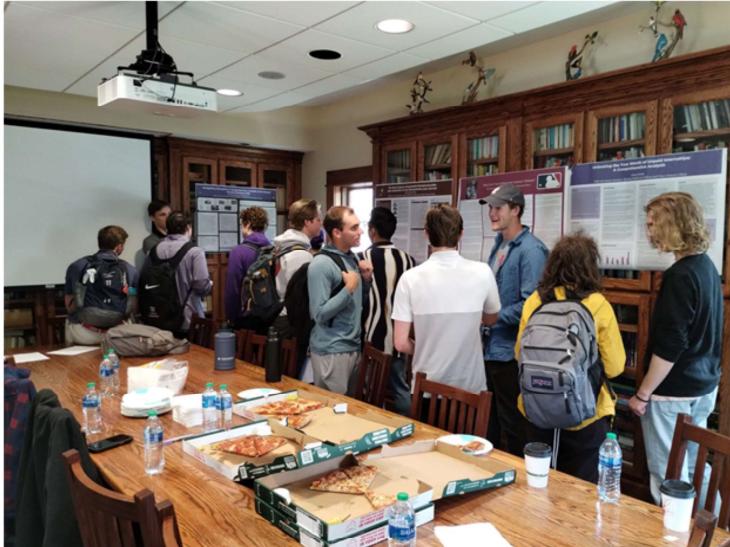
Goals & Outcomes

- Intellectual Framework
 - Key Abstractions
 - Many Model Thinkers
 - Think Critically & Thrive
- Synthesize/Applied Humanities
 - Find Stories in Data & Visualize
 - Testable Theories
 - Operationalize & Effect Change
- Grad School / Opportunities

Research Methodology

—

Poster Sessions



AI Research Paper

Attention Is All You Need

Ashish Vaswani*
Google Brain
avaswani@google.com

Noam Shazeer*
Google Brain
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Niki Parmar*
Google Research
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Jakob Uszkoreit*
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Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We show that a model can learn to translate without an encoder, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.0 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature.

1 Introduction

Sections	What to do?
Abstract	Write 150 words on the purpose of the study, research questions or suggestions, and main findings with conclusions.
Outline	Organize the map of the study.
Introduction	Provide the main information on the problem statement, the indication of methodology, important findings, and principal conclusion.
Literature Review	Analyze and incorporate scholarly sources on past studies.
Methodology or Materials and Methods	Explain the design of the research with techniques that are used for gathering information and other aspects related to the experiment.
Results	Present and illustrate the obtained findings.
Discussion	Review the information in the introduction part, evaluate their gained results, or compare it with past studies.
Recommendations	Propose potential solutions or new ideas based on the obtained results.
Limitations	Consider the weaknesses of the research and results to get new directions.
Conclusion	Provide final thoughts and the summary of the whole work.
Acknowledgments or Appendix	Include additional information on the research paper if it is necessary.
References	Provide and cite all used sources in the study.

<https://wr1ter.com/research-paper>

<https://wr1ter.com/research-paper>

AI Research Poster

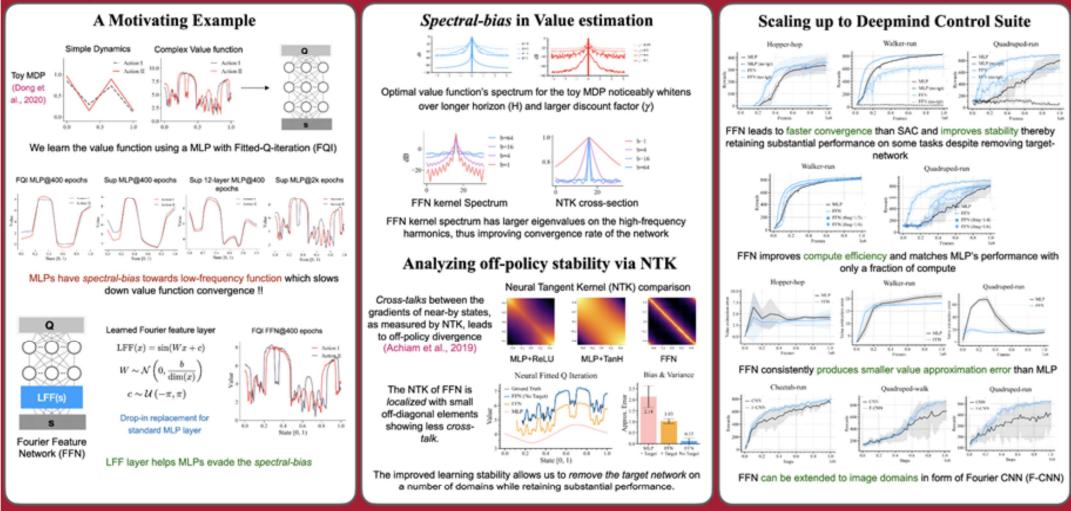
MIT Overcoming the Spectral-bias of Neural Value approximation

Ge Yang*, Anurag Ajay*, Pulkit Agrawal



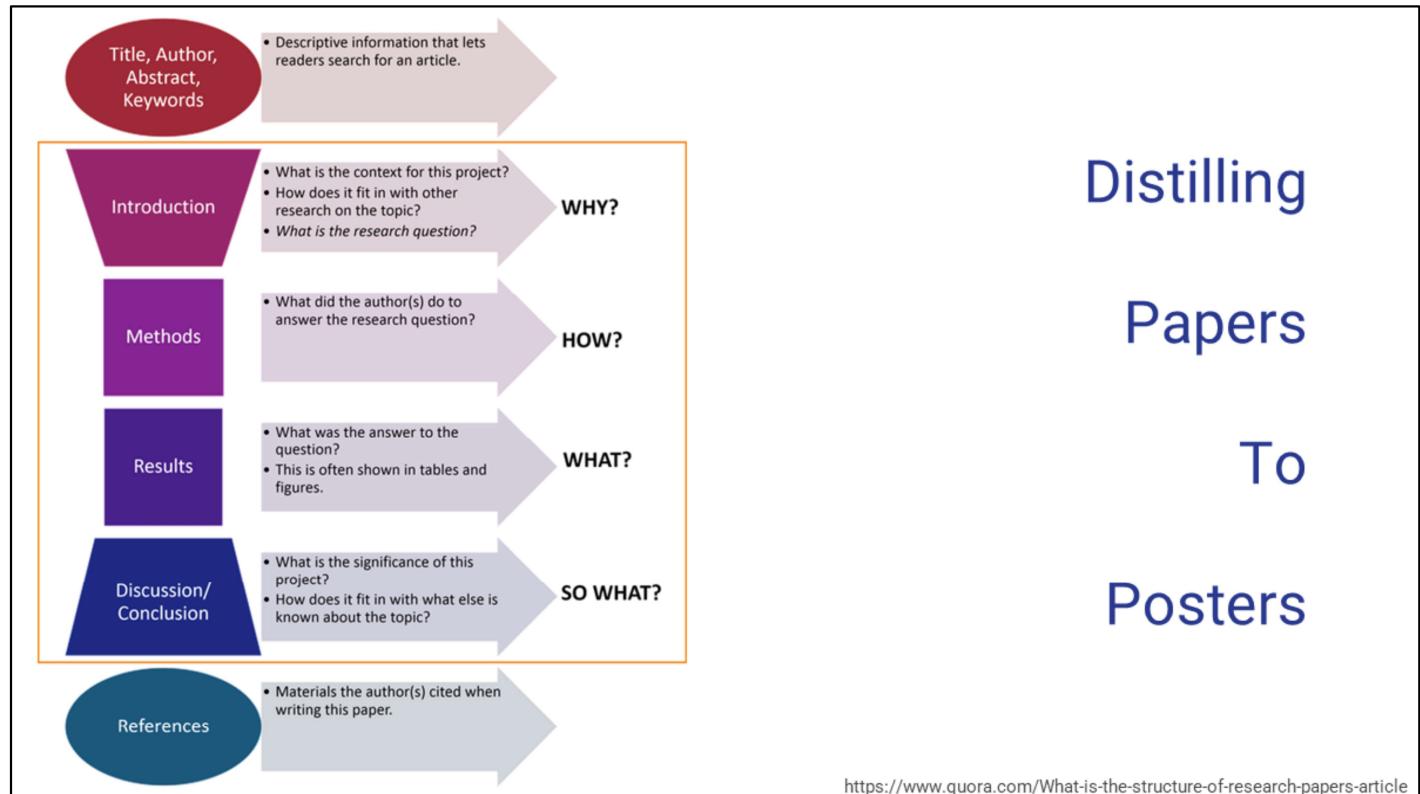
Improbable AI Lab, NSF AI Institute for Artificial Intelligence and Fundamental Interactions (IAIFI), MIT CSAIL, (*) denotes equal contribution

Spectral-bias in MLPs slows convergence in Neural Value approximation and causes instability in off-policy RL



<https://cap.csail.mit.edu/student-poster-presentations>

<https://cap.csail.mit.edu/student-poster-presentations>



<https://www.quora.com/What-is-the-structure-of-research-papers-article>

Process to Write A Good ML Research Paper



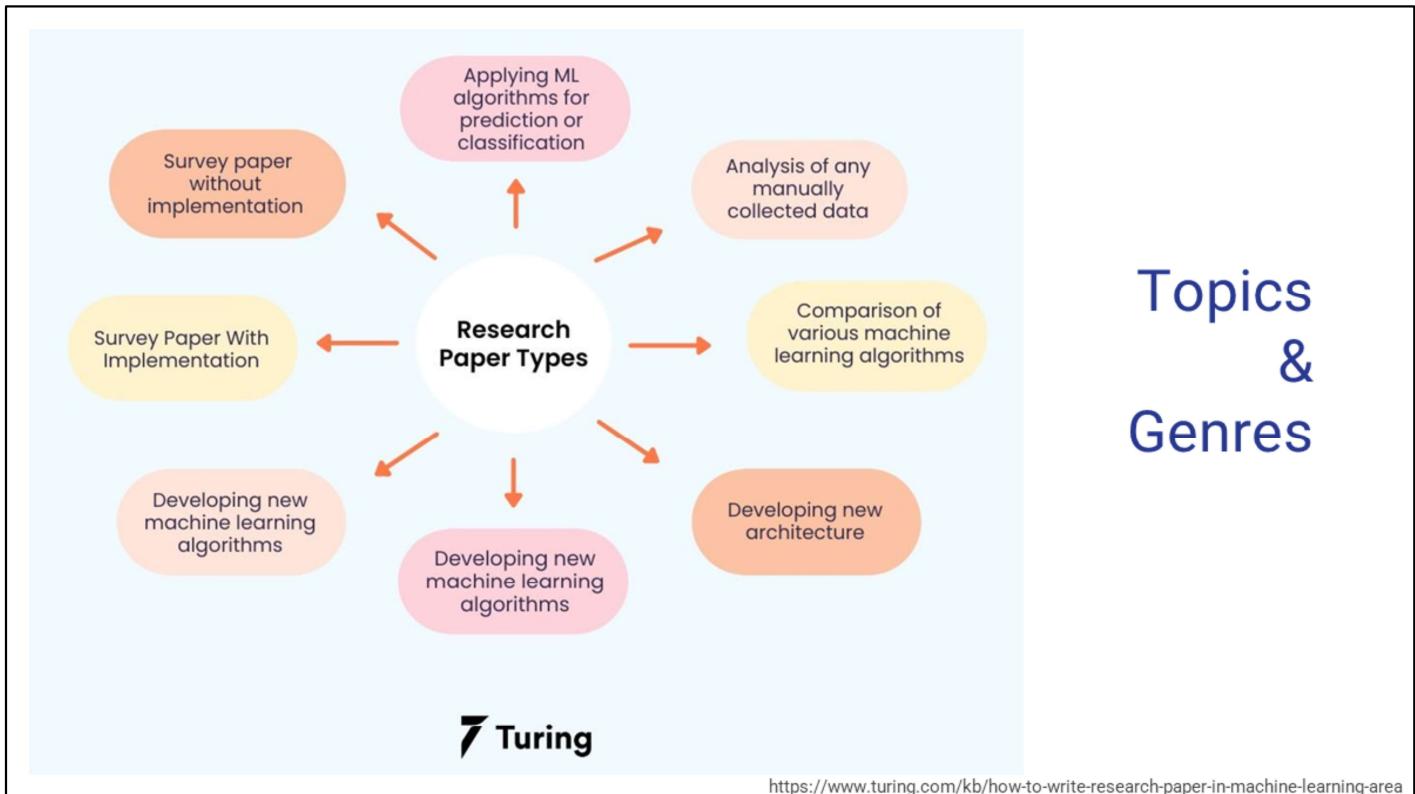
A
New
Writing
Process



<https://www.turing.com/kb/how-to-write-research-paper-in-machine-learning-area>

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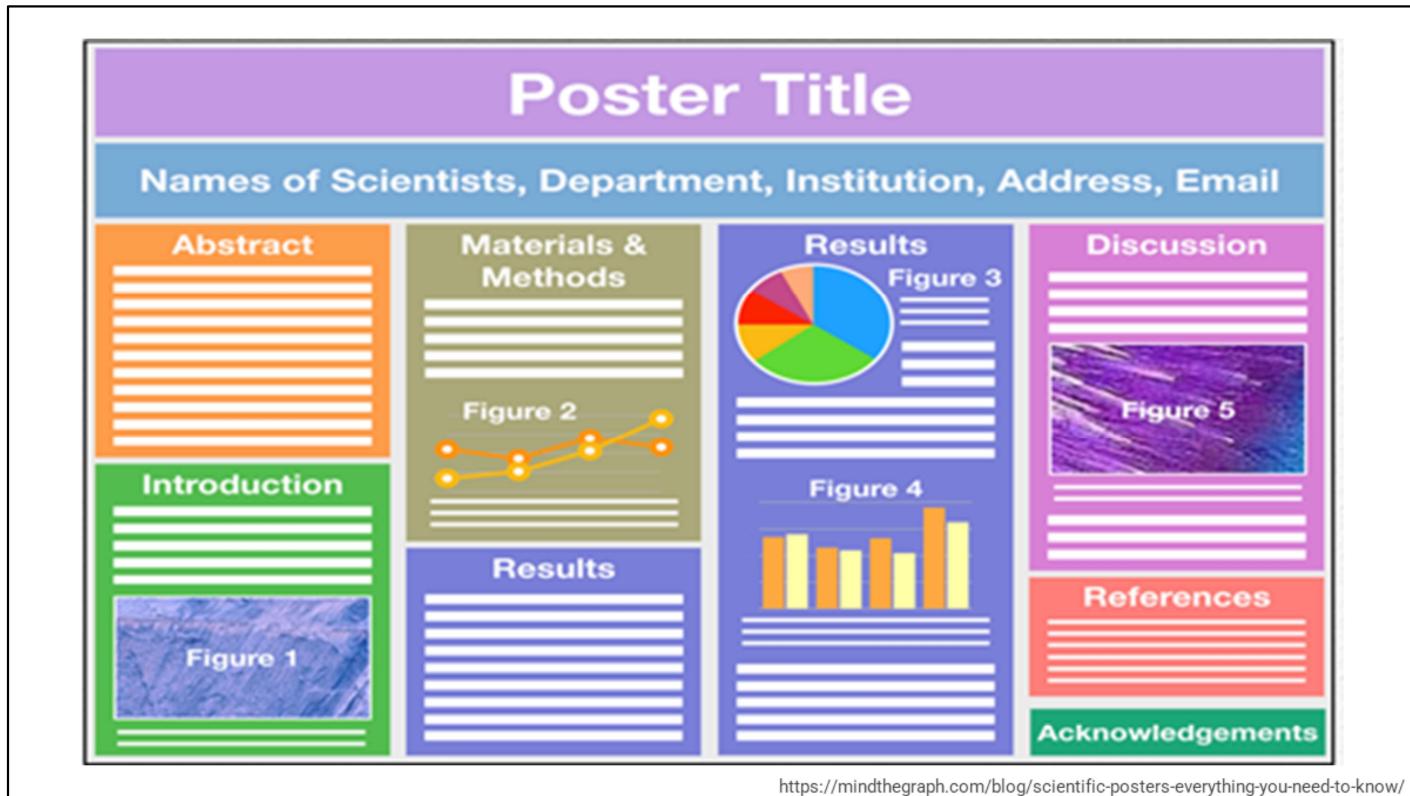
Topics & Genres



<https://www.turing.com/kb/how-to-write-research-paper-in-machine-learning-area>

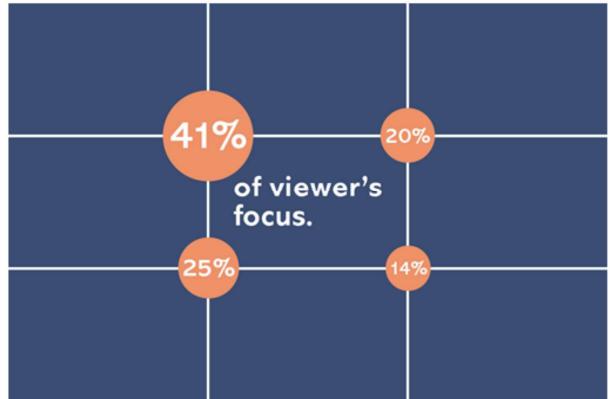
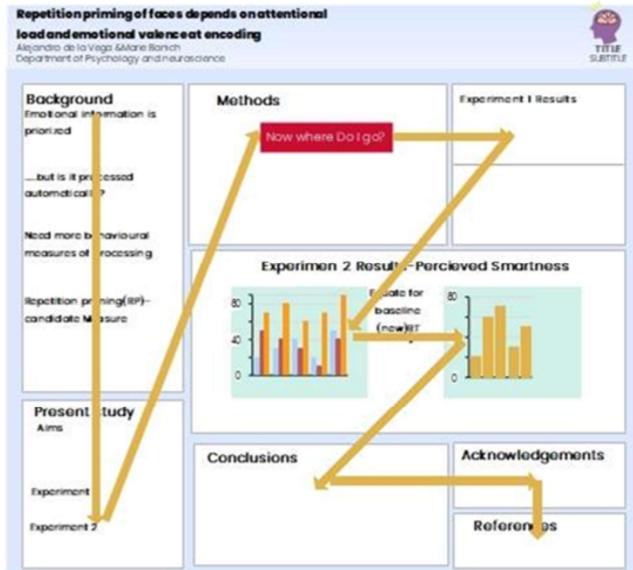
Information Architecture & Editing

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<https://mindthegraph.com/blog/scientific-posters-everything-you-need-to-know/>

Psychology & Information Architecture



<https://www.edrawmax.com/article/what-is-research-poster.html>

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CONTRAST 	BALANCE 
EMPHASIS 	REPETITION 
PROPORTION 	HIERARCHY 
RHYTHM 	PATTERN 
WHITE SPACE 	MOVEMENT 
VARIETY 	UNITY 

Graphic Design Principles

 Key parts of a scientific poster

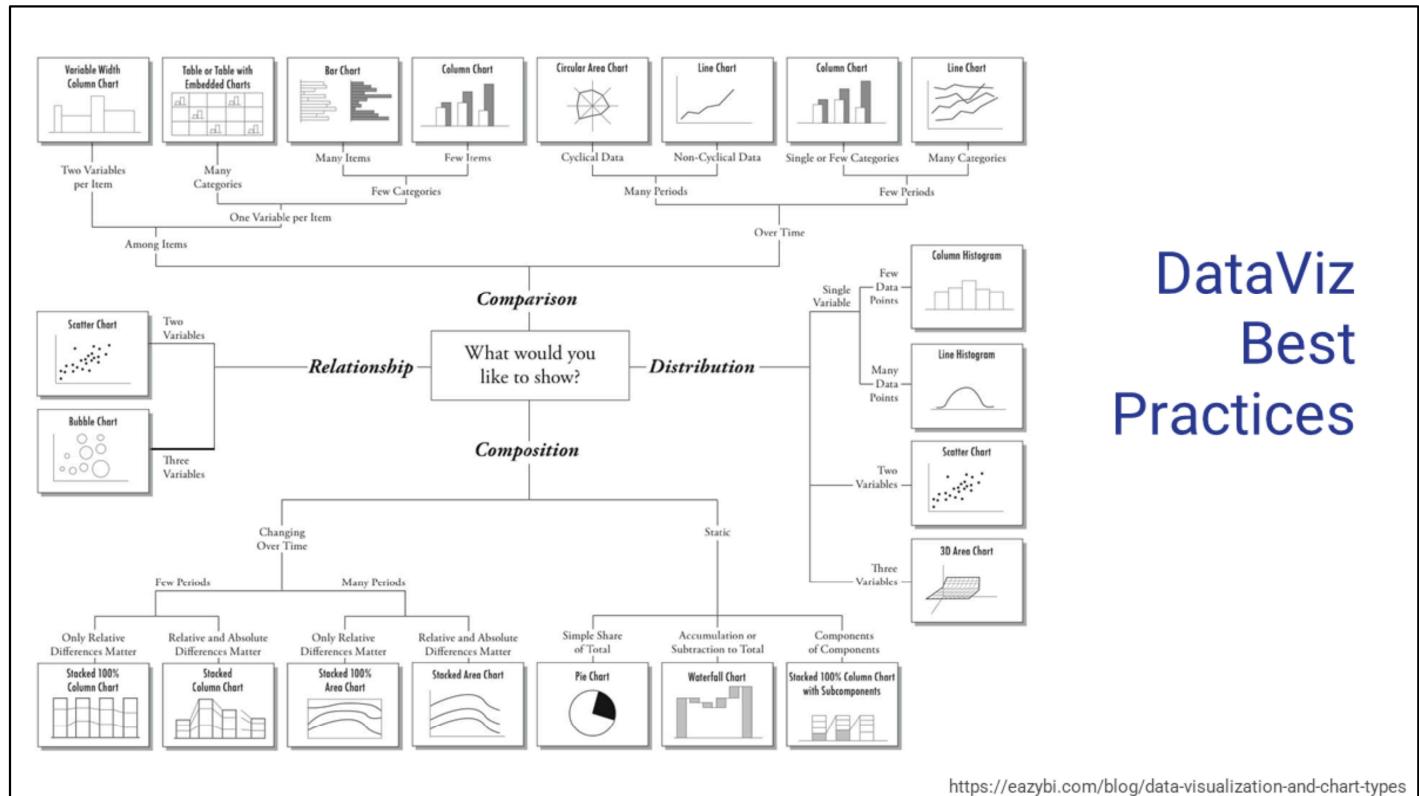
 <p>Content: Only include information that supports the take-home message of your research.</p>	 <p>Layout: Poster sections should have a logical visual flow, with ample white space between elements.</p>
 <p>Typography: Choose large font sizes so that the text of the poster is easy to read.</p>	 <p>Colors: Help the viewer make contrasts by choosing colors carefully.</p>
 <p>Images and Illustrations: Use good quality images with high resolution.</p>	 <p>Design: Choose one design tool to avoid formatting errors.</p>

<https://paperpile.com/g/scientific-poster/>

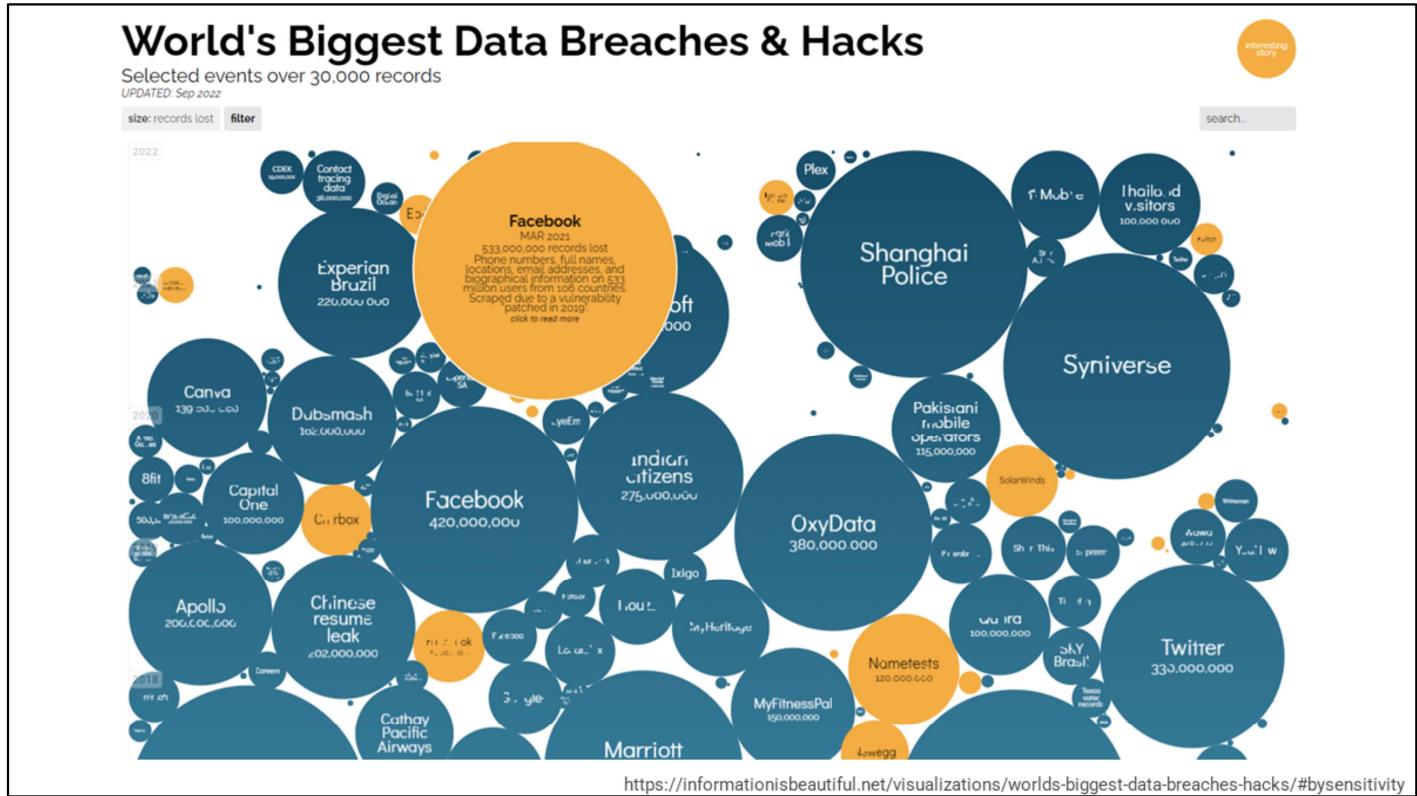
<https://www.zekagraphic.com/12-principles-of-graphic-design/>

<https://paperpile.com/g/scientific-poster/>
<https://www.zekagraphic.com/12-principles-of-graphic-design/>

DataViz Best Practices



<https://eazybi.com/blog/data-visualization-and-chart-types>



Infographic Makeovers

BEFORE

AFTER

- △ LAYOUT
- COLOURS
- WHITESPACE
- ▲ TYPOGRAPHY
- ◆ INFORMATION HIERARCHY
- ◆ DATA ANALYSIS
- ◆ DATA GROUPING
- ◆ FILTERS
- ◆ HOVERS
- ◆ ICONS



<https://www.datalabsagency.com/2023/07/06/brand-guidelines-for-data/?v=7516fd43adaa>

<https://www.datalabsagency.com/2023/07/06/brand-guidelines-for-data/?v=7516fd43adaa>

(i)

Human-Centered AI

VS

STEM

1. Title and Introduction:

- **Interdisciplinary Title:** Unlike typical STEM titles, which are often highly technical, titles for human-centered AI research should *balance technical accuracy with an understanding of social or cultural context*. For instance, "Analyzing Social Media Sentiment Pre-Economic Crisis in Sri Lanka: A Human-Centered AI Approach" bridges technical and contextual aspects.
- **Broader Research Question:** These questions should encompass both the *technical and humanistic elements*. For instance, "How can AI-driven sentiment analysis provide insights into socio-economic conditions?" reflects both AI and societal concerns.

2. Overall Writing Style:

- **Balanced Technical and Humanistic Language:** Human-centered AI research demands a *blend of technical language and narrative styles* that *reflect human experiences and societal impacts*, more so than typical STEM research which might focus solely on technical aspects.
- **Cultural and Ethical Considerations:** *Explicitly discuss the cultural, ethical, and societal implications* of the research, a facet often less prominent in standard STEM posters.

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3. Organization and Layout:

- **Interdisciplinary Sections:** In addition to the standard sections (introduction, methods, results, conclusion), include sections on ethical considerations, societal impact, or cultural relevance.
- **User-Centric Design:** Design the poster with a focus on accessibility and inclusivity, reflecting the human-centered nature of the research.

4. Data Visualizations and Graphics:

- **Inclusive and Diverse Visuals:** Use visuals that are not only informative but also culturally sensitive and inclusive, considering the diverse audiences that human-centered AI research addresses.
- **Representative Data Presentation:** Ensure that data visualization reflects the diversity and complexity of human experiences, which is a unique aspect compared to more

straightforward STEM data presentation.

5. Engagement and Interaction:

- **Broader Engagement Questions:** Pose questions that encourage viewers to think about both the technical and humanistic aspects of the research.
- **Interactive Elements:** Consider including interactive elements like QR codes linking to simulations or models, which can provide a deeper understanding of both the AI technology and its human-centered applications.

6. Presentation and Delivery:

- **Interdisciplinary Summary Speech:** Prepare a summary speech that not only explains the technical aspects but also addresses the human, cultural, and ethical dimensions of the research.
- **Empathetic Communication:** Emphasize a communication style that is not only clear and concise but also empathetic and inclusive, reflecting the human-centric nature of the research.

(ii)

Human-Centered AI

VS

STEM

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(iii)

Human-Centered AI

VS

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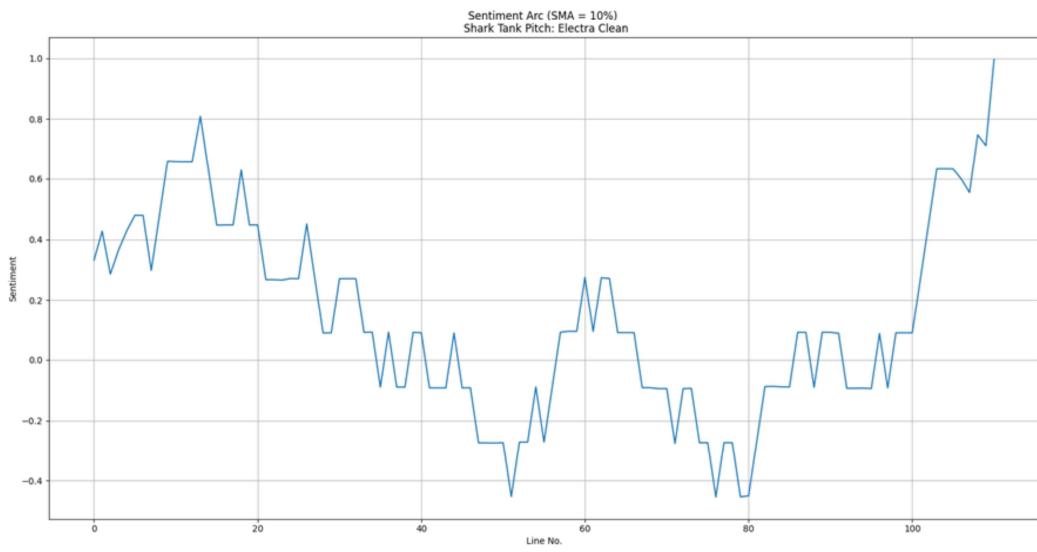
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Examples

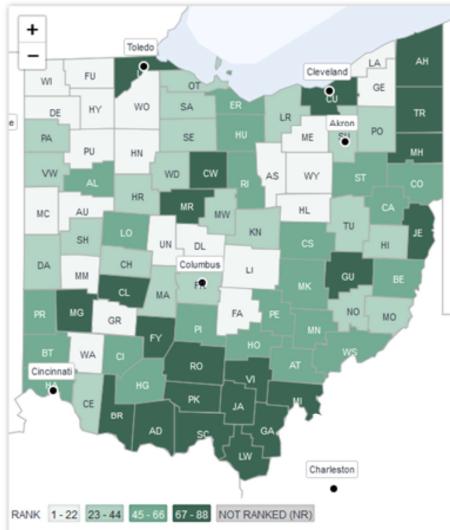
- Papers
- Websites / Blogs
- Plays
- Films
- Art Installations
- Gallery Designs
- Community Engagements
- Independent Research
- Internships / Jobs
- Startups
- Guest Speakers
- Campus Roundtables

Shark Tank Pitch: Alexander Gow

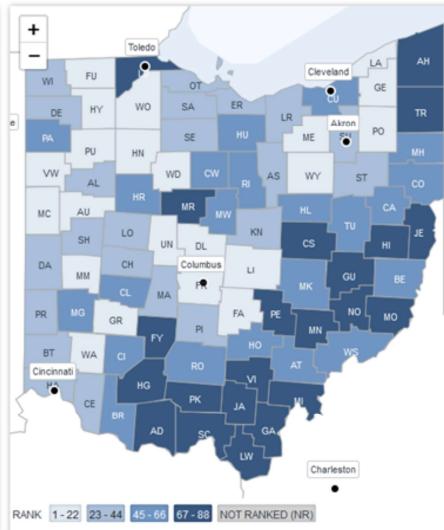


Ohio Opioid Crisis: Zach Elsawy

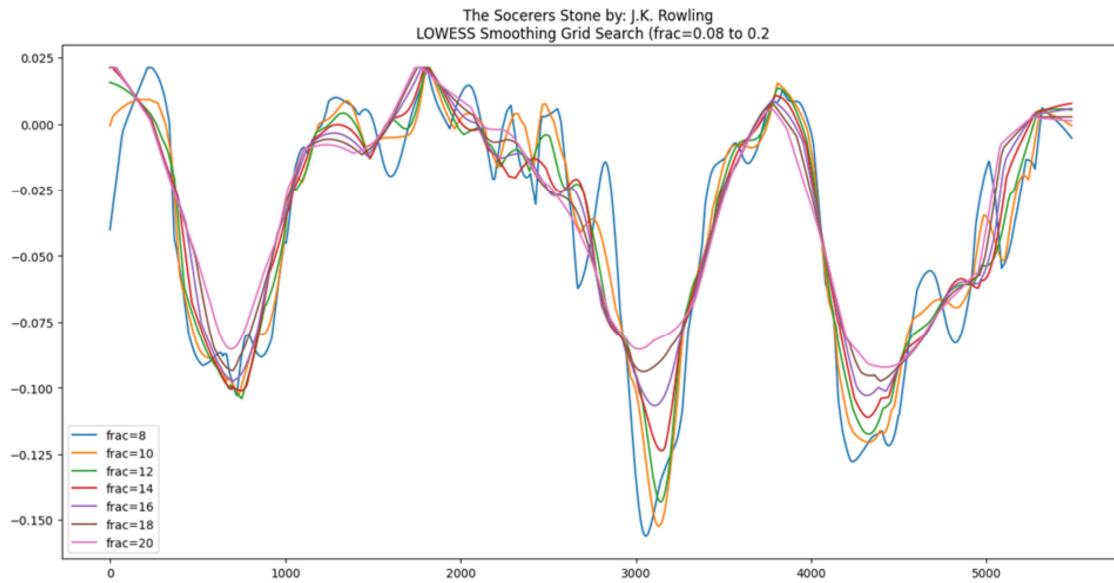
Overall Rankings in Health Outcomes ⓘ



Overall Rankings in Health Factors ⓘ



Harry Potter Screen Adaptations: Erin Shaeen



Generative AI Art & Design: Jill Noorily



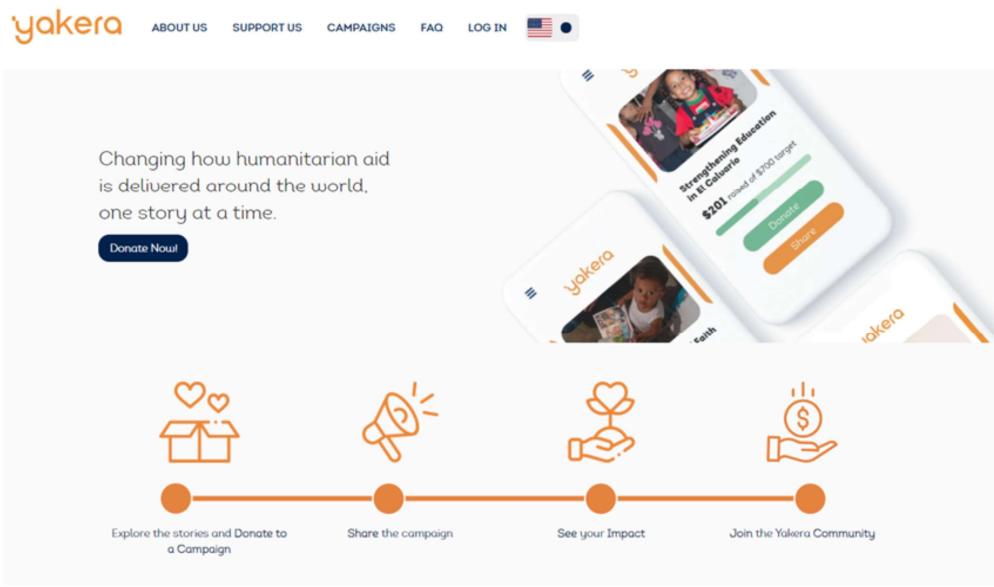
Sponsored by Integrated Program in Humane Studies, Art History, and Studio Art

HOW AI IS CHANGING ART, DESIGN, AND MUSEUM CURATION

October 26, 2021 11:10AM-12:00PM

Community Foundation Theater

Yakera: Raul Romero & Tomas Munoz Reyes



The screenshot shows the Yakera website homepage. At the top, there is a navigation bar with links for "ABOUT US", "SUPPORT US", "CAMPAIGNS", "FAQ", "LOG IN", and a language selector (US English). Below the navigation, a main headline reads: "Changing how humanitarian aid is delivered around the world, one story at a time." A "Donate Now!" button is visible. To the right, a smartphone displays a campaign page titled "Strengthening Education in El Calvario" with a progress bar showing "\$201 raised of \$700 target". Below the phone, four orange circular icons represent different actions: "Explore the stories and Donate to a Campaign" (box with hearts), "Share the campaign" (megaphone), "See your Impact" (hand holding a plant), and "Join the Yakera Community" (hand holding a dollar sign).

Changing how humanitarian aid is delivered around the world, one story at a time.

Donate Now!

Yakera

Strengthening Education in El Calvario
\$201 raised of \$700 target

Explore the stories and Donate to a Campaign

Share the campaign

See your Impact

Join the Yakera Community

Doubles and Reflections: Sentiment Analysis and Vladimir Nabokov's *Pale Fire*

Catherine Perloff, Jon Chun, Katherine Elkins
Comparative World Literature Senior Seminar at Kenyon College

Introduction

In his novel, *Pale Fire*, Vladimir Nabokov uses a non-linear narrative composed in three parts: Foreword, Poem, and Commentary, apparently written by two distinct authors, John Shade and Charles Kinbote. Storylines appear to be separate at surface level yet work in interesting ways to create a complex narrative. The Poem and the Commentary arc of a disguised, exiled king, and provides meta commentary on the art of commentary.

The text was tricky to analyze without sentiment analysis principally because of its seemingly disjointed structure. Thus, there's a bit of irony in that we found a repeated structure to the text despite the preconceived notions that the text is "plotless" overall.

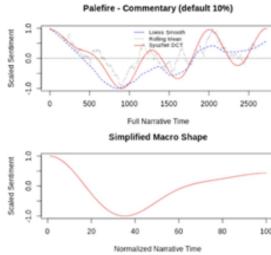
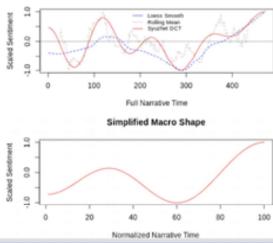
Both the simplified macro structure to the Poem and to the Foreword and Commentary show the "Men in a Holier" narrative model, which illustrates a mirroring or doubling in structure between the Poem and the Commentary. The Poem and the Foreword and the Commentary and Poem being mirrors of one another as well, when compared, the two are reflections of one another in terms of structure. This was not apparent prior to sentiment analysis and is important, as it mirrors the reflective nature of the text.

Methodology

After cleaning the text, we used the Syuzhet and Sentiment R packages in R to plot the emotional valence of *Pale Fire* over narrative time. We plotted the narrative arc using a DCT with a low pass of 10, a Loess smoothing model, and a rolling mean of DLT.

Syuzhet and Sentiment sentiment analysis were used to map the narrative arc of *Pale Fire*. We first ran the full text through Syuzhet and SentimentR, then isolated the poem from the rest of the text. We then ran the poem through Syuzhet and SentimentR again. We did this to see if the narrative arc matched an already established narrative arc and to explore high and low emotional valences. We then merged more traditional literary analysis with these new tools, we looked at the emotional peaks and valleys and used thematic analysis to uncover possible connections between the Foreword, Commentary, and Poem.

Palefire - Poem (default 10%)



Nabokov Scholarship

We first looked to relevant secondary reading and scholarly articles on Nabokov and *Pale Fire*. Much of the literary scholarship on *Pale Fire* concerns the novel's authorship, which was not relevant to this project, but some of the articles proved vital resources.

In Nabokov's *Pale Fire: The Magic of Artistic Discovery*, author Brian Boyd establishes his thesis that there are connections made between the Foreword and the Poem and the Poem and the Commentary. In the narrative, he asks the reader to jump back and forth, as well as appearing to be nothing, actually lead to discovery and understanding. Readers should, therefore, trust in their curiosity to "follow the trail." As for the poems, they will be with the same reader who has been reading the Poem and the Commentary. In "Shade and Shape in *Pale Fire*", Boyd argues that the echoes and patterns of *Pale Fire* do indeed interlock into a Nabokovian "key" that will, when found and used, unlock the novel's secrets. In the Poem, he again, however, focuses on authorship instead of delving deeper into these "keys."

In "Bolt from the Blue," Mary McCarthy attempts to untangle the tricks and riddles within *Pale Fire* by picking apart the text and finding keys to understanding connections. In this way, she goes beyond Boyd in her analysis of the poems, by identifying them as "keys" to the novel. She also identifies the connection between the three sections to the novel. She argues that there are multiple levels to the novel, "planes in fictive space," and likens the novel to a chess game, a "mirror-game." She believes that the "real," "real" story underneath can be accessed by the attentive reader and that the novel is a "game" of mirrors, and reflections, and that the reader must play it.

Mary McCarthy's article comes closest to understanding of how the novel works at a deeper level instead of focusing on schools of her article, thus, came out in June 1962, far before Boyd's articles. Thus, this kind of analysis of *Pale Fire* has remained unanswered since; there is much that remains to be answered.

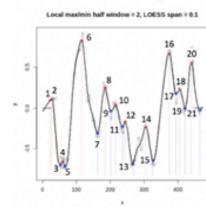
Results

There can be a lot of interpretation with the results. The computer is locating moments of emotional infection and it's our job to ascertain if they're credible by looking at close reading, considering noise, and then considering the plot points as a whole with an underlying structure. And, the emotional valence was determined by humans, as the dictionary being used was created by humans.

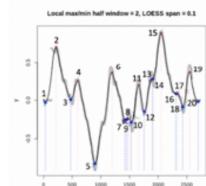
Not all the crux points are talked about here, as some are too noisy for clear analysis and others are on or around the neutral line.

The crux points of the Foreword/Commentary/forward and poem overlap in a few places, whether it be with the same words shared in both graphs or high or low emotional valence points for a single event.

Poem Peaks and Valleys



Foreword Commentary Peaks and Valleys



The crux points 2, 4, 6, and 10 of the Commentary are very close together and illustrate that the poem has both a high and a low emotional valence. Thus, when Hazel goes to the haunted barn and sees the specter "pale light" that she can't quite reach,

There is also doubling occurring within the connection between the Commentary and Poem. The crux point 5 of the Commentary reflects the scene in which Charles, the King of Zembla, is looking into a lake and seeing his doubled reflection. Yet, this reflection is in a different location and formed a different way. As such, this isn't his genuine reflection and illustrates the concept of representation itself.

In its limp tintinnon he saw his scarlet reflection but, oddly enough... this reflection was not as his but much further... his red-watteaned, red-capped double turned and vanished, whereas he, the observer, remained immobile."

This point is linked to crux points 3, 4, 5, and 15 of the Poem, as both occur as the lowest valley, when Shade experiences his seizure:

"And then black night... / That blackness was sublime... / I felt distributed through my body and..."

"And then it turned—me attack, the trance, or one of my old fits... / I can't tell you how I knew—but I did know that I had crossed / The border!"

The seizures cause Shade to experience a separation of self as well and link him and King together / link their experiences together.

These points of doubling are further linked to crux point 19 of the Commentary, when Shade experiences a doubling of self in a sleep state — him seeing himself outside of his body, seeing himself asleep.

Conclusion

This proves to be a good proof of concept for this kind of approach: it makes the case for this kind of analysis. One would normally not expect *Pale Fire* to exhibit a narrative structure, yet it does. So, then the question remains: what does this mean? Is *Pale Fire* not hyperreal, but reflections of the same story? This may be a very different notion of hyperrealism than the one usually implied, but mirrored reflections of one another, as seen in the Results section.

Then begs a larger meta question is there a shared experience in reading? Or are our reading processes totally different from other's reading experiences? Kinbote's reading experience is different from ours, yet his experience mirrors Shade's story through the poem.

As Mary McCarthy stated, "Poe's text is in a mirror world, a world of reflections. Thus, on a meta level, we all read our own story, but our stories are connected. Our stories are all "pale fires" of one another; they're not perfect, nor identical — they're just reflections.

Acknowledgments

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Lost in Translation: Using Sentiment Analysis to Analyze Translations of Homer's *Odyssey*

Erin Shaheen

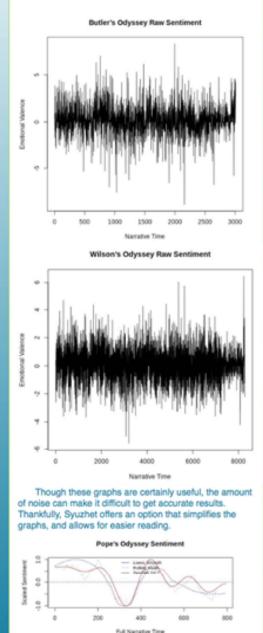
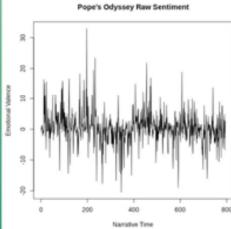
Introduction

For my final project in AI for the Humanities, I knew that I wanted to examine the creative role of translators in classic literature. I ran three different translations through The Odyssey Translation Syuzhet.R, a sentiment analysis tool that has grown increasingly popular in the Digital Humanities field. Syuzhet tracks the emotional arc (also called "sentiment arc") of a text by giving each word a different score. For example, on a scale of -1 to 1, "terrible" might score -1 and "amazing" might score 1. A more neutral word like "okay" would score closer to 0.

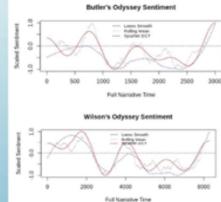
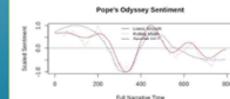
I chose translations by Alexander Pope, Samuel Butler, and Emily Wilson, published in 1725, 1900, and 2017 respectively. I wanted to explore how the translators' working in different time periods and having different life experiences might affect their interpretations of the text.

Methodology

The first thing I did was run the three translations through Syuzhet and look at the raw sentiment analysis. As you can see in the following graphs, Pope's translation is by far the least noisy, followed by Butler's, and then by Wilson's.



Though these graphs are certainly useful, the amount of noise can make it difficult to get accurate results. Thankfully, Syuzhet offers an option that simplifies the graphs, and allows for easier reading.



Once I had made the simplified graphs, I was able to pinpoint what are known as "cruxes," the specific high and low points of emotion in the text. I focused on the Syuzhet DCT line, marked in red, for these graphs.

Interestingly enough, all three of the texts had approximately the same crux point—in Book 11,

when Odysseus sees the ghosts of dead comrades and his recently deceased mother in the House of Hades. I found slightly more variation in the highest points. While both Butler and Wilson's translations mark the highest point as in Book 11 (Odysseus' time spent visiting the home of King Alcinous), Pope marks it as when Odysseus leaves Calypso.

Close inspection of the above graphs reveals that all three them have slight variations in the flow of the text, but only Butler's translation drops before the neutral line. When I pinpointed the cruxes, I found that while Butler and Wilson mark this low point in Book 4, where Telemachus visits Menelaus, Pope, who has the sharpest curve, marks it in Book 6, where Odysseus leaves Calypso.

My initial hypothesis that the sentiment analysis would shift based on translator was correct—but only to a certain extent. While you can see from the graphs that different translations had different highs and lows, the overall arcs remained relatively similar. All three of the translators had the same points of highest positive valence, and while the points of highest valence had more variation, they all involved the theme of hospitality. Pope's translation had the most variations, with the most extreme sentiment appearing at a different crux point (the visit to Eumeaus) and with variations at the beginning of the text.

Conclusion

Syuzhet proved to be extremely useful in tracing the differences between translators. Alexander Pope's work has different crux points than Butler and Wilson's, which coincides with how their graph contains significantly less noise than the others. It's worth noting that his work was originally published in the early sixteenth century, while Butler worked in the eighteenth and nineteenth, and Wilson in the twenty-first.

Samuel Butler's translation has the most negative valence, being the only one to dip below average at the start of the text, and remaining there for the longest amount of time.

I initially selected Emily Wilson's translation because of how recent it was, and the reviews I read online lead me to believe that it drastically differed from previous translations. In terms of Sentiment Analysis, however, Wilson's translation did not provide the closest thing I had to a middle ground between Butler and Pope. Of course, I only looked at the texts through the perspective of Sentiment Analysis, and I only chose three translations out of a large body of canonical works.

If I had the chance to do this project again, with the knowledge I have now, and significantly more time on my hands, I would do a few things differently. First, I would use Syuzhet to analyze more texts to get a larger basis for comparison. Then I'd supplement my work with a variety of other tools, like Voyant, which includes features that note the frequency of words and their connection to each other, and could potentially shed light on the social context of the text. Finally, a more in-depth analysis of the texts themselves, particularly at the crux points I mentioned above, offering a human perspective to compare to the digital ones.

Acknowledgements

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References

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Meditations in an Emergency: a Regional Analysis of the Relationship Between Union Membership and Minimum Wage in an Age of Labor

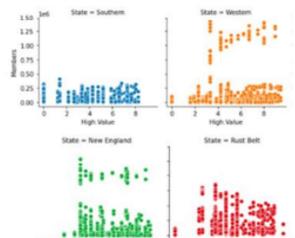
Decline

Dante Kanter

Introduction

The general consensus amongst labor historians is that the election of Ronald Reagan led to a marked decline in union density in the United States. The decline has continued steadily up until the present day. Beginning with the Air Traffic controller strike in 1981, where the Reagan administration fired and permanently replaced striking union controllers, and continuing with the membership decline of the AFL-CIO's largest affiliate, the National Labor Relations Board, a legal and political climate hostile to union organizing emerged in the U.S. In my research, my hope was to take popular and academic data sources, by doing a comparative analysis and analysis of membership data by region, highlight particularities that offer a more complex view of the decline of American Labor.

changes in union membership and changes in the mean minimum wage throughout these regions, in order to highlight what the private sector had to gain by disempowering union networks.



Materials

For this project, I used Python as my base language, with Seaborn and Pandas as my two libraries. Seaborn is a language used to visualize datasets, and Pandas is a language used to manipulate datasets.

I used two datasets for this project— one a survey of the

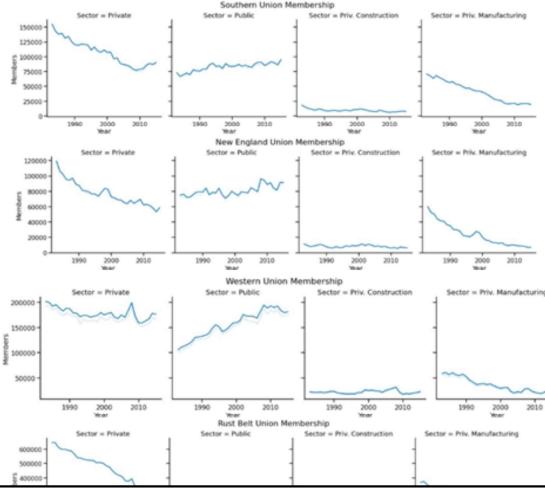
I used two datasets for this project— one a survey of the minimum wage, by state, from 1968 to 2017. Several wages were included each year—the low estimate of minimum wage in that state and the high estimate of minimum wage. The dataset also included wages adjusted to match a

Methodology

I began by separating out the dataset by country, quartering the country into Southern, Western, New England, and Rust Belt quarters. I plotted the sum of memberships in each collection of states along a line graph, separating the "col" segment by the type of industry in which the union operated. Then I compared the differences between industries in the public and private spheres.

I performed much the same method on the dataset pertaining to minimum wage. I then aggregated the two datasets and plotted out a scatter graph meant to show the relationship between union membership and minimum

relationship between union membership and minimum wage.



Results

All regions of the country are marked by a steep decline in the minimum wage across the country, although recovery looks very uneven. The West and the Northeast having the steepest declines and the rust belt looking like the preface of a second decline. The south, with low union membership, experienced a step-ladder decline, while the Industrial Rust belt took a nose-dive. The western states, especially California, were the few to spike after the 2008 recession. New England saw the benefits of the NAFTA and the Clinton administration. Public Union membership has increased everywhere except the Rust Belt. The greatest correlation between minimum wage and union membership appeared to be in the Western States and New England.

Conclusion

The scatter graph is telling, as those regions that include the wealthiest states with the highest union membership—California and New York—have “boasters” with high correlation between high minimum wage and high membership. The Midwest does not have a particularly strong history of labor unions, but it is in a zone of low wages and union membership, while in the Rust Belt, people appear to be earning less, but existing on the same middle plane of membership and wages.

had an influx of new unions as established organizations, such as United Steelworkers, began to ebb out of the region. This explains the halting decline in the early years, that later gives way to a steady decline.

high wages is difficult to miss, however, and the sharp drop in the minimum wage just as unions began to be disenfranchised speaks to how this process benefited private industries, who felt justified in paying their workers a lower wage without a union to protect them.

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