

## **Keynote: The Visual Turn in DH**

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Digital Humanities and the Visual World Symposium (<https://digitalfrontrange.wordpress.com/>)

October 12, 2019

A special thank you to Vilja Hulden for the invitation and all of her work to organize this symposium!

Note: Please pardon any typos or grammatical issues. The slides include videos, which are not visible in the PDF.

## **The Visual Turn in DH**

How can we use computational methods to study visual culture? How can we use visual culture to communicate DH scholarship? In this talk I will offer a brief genealogy of visual digital humanities, demonstrate how computer vision is opening up large scale image analysis, and explore how data visualization is shaping how we know what we know in DH. Examples are drawn from work on 20th and 21st century United States visual culture currently being conducted by the Distant Viewing Lab

### **# Intro**

Today I want to offer an observation and a provocation. We are seeing a visual turn in DH.

And I'm going to situate this turn in what JMJ terms "DHDH...the digital humanities in its most structural form as articulated by global academic institutions" (4DH + 1 Black Code, American Quarterly, 2018). This includes publications, conferences, grants, and awards. In other words, the structures that create, shape, and define scholarly fields.

So what do I mean by a visual turn in DH?

I always find it helpful to begin by defining my terms.

### **## Visual**

- verb: of, or relating to, or used in sight

- noun: something such as a picture, image, photograph, art, and visualizations

### **## DH**

I'm not interested into getting into a debate over the definition of DH. There is plenty of work on this topic. But I do find it helpful to understand the configuration of the field that one is drawing from. For me, I draw on Kathleen Fitzpatrick's definition stated in DDH 2012:

"a nexus of fields within which scholars use computing technologies to investigate the kinds of questions that are traditional\* to the humanities, or...ask traditional\* kinds of humanities-oriented questions about computing technologies"(Kathleen Fitzpatrick, "The Humanities, Done Digitally." Debates in the Digital Humanities 2012).

I always include an asterisk because I think the idea is to also ask new questions and expand avenues of inquiry. I'm not trying to oversell DH. Rather, I think this is a possibility every time we expand our methodological approaches. (Hence my love and belief in interdisciplinary!)

### **## Visual Turn in DH**

So what does a visual turn mean?

Object of Study: visuals/ visual culture as an object of study. (Not just text!)

Technology: The emergence of a new set of computational methods, namely computational image analysis and computer vision, that have opened up large scale analysis of visual culture in ways that we could only theorize previously.

Scholarly Arguments and Communication: A shift in understanding that visuals, multimedia and visualizations for example, are ways of knowing that can convey scholarly arguments and serve an exciting form of scholarly communication.

Reflexive: And this is where the reflexive part of Fitzpatrick's definition is important. We also are bringing asking humanities questions of computing technologies, particularly computer vision.

What conditions have necessitated and made possible a visual turn in DHDH?

I want to offer a quick (and definitely not complete!) take on how. It's an entangled story of:

- how structures were created in order to create the field of study that would become known as DH
- shifts in technology
- the impact of existing disciplines

# Text Everywhere

One reason is because of DHDH has centered text. While this story is being increasingly challenged, the dominant story of DH centers three fields as the foundation of DH. They are Classics, Linguistics, and Literature.

The origin story goes like this:

In the late 1940s, a Jesuit priest named Father Roberto Busa wanted to create a comprehensive concordances of St. Thomas Aquinas works. He turned to computers and worked with IBM and a team of women computers to create punch cards to create what would be called the Index Thomisticus throughout the 1950s. Work included creating computer software for tasks such as lemmatization. The importance of this is cemented in the name of the lifetime achievement award (ADHO: "for the application of information and communications technologies to humanities research") given by the Association of Digital Humanities Organization. It is called the Roberto Busa Award.

With the emergence of computers that could process text and numbers (in other words "strings") came work on quantitative approaches to areas such as authorship and style (ex. Shakespeare, Bible) shaped by the disciplines of literature and linguistics.

This emerging field came to be known as "Humanities Computing" by the 1970s. In order to cement this new formation, organizations like the Association for Computing in the Humanities founded in 1978.

With computational linguistics going its own way in the late 1980s and Digital History forming its own structures in the 1990s, Humanities Computing became primarily the domain of literature scholars.

Two areas emerged:

(1) TEI and XML: One was making texts machine readable for computational analysis. The late 1980s saw the establishment of the Text Encoding Initiative (TEI) with the first set of guidelines published in 1994. TEI and XML was used for tasks such as access, annotation, and search.

(2) Digital editions: Harnessing the possibilities of the digital to produce scholarly editions, often focused around the canon. This was particularly animated by the expansion of the internet throughout the 1990s.

Another shift in technology firmly situated DH in Literature and text, the development of digitization. Along with focusing on the canon, this replicated the priorities of libraries and archives, namely books and paper manuscripts.

In fact, the impact of digitization (as a method and product) of the field was so prevalent that it is one of the reasons attributed to the field's name change. In their edited volume *A Companion to the Digital Humanities* (2004), John Unsworth, Susan Schreibman, and Ray Siemens put in motion a name change through the title of their book. As Kathleen Fitzpatrick writes, one impetus was so that the field wasn't defined as the field of digitization (<https://www.chronicle.com/article/The-Humanities-Done-Digitally/127382/>). (All come from English/literature backgrounds.)

As millions of books were digitized, scholars worked to create machine readable text, which were further enabled by advances in OCR. With lots of data and increased computational power of personal computers, text mining took off as the field borrowed from computational linguistics and statistics and lead to areas such as distant reading, macroanalysis, and stylometry. Words.... words everywhere!

## ## Conferences and Publications

So how institutionalized is this in DHDH structures?

Let's look at conferences and publications in the last decade.

If we look at the DH conference for example:

- Scott Weingart has analyzed the international DH conference and looked at 2013-2017. His research has shown the constant dominance of text analysis with it actually growing year by year.

(In his 2015, he noted the steady increase in submissions tagged with the category "visualization". He wrote, "even if we're not branching outside of text as much as we ought, the fact that visualizations are increasingly important means DHers are willing to move beyond text as a medium for transmission, if not yet as a medium of analysis." (<https://scottbot.net/submissions-to-digital-humanities-2015-pt-2/>).

In his 2017 analysis, he made two more interesting observations:

- By topic: "Text is still the bread and butter of DH, but we see more non-textual methods being used than ever" (<http://scottbot.net/submissions-to-dh2017-pt-1/>).

- By discipline: "'Film and Media Studies' is way up compared to previous years, as are other non-textual disciplines, which refreshingly shows (I hope) the rise of non-textual sources in DH" (<http://scottbot.net/submissions-to-dh2017-pt-1/>).

Now let's take a look at DH publications:

This study looked at 1987 to 2014 across 6 journals. We see literature and text dominating the 1990s and 2000s.

I want to note that an important change happened in 2011 and signaled shifts in the field. One of the flagship journal of DH, Literary and Linguistic Computing (LLC), renamed themselves to Digital Scholarship in the Humanities. DSH is now with DHQ, which was founded in 2007, have become the main journals of the field with funding and support from ADHO.

Yet, despite their names, the flagship journals still indicate that the field is a land of text. Just look at how they are designed! I tried to find a piece of multimedia in DSH to no avail.

The prevalence of text is so naturalized that when DH scholars talk about data... they usually mean text. Whether plain text for text mining or a spreadsheet / database with numbers and words (images turned into text descriptions, music defined by song lyrics, or descriptive metadata), when we say data... we mean text.

DHDH is a land of text. (I mean...I love text. I even wrote this talk out! It's a great way to communicate and make arguments.)

### # Visual Turn

But DHDH is changing! And this is exciting because scholars from fields like archeology, media studies and the digital public humanities have been fellow travelers and shaping the field for decades and my observation is that finally they are becoming more visible within the major structures of DH.

Let's look again at publications.

If we take a look at several essays that have come out in DSH over the last several years and books, we can see the turn happening.

Let's look at recent grants and awards.

Visual Culture Studies - Photogrammar (NEH and ACLS) and Yale DH Lab  
Digital Public Humanities - American Panorama/ Renewing Inequality - Mellon and AHA  
Rozensweig Award 2019  
Media Studies and Cultural History - Vogue  
Film and Media Studies - Media Ecology Projects SAT (NEH)

Media Studies - Image Plot (Lev Manovich and the CUNY Software Studies Initiative)  
Media Studies/ Games Studies - Tiltfactor (lots of grants!)  
History - Virtual Angkor - AHA Rozensweig Award 2018  
Art History - Victoria's Lost Pavilion

Importantly, these projects don't lend themselves to our publishing structures for they come in multimodal forms as well such as interactive, digital projects and software and aren't meant to be "read" but scrolled, clicked, touched, and navigated on screens and through headsets.

Stanford UP is on the cutting edge of this with their new digital project publication model.

So I want to come back to the three characteristics of the visual turn that I mentioned at the beginning. The projects that I show here are indicative of these traits.

1. They center visuals as an object of study.
2. They are using visuals as a form of their scholarly arguments and communication.
3. They are using emerging technologies like the latest web frameworks, gaming frameworks, AR, and 3D.

## # Computer Vision

Now I want to zoom in on a technology that I think has just begun to transform our field and that is computer vision.

Computer vision, particularly the power of neural networks, has opened up large scale analysis of visual culture in ways that we could only theorize 10 years ago. This is possible in part also to the increased computational power of computers including their storage capacity, memory capacity, and GPUs. In other words, distant reading (or we like to say distant viewing!) of images is possible in ways that were not 10 years ago. And this is opening up image analysis for humanistic inquiry.

And I want to turn to examples from our Distant Viewing Lab to show some of the possibility's computer vision offers for a visual turn in DH.

## ## DV Lab

We use and develop computational techniques to analyze visual culture on a large scale. I run the lab with my colleague Taylor Arnold in the Department of Math and Computer Science. We bring out different trainings to bare on three questions:

How can we use and develop computational methods to pose and answer questions in visual culture studies?

How can we use visual culture to communicate DH scholarship?

How can we bring humanities questions to bare on computational visual methods?

We take visual culture as our object of study, explore new methods for large scale analysis of visual culture using computer vision, and use visualizations to convey humanistic knowledge while asking critical questions of computational image analysis approaches.

Let me show several examples of how:

## # FSA

During the Great Depression and World War II, the US federal government undertook one of the most ambitious documentary photography projects of the 20<sup>th</sup> century. Photographers like Dorothea Lange and their images like "Migrant Mother" are iconic. Interested in exploring the collection at scale, we turned to the digital, public humanities.

We used summary statistics communicated through visualizations to learn characteristics of the collection.

We now are interested in how image analysis can open up new information about the archive.

- a. Using computer vision, we have been exploring aesthetics and content in the images. In other words, looking for patterns about who and what is being represented and how. Here we see an example.
- b. We then have been looking at these characteristics by photographer. We see, for example, that the photographers work clusters according to: (1) photographs in urban settings, (2) photographs of the war effort, and (3) photos in rural areas and small towns. Evans and Shahn's photos are alike, as well, which is super interested given that Evans trained Shahn.
- c. We are then using these patterns for a recommender system in the new Photogrammar. Along with seeing visual patterns, the goal is to keep remixing the collection in new ways.

[For more, see our article “Distant Viewing” in Digital Scholarship in the Humanities. An open access version is available on [distantviewing.org](http://distantviewing.org)]

## # Bewitched

Using computer vision, we have been exploring content and style in the images. For example, looking for patterns about who and what is being represented (ex. People and objects) and how (ex. formal elements). Here we see an example.

“Across every metric analyzed, Samantha is distinctively positioned as the leading character on *Bewitched*. Jeannie, however, is consistently shown to be visually and narratively dominated by Tony. The differing nature of Samantha and Jennie within their respective series challenge existing feminist and queer readings that often equate the two sit-coms with one another.<sup>10</sup> Our analysis provides a path for understanding suburban feminism in 1960s America through two differing perspectives (Arnold, Berke, and Tilton. “Visual Style in Two Sit-Coms” in the *Journal of Cultural Analytics*. Online and open access: <https://culturalanalytics.org/2019/07/visual-style-in-two-network-era-sitcoms/>).

## # Friends

We’ve also been having some fun distant viewing Friends as we explore post-war sit-coms.

Here we can then look at image similarity as scale. We used results from our Distant Viewing Toolkit and used a visualizer under development by our colleagues at Yale’s DH Lab to explore. What do we see?

Death...marriage...chatting in a living room... conversations over coffee...it’s a family sit-com! And we think this is one reason our students love this show!

## # What is DV?

- method and theory for analyzing images at large scale
- make explicit the interpretive nature of extracting semantic metadata from images
- must "view" visual materials in order to study at scale
  - assign a semantic meaning to an array of pixels construct a representation of elements contained within visual material: a code system in semiotics, or, similarly, a metadata schema in informatics
  - design and apply algorithms/models capable of converting raw images into the established representation
- use exploratory data analysis to aggregate and visualize the automatic extraction of semantic elements

## # DV Toolkit

The Distant Viewing Toolkit is a Python package for the computational analysis of visual culture. It addresses the challenges of working with moving images through the automated extraction and visualization of metadata summarizing the content (e.g., people/actors, dialogue, scenes, objects) and style (e.g., shot angle, shot length, lighting, framing, sound) of time-based media. This toolkit is optimized for two purposes: (1) scholarly inquiry of visual culture from the humanities and social sciences, and (2) search and discovery of collections within libraries, archives, and museums.

Video of toolkit. (For more info, see [distantviewing.org](http://distantviewing.org) and navigate to our GitHub page. The first version of the toolkit is available. Feedback welcomed!)

## # Access and Moving Image Heritage

We love applying this to popular culture but also see distant viewing as having exciting possibilities across many areas of visual culture. Viewing at scale to understand auteurs, film genres, and documentary are just a few examples.

One that particularly excites us is the possibility for archives and libraries. There are millions of hours of moving images without finding aids or descriptions. We are working with groups like the Media Ecology Project and AAPB to explore ways to create metadata that could open up these collections.

## # The Visual Turn

We are excited to be a part of the visual turn:

- Object of Study: visuals/ visual culture as an object of study. (Not just text!)
- Technology: The emergence of a new set of computational methods, namely computational image analysis and computer vision, that have opened up large scale analysis of visual culture in ways that we could only theorize previously.
- Scholarly Arguments and Communication: A shift in understanding that visuals, multimedia and visualizations for example, are ways of knowing that can convey scholarly arguments and serve an exciting form of scholarly communication.
- Reflexive: And this is where the reflexive part of Fitzpatrick's definition is important. We also are bringing asking humanities questions of computing technologies, particularly computer vision.

## # Challenges for the Visual Turn in DH

Access: Accessing image data is difficult (ex. Copyright and digitization) and processing it is expensive.

Labor: That we are going to need to rethink labor. At the DV lab, this work is possible because of the expertise of my colleague in Math and CS. The intellectual labor that makes our work possible is not mine alone. I'm worried that as we make a visual turn that we might replicate the idea that there is a singular brilliant mind who can be an expert in a humanities field, an expert in a field like stats or computer science, and an expert programmer. I think we need to listen to feminist labor models (ex. Losh and Wernimont's Bodies of Information) and debate in the DH about labor (Gold and Klein's Debates in the DH Series).

Credit: And this is connected to credit. At this point, I almost always co-author and we need to keep pushing for different scholarship models and give credit to forms of scholarship that look different (ex. Digital online platforms, software). Giving credit to different forms of scholarship and scholarly communications is absolutely necessary for a visual turn.

Ethics: Along with ethics being about credit and labor, we have to bring critical questions to a visual turn. Computer vision in particular is full of problematic assumptions and we risk replicating them. But DH is particularly positioned to ask questions of these technologies and to reimagine them in new ways.

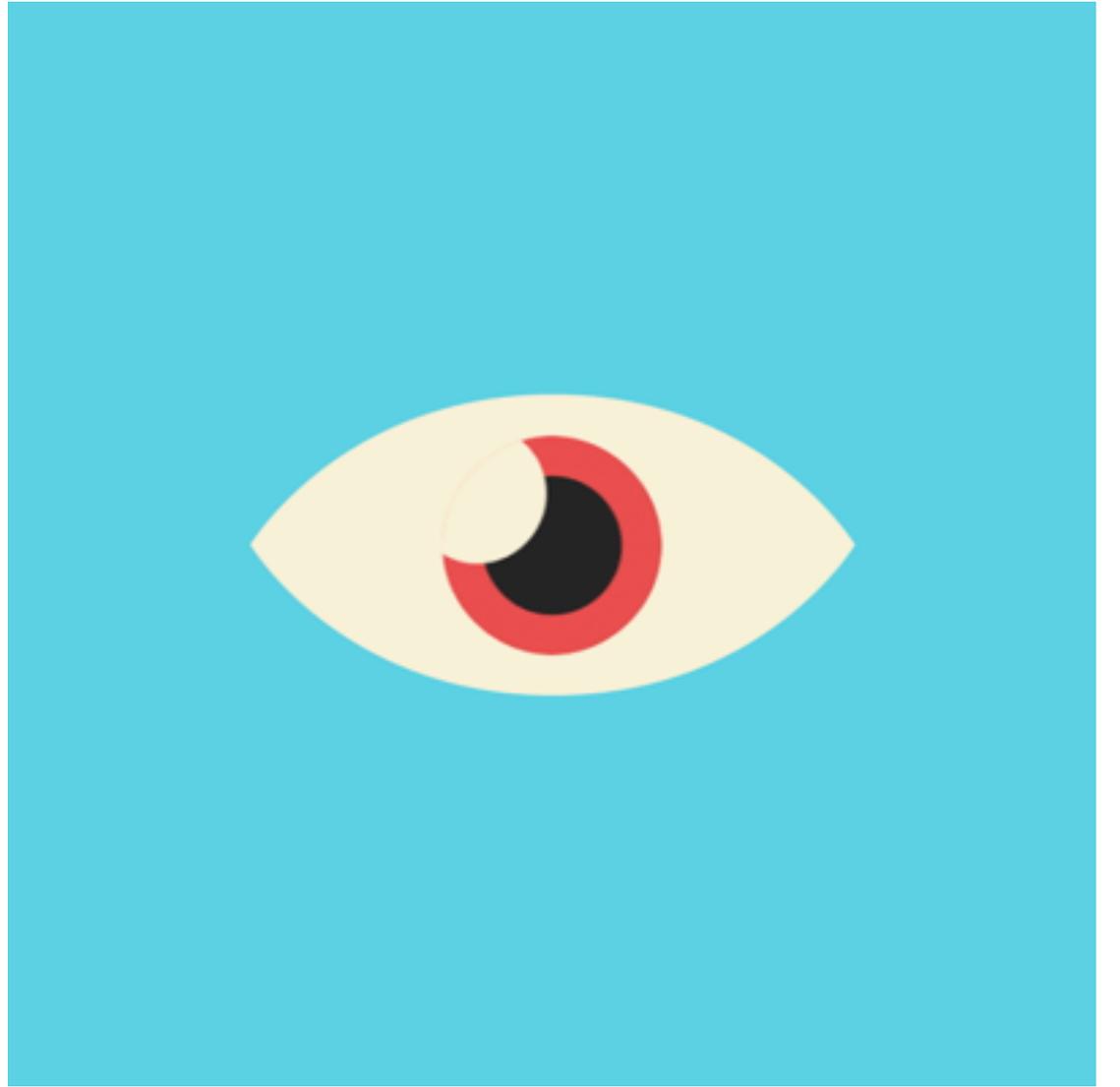
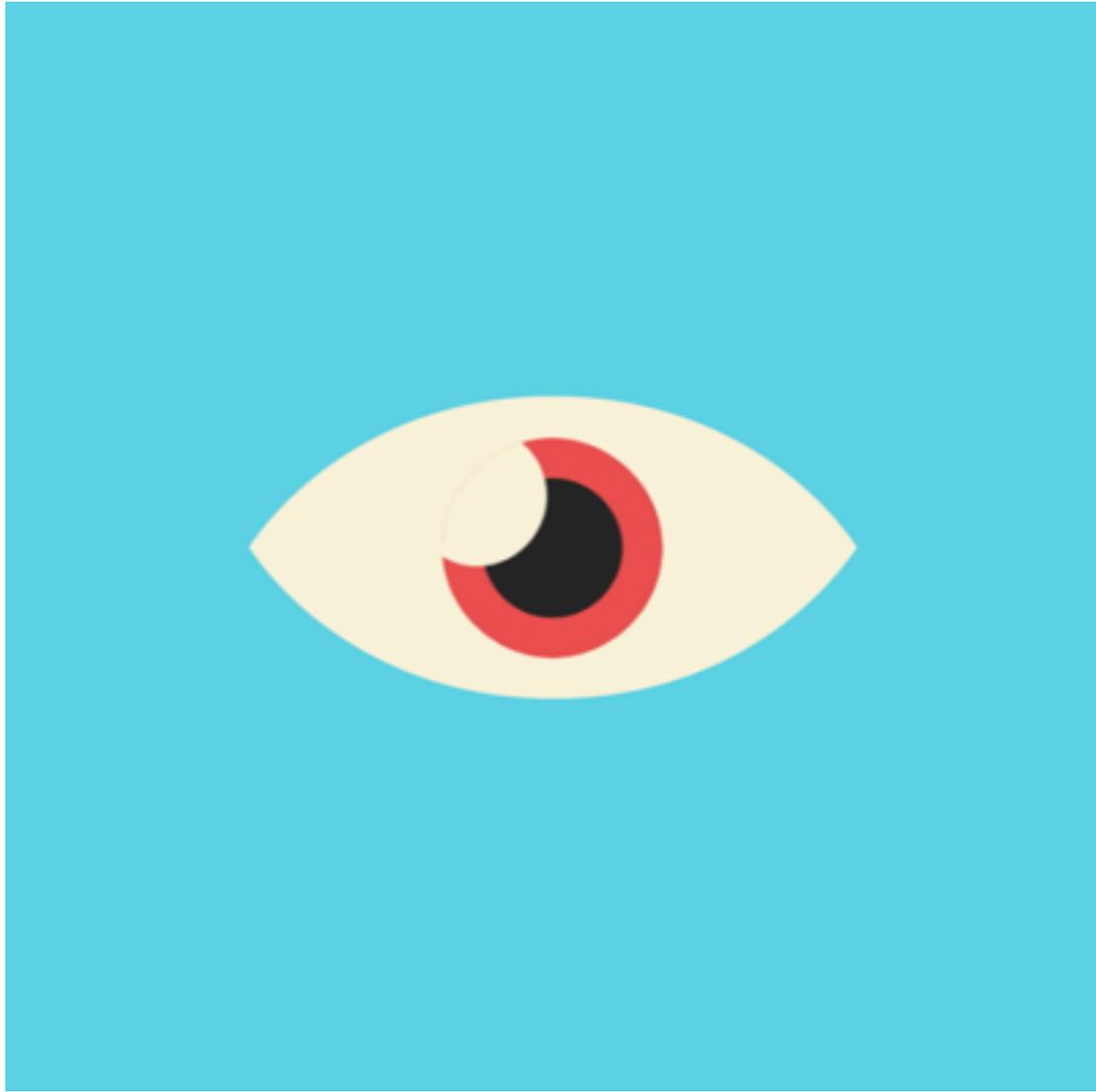
# Visual Turn in DH

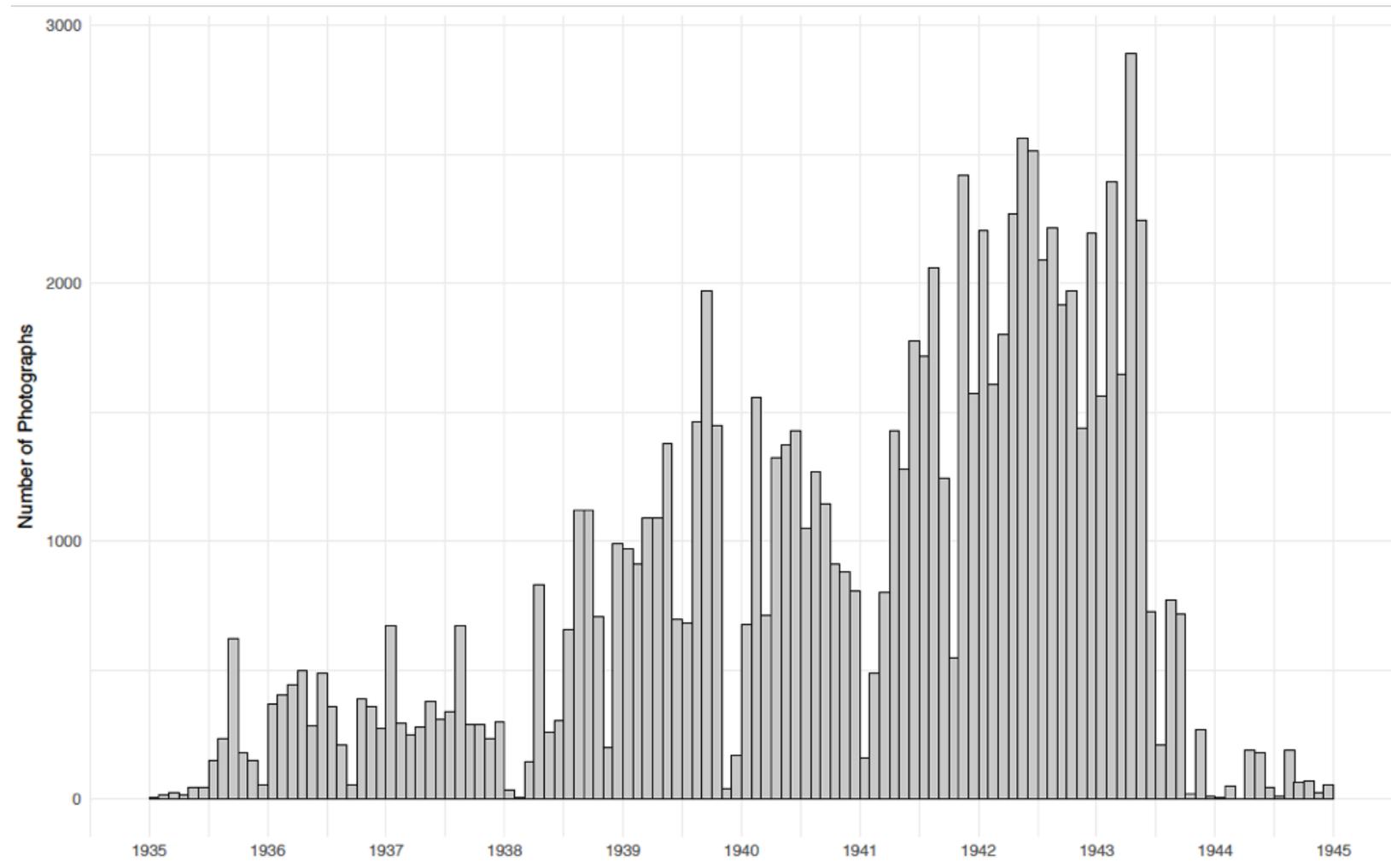
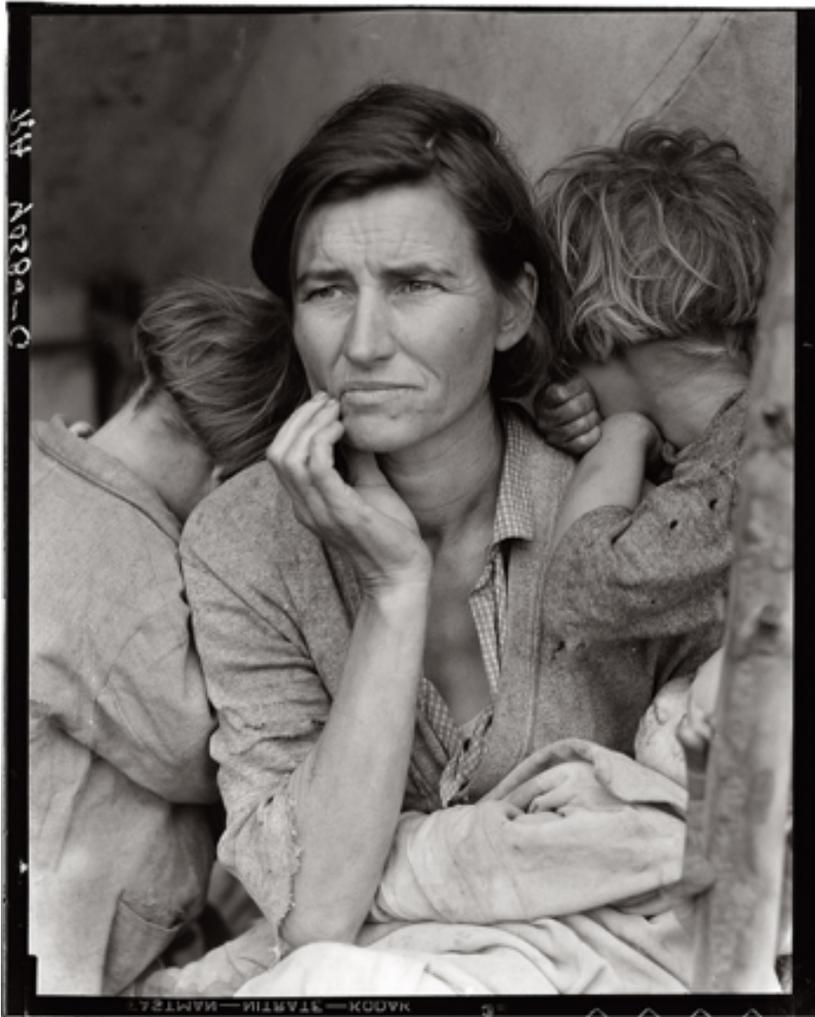
Lauren Tilton | @nolauren

Distant Viewing Lab  
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University of Richmond



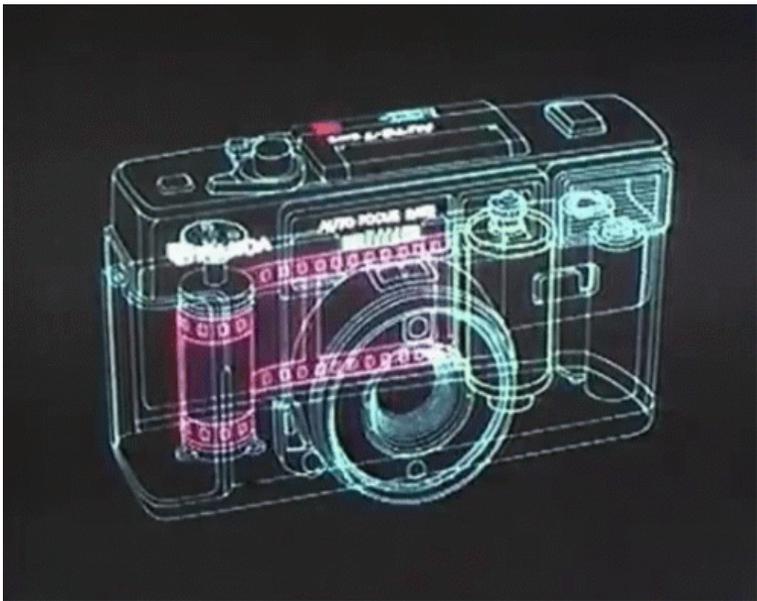
“ DHDH...the digital humanities in its most structural form as articulated by global academic institutions  
— Jessica Marie Johnson,  
“4DH + 1 Black Code”,  
American Quarterly. 2018.

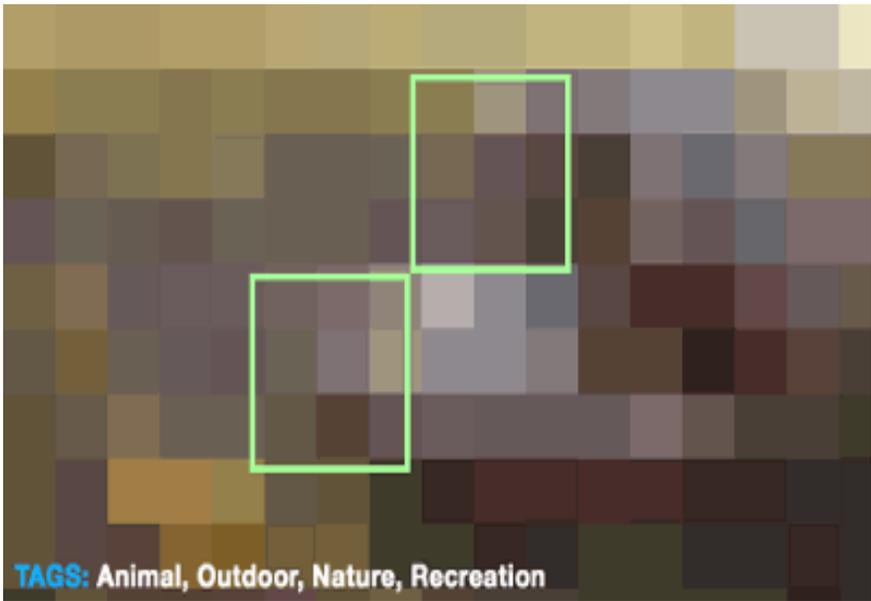
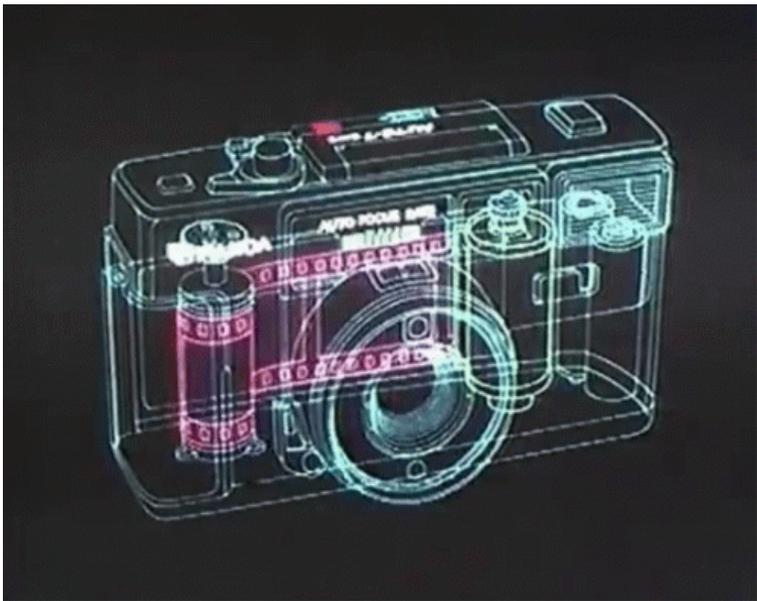
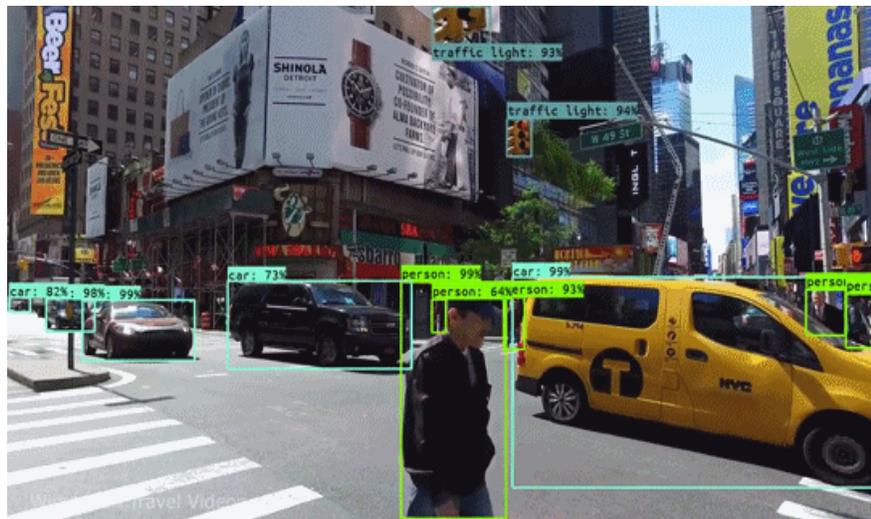


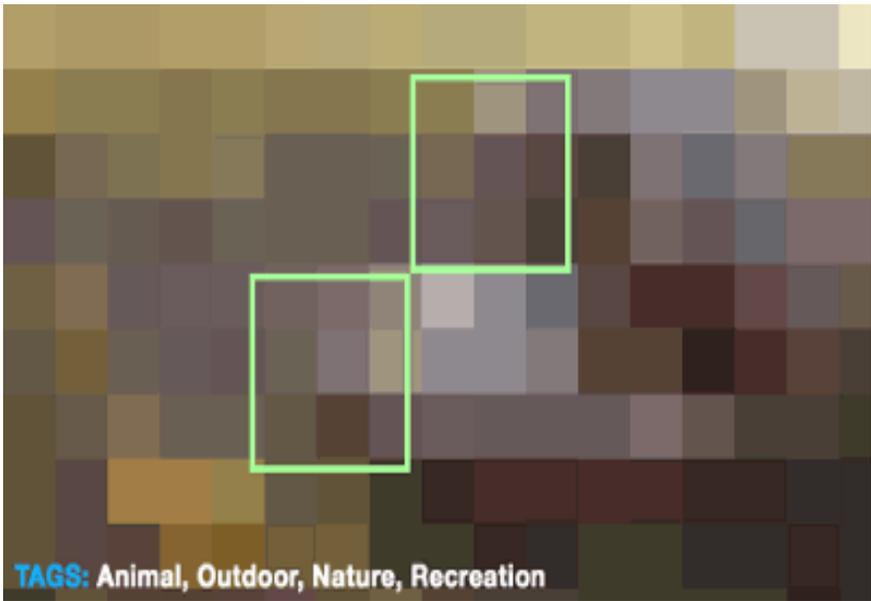
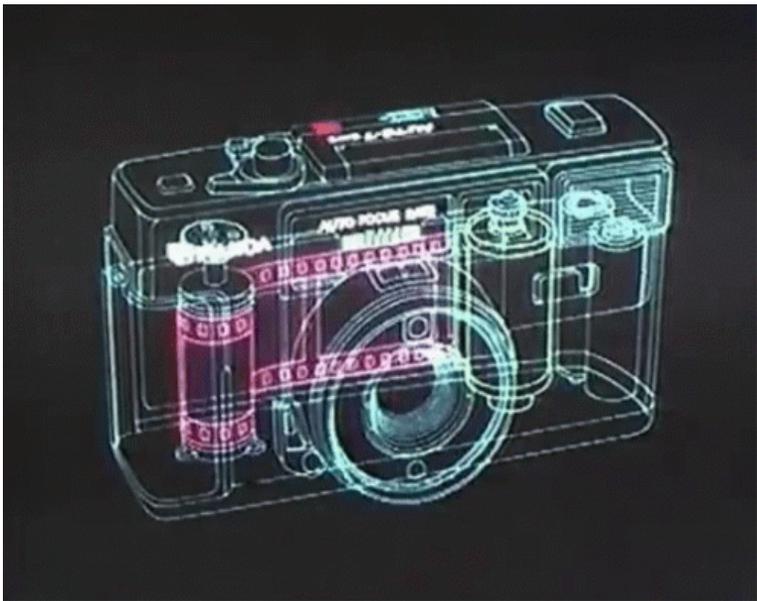
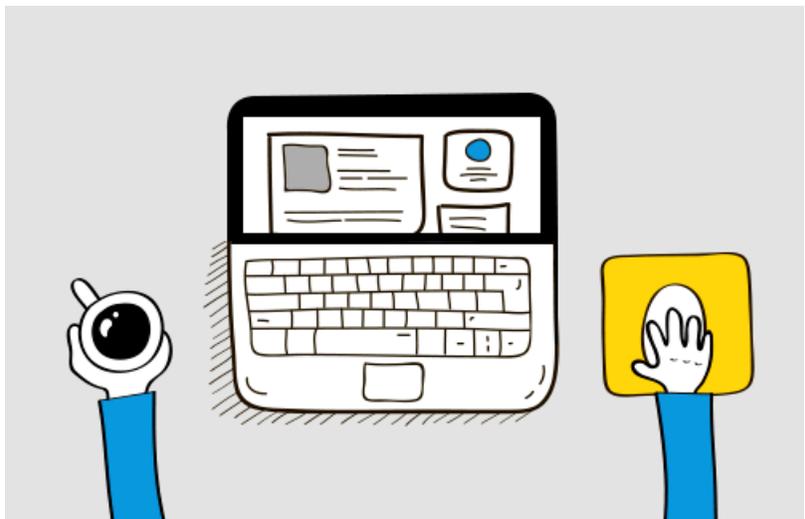
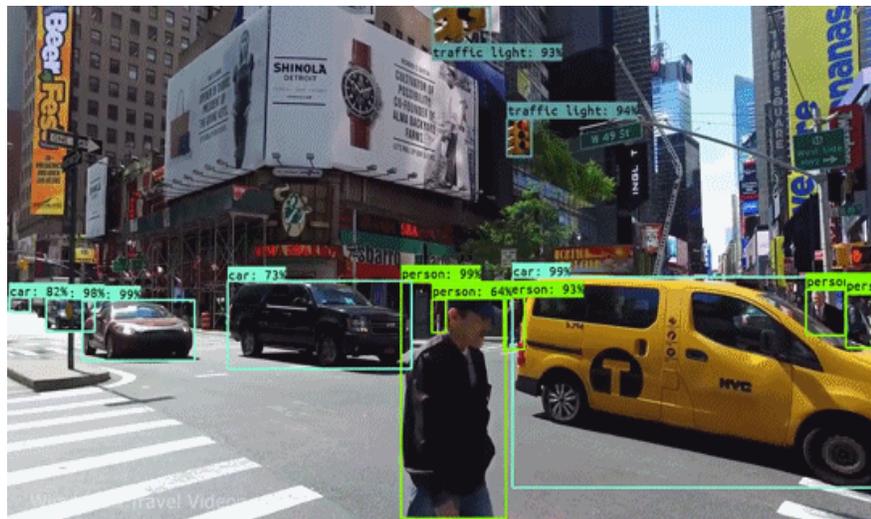


“...a nexus of fields within which scholars use computing technologies to investigate the kinds of questions that are traditional\* to the humanities, or...ask traditional\* kinds of humanities oriented questions about computing technologies.”

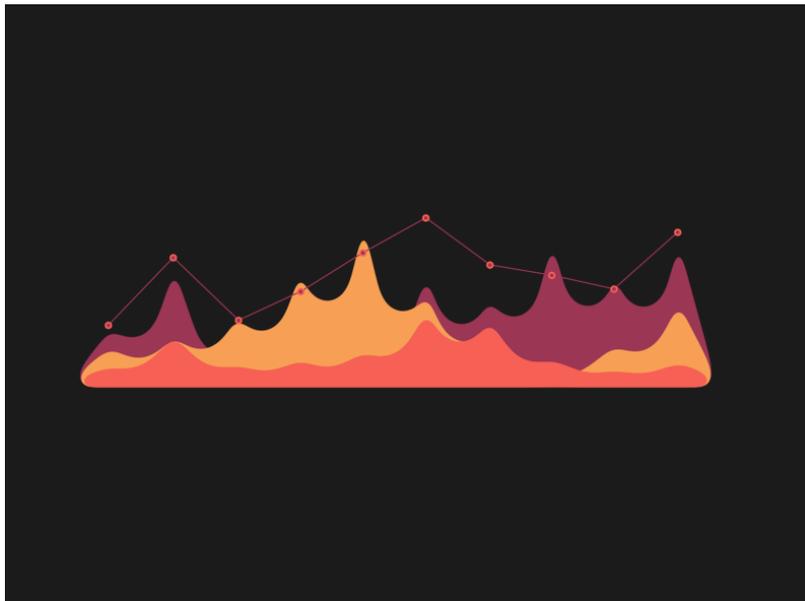
- Kathleen Fitzpatrick  
“The Humanities, Done Digitally.”  
Debates in the Digital Humanities  
2012







**TAGS:** Animal, Outdoor, Nature, Recreation



# 1. Why a turn?

Text. Text (almost) Everywhere.

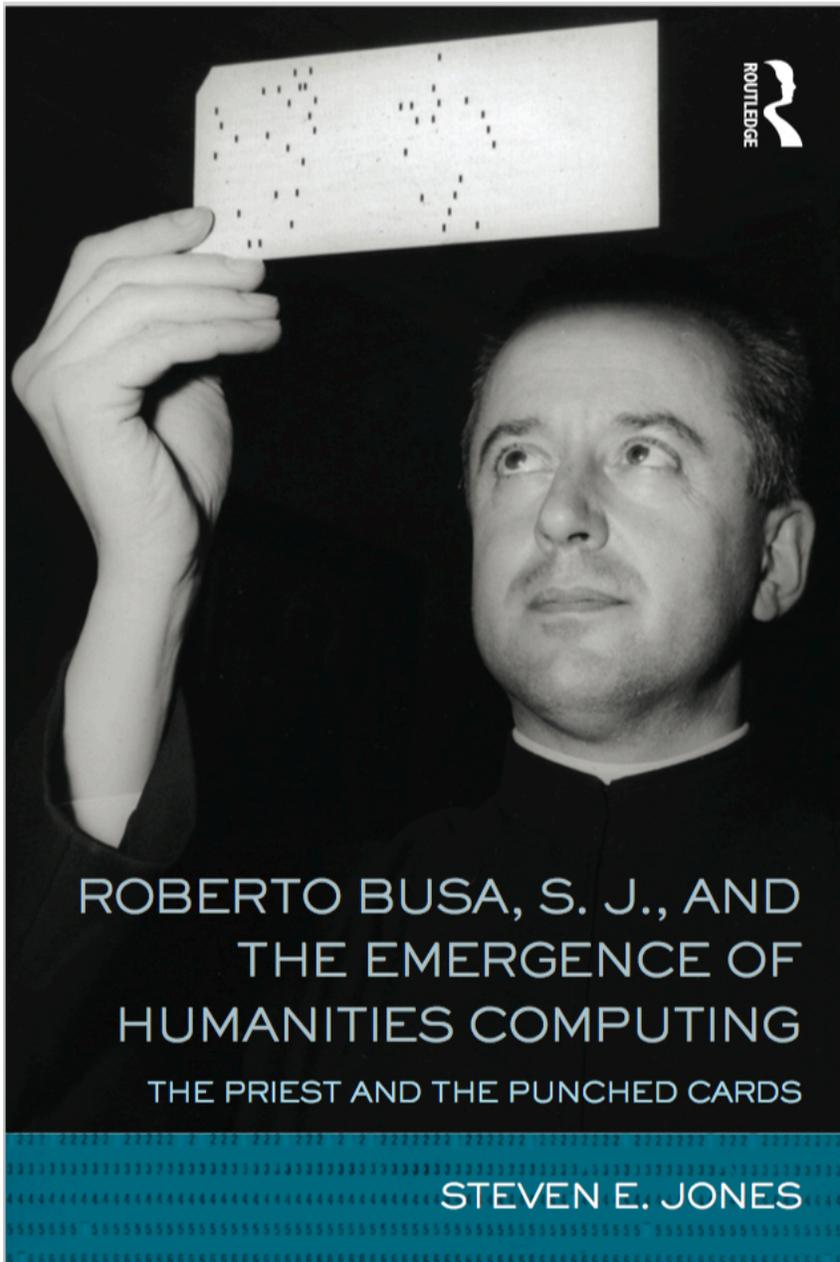


Gisa Crosta punching card for the *Index Thomisticus*.

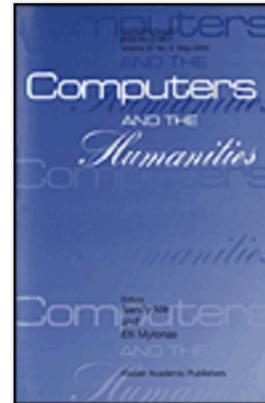


Photo from CIRCSE Research Centre, Università Cattolica del Sacro Cuore, Milan, Italy. CC-BY-NC

Courtesy: Melissa Terra's Blog: <http://melissaterras.blogspot.com/2013/10/for-ada-lovelace-day-father-busas.html>



## Computers and the Humanities



Coverage: 1966-2004 (Vol. 1, No. 1 - Vol. 38, No. 4)

Published by: [Springer](#)

**Title History** ([What is a title history?](#))

2005-2015 -

[Language Resources and Evaluation](#)

1966-2004 -

**Computers and the Humanities**

# Frankenstein Volume I Draft in Chapter Sequence

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State : draft

Hand(s) : Mary Shelley, Percy Shelley

Date Written : [August or September]-[?December] 1816

Institution : Bodleian Library, University of Oxford

Shelfmark : MS. Abinger c. 56

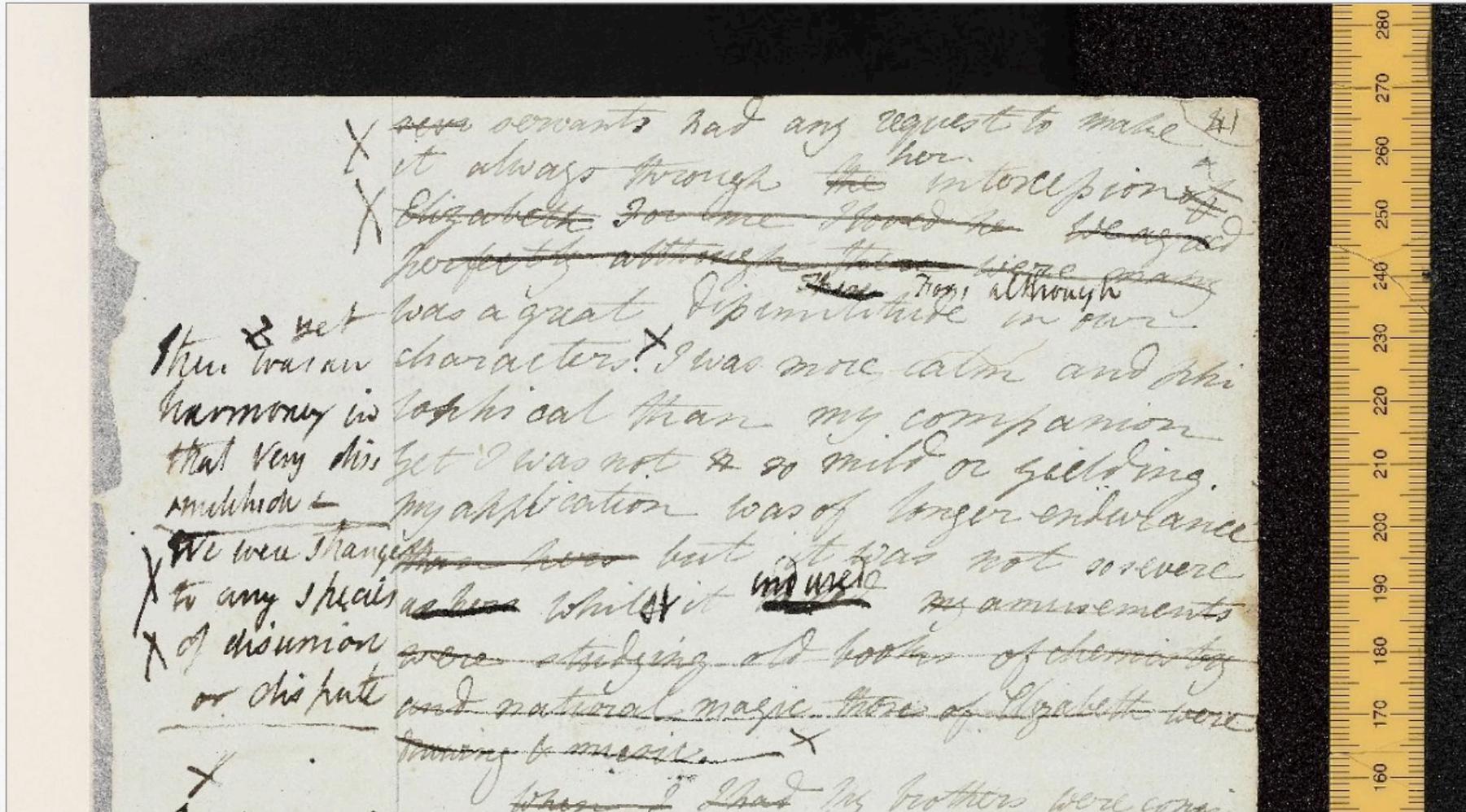
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Transcription Status: ● ● ●

Metadata Status: ● ● ●

Title/Literary Work : Frankenstein

Q Q Q ↻ C Search  LIMIT VIEW:  All  Mary Shelley  Percy Shelley





("Agamemnon", "Hom. Od. 9.1", "denarius")  
All Search Options [view abbreviations]

Browse the Collections

[Greek and Roman Materials](#)  
Primary and secondary sources for the study of ancient Greece and Rome

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Look through a massive library of art objects, sites, and buildings. The library's catalogs document 1305 coins, 1909 vases, 2003 sculptures, 179 sites, 140 gems, and 424 buildings. Each catalog entry has a description of the object and its context; most have images. Descriptions and images have been produced in collaboration with many museums, institutions, and scholars. Catalog information and keywords have been taken from standard sources, which are cited in the entries for each object.

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Arabic language documents

[Germanic Materials](#)

Materials for the study of the Germanic Peoples

[19th-Century American](#)

Sources on the history of the 19th-century United States.

[Renaissance Materials](#)

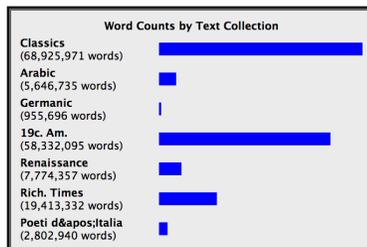
Primary and secondary sources in early modern English literature

[Richmond Times Dispatch](#)

Issues of the Richmond Times Dispatch.

[Humanist and Renaissance Italian Poetry in Latin](#)

Latin poems produced in Italy or in Italian cultural environments during the period starting from around the birth of Dante until the first half of the sixteenth century.



[View a map](#) of the most frequently mentioned places in the Perseus Digital Library.  
Or by collection:

- [Greek and Roman Materials](#)
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- [Richmond Times Dispatch](#)

The Women Writers Project is a long-term research project devoted to early modern women's writing and electronic text encoding. Our goal is to bring texts by pre-Victorian women writers out of the archive and make them accessible to a wide audience of teachers, students, scholars, and the general reader. We support research on women's writing, text encoding, and the role of electronic texts in teaching and scholarship.

Women Writers in Review

WOMEN AS WRITERS AND READERS

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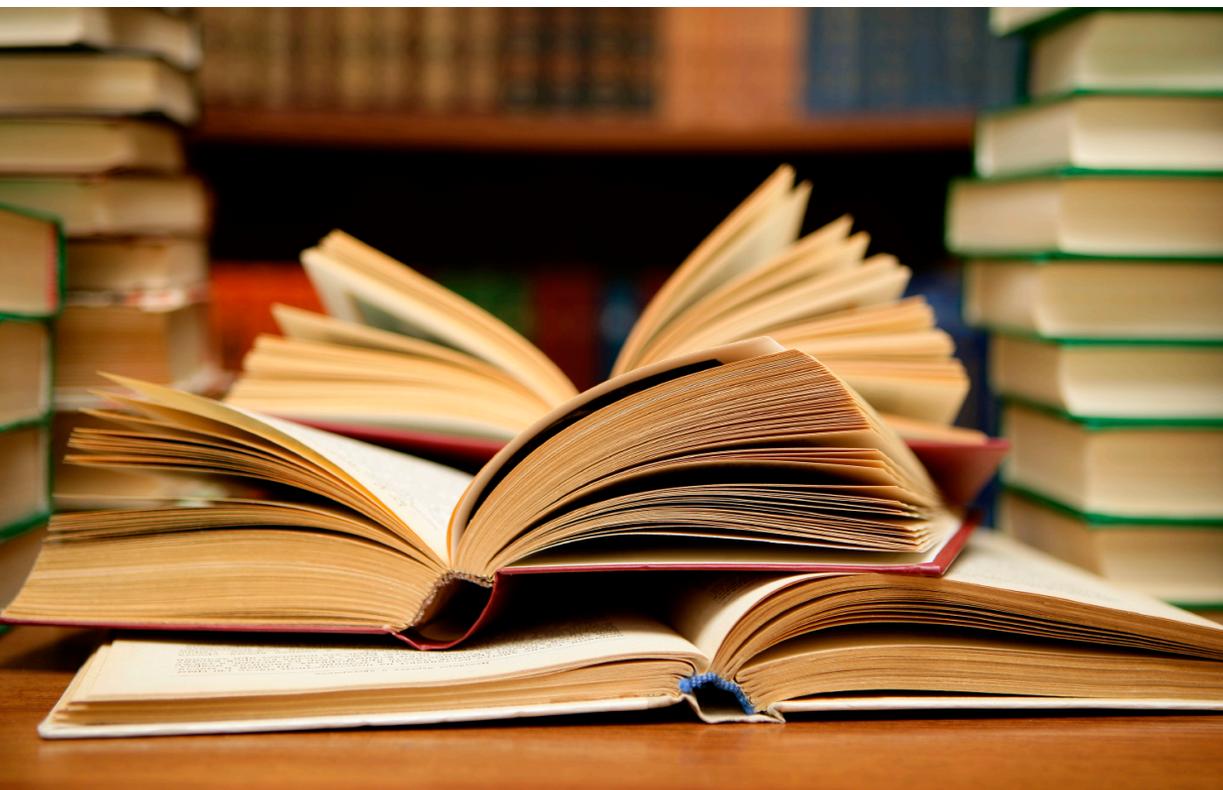
34 RELATED REVIEWS

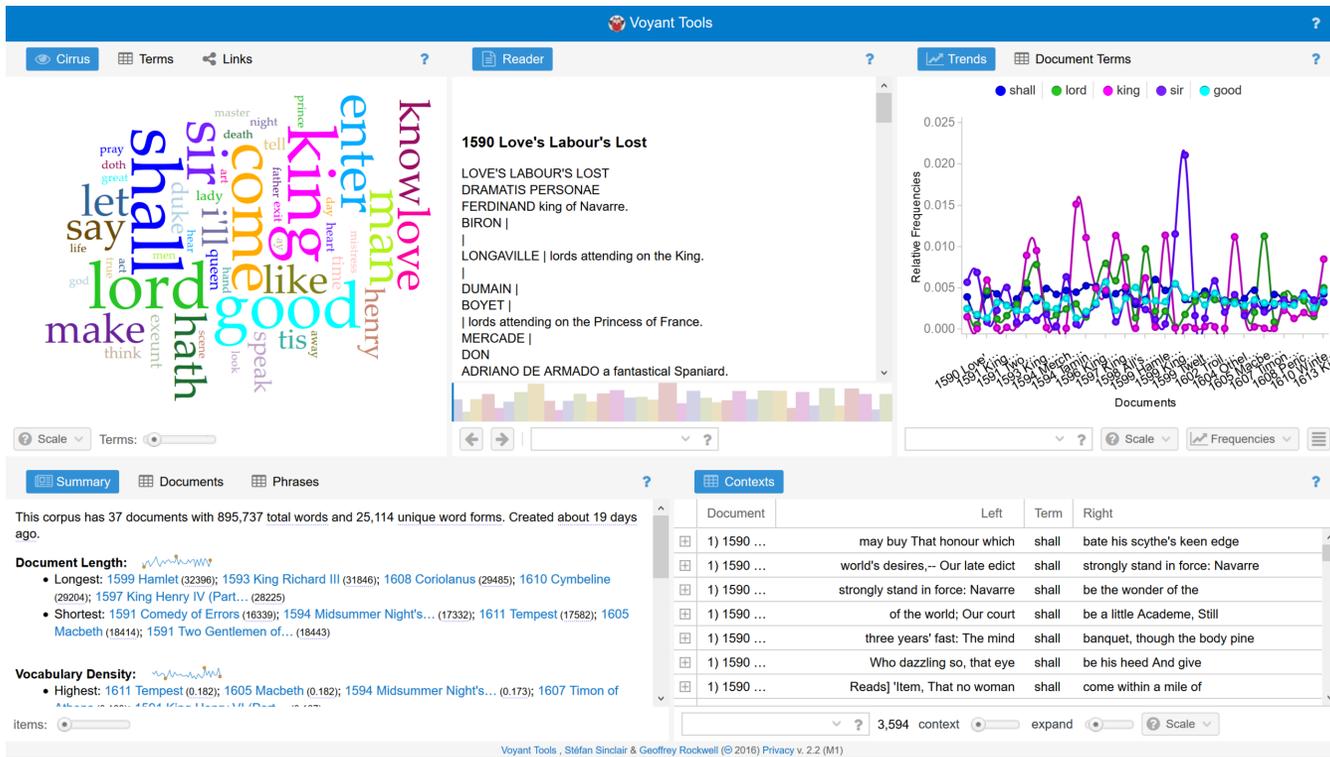
1790: The Edinburgh Magazine, or Literary Miscellany on Smith's Ethelinda, or the Recluse of the Lake

1790: The Monthly Review on Smith's Ethelinda, or the Recluse of the Lake

<p>Source</p> <p>Unknown. "Mr. V. Ethelinda, or, the Recluse of the Lake. By Charlotte Smith. 12mo. 5 Vols. 15s. second. Cadell, 1789." <i>The Monthly Review; or Literary Journal</i>. Volume no 2. pp. 161-65. London, England: 1790.</p> <p>Works</p> <p><i>Ethelinda, or the Recluse of the Lake</i></p> <p>Authors</p> <p>Smith, Charlotte (Turner)</p>	<p>Tags</p> <p>Theme: women as writers and readers</p> <p>Genre: literary review</p> <p>Format: article or essay</p> <p>Reception: very positive</p>
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Women Writers in Review is here!





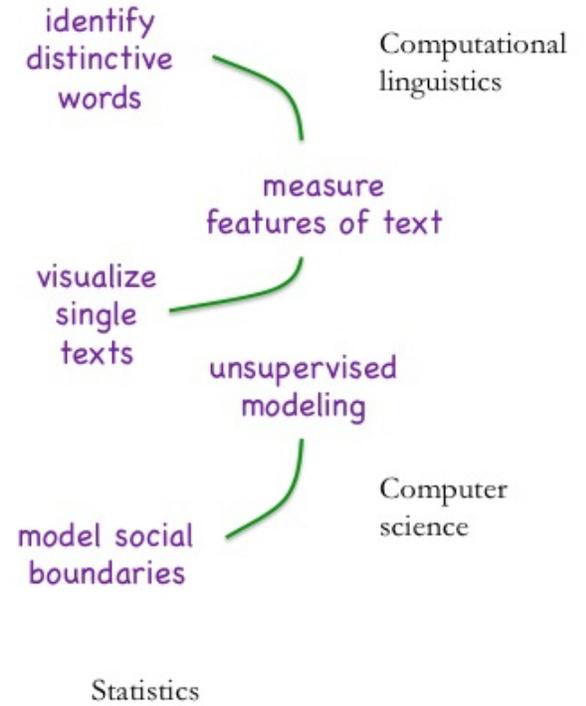
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Corpus linguistics

Book history

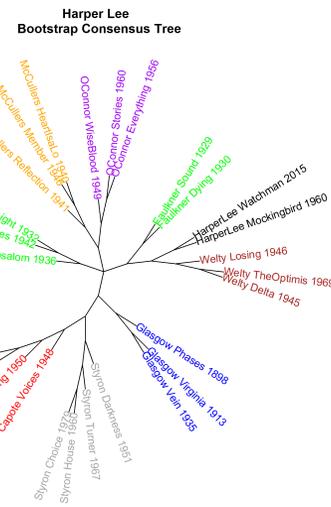
Literary history

Sociology



15 @distantviewing

100-650 MFW Culled @ 0-100%  
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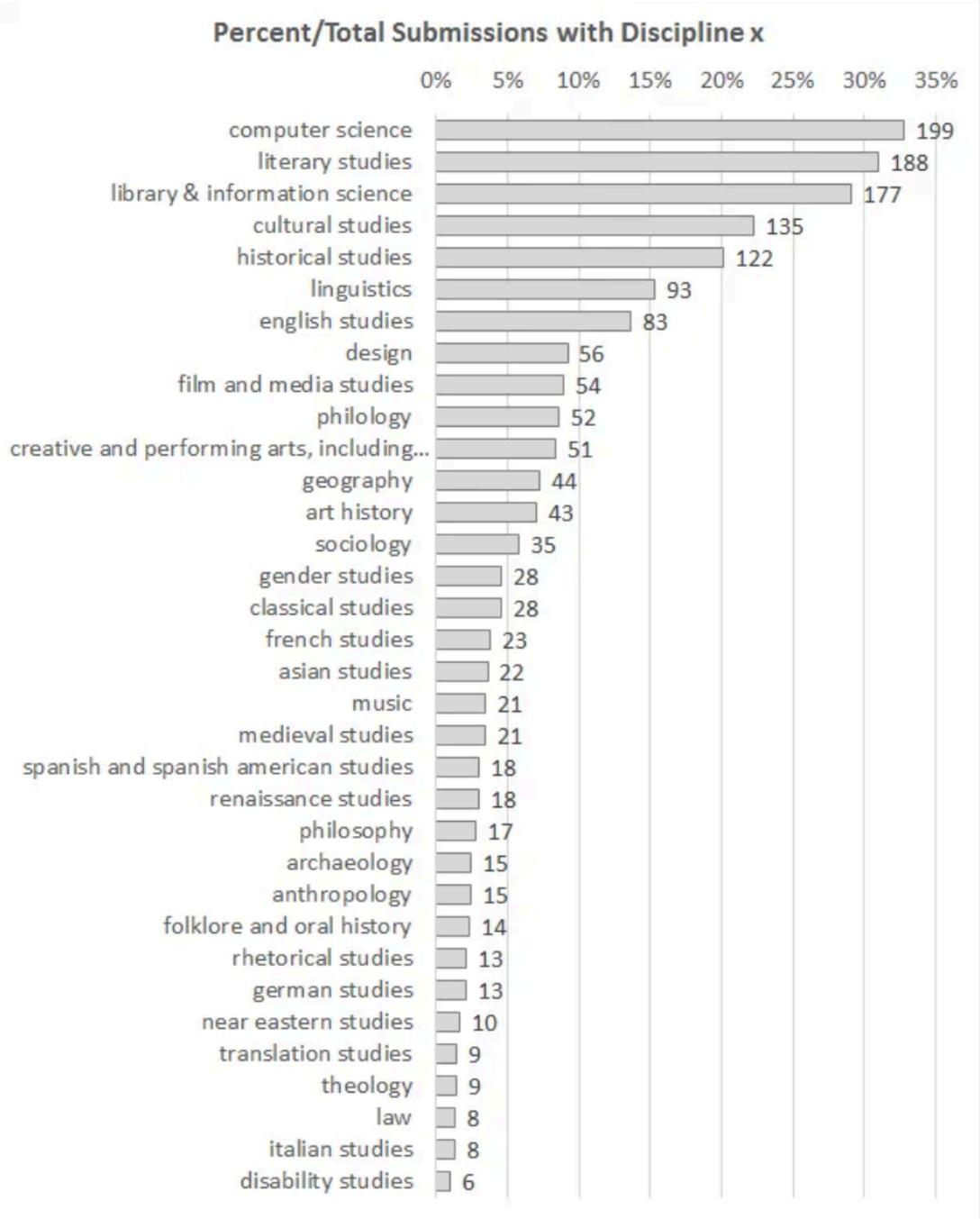
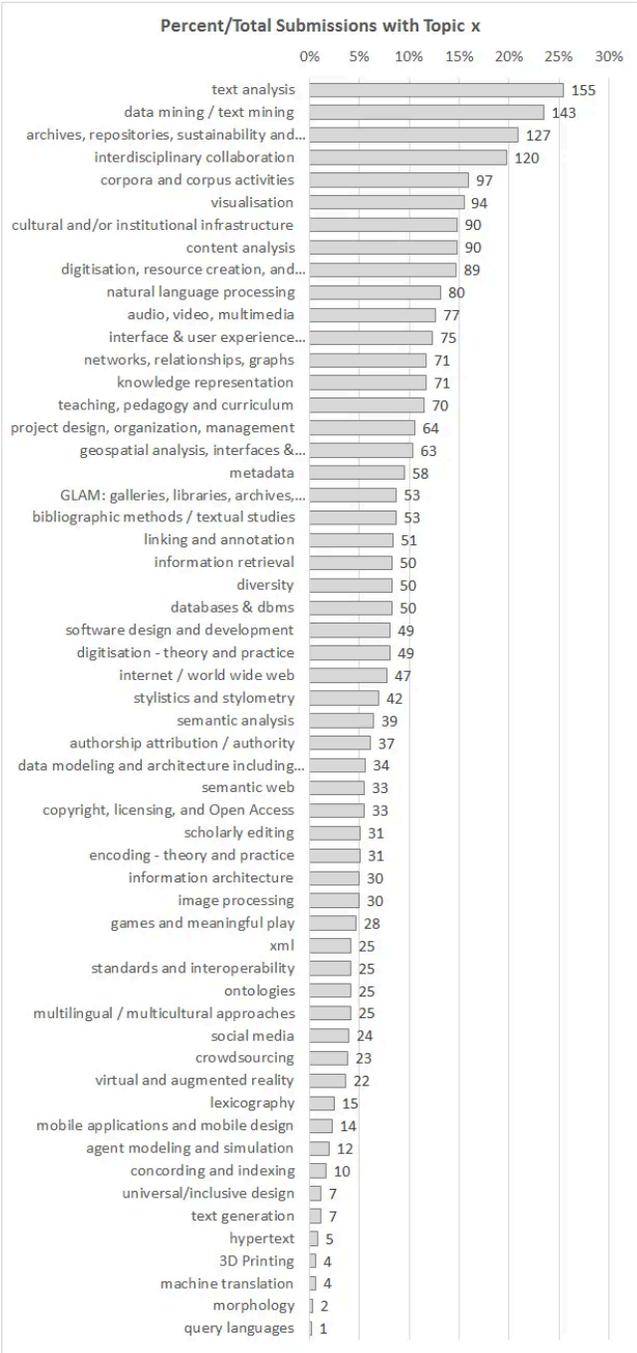


Stylometry with R: enter analysis parameters

INPUT & LANGUAGE	FEATURES	STATISTICS	SAMPLING	OUTPUT
FEATURES:	words <input checked="" type="radio"/>	chars <input type="radio"/>	ngram size <input type="text" value="1"/>	
MFW SETTINGS:	Minimum <input type="text" value="100"/>	Maximum <input type="text" value="100"/>	Increment <input type="text" value="100"/>	Start at freq. rank <input type="text" value="1"/>
CULLING:	Minimum <input type="text" value="0"/>	Maximum <input type="text" value="0"/>	Increment <input type="text" value="20"/>	List Cutoff <input type="text" value="5000"/> Delete pronouns <input type="checkbox"/>
VARIOUS:	Existing frequencies <input type="checkbox"/>	Existing wordlist <input type="checkbox"/>	Select files manually <input type="checkbox"/>	List of files <input type="checkbox"/>

OK

Sources:  
 (Left Top) Voyant. [Voyant-tools.org](http://Voyant-tools.org)  
 (Right Top) Ted Underwood. Blog. <https://tedunderwood.com/2015/06/04/seven-ways-humanists-are-using-computers-to-understand-text/>  
 (Left Bottom) Eder and Rybicki, "Go Set A Watchman while we Kill the Mockingbird In Cold Blood". [https://sites.google.com/site/computationalstylistics/projects/lee\\_vs\\_capote](https://sites.google.com/site/computationalstylistics/projects/lee_vs_capote) and Stylo R Package interface: <https://journal.r-project.org/archive/2016/RJ-2016-007/RJ-2016-007.pdf>



“A longitudinal study of intellectual cohesion in digital humanities using bibliometric analyses.”

*Journals:* Journal of Digital Humanities, Digital Humanities Quarterly, International Journal of Humanities and Arts Computing, Digital Medievalist, Digital Studies, Literary and Linguistics Computing

*Years:* 1989 – 2014

*Articles:* 2115 articles

*Citation:* Muh-Chyun Tang, Yun Jen Cheng, and Kuang Hua Chen. “A longitudinal study of intellectual cohesion in digital humanities using bibliometric analyses”. *Scientometrics*. Nov 2017, Vol. 113, Issue 2, pp 985-1008.

The most frequent author keywords in three stages

	1987-1995	frq	1996-2004	frq	2005-2014	frq
1	Humanities computing	2	Humanities computing	8	Digital humanities	202
2	Applications of microcomputers	1	SGML	6	Humanities	49
3	Art history	1	Dialect	4	Digital libraries	39
4	Artificial intelligence	1	Dialectology	4	Big data	32
5	CAI in literature	1	Dialectometry	4	Ontologies	25
6	Chaos theory	1	Digital libraries	4	Technology	22
7	Cognition	1	Electronic texts	4	Text mining	20
8	Collaborative writing and exams	1	Literary criticism	4	GIS	19
9	Computing	1	Literary theory	4	Metadata	19
10	Conceptual convergence	1	Metadata	4	Annotation	18
11	Concordances	1	XML	4	Collaboration	18
12	Creativity	1	Archive	3	Digitization	18
13	Databases	1	Link	3	History	18
14	Discourse	1	Multi-media	3	Linked open data	18
15	Education	1	TEI	3	XML	17

**Current Issue**

> [2019: 13.1](#)

**Preview Issue**

> [2019: 13.2](#)

**Previous Issues**

> [2018: 12.4](#)

> [2018: 12.3](#)

> [2018: 12.2](#)

> [2018: 12.1](#)

> [2017: 11.4](#)

> [2017: 11.3](#)

> [2017: 11.2](#)

> [2017: 11.1](#)

> [2016: 10.4](#)

> [2016: 10.3](#)

> [2016: 10.2](#)

> [2016: 10.1](#)

> [2015: 9.4](#)

> [2015: 9.3](#)

> [2015: 9.2](#)

> [2015: 9.1](#)

**2019 13.1**

**Articles**

[Managing 100 Digital Humanities Projects: Digital Scholarship & Archiving in King's Digital Lab](#)

James Smithies, King's College London; Carina Westling, King's College London; Anna-Maria Sichani, King's College London; Pam Mellen, King's College London; Arianna Ciula, King's College London

Abstract [en]

[Modelling Medieval Hands: Practical OCR for Caroline Minuscule](#)

Brandon W. Hawk, Rhode Island College; Antonia Karaisl, Rescribe Ltd; Nick White, Rescribe Ltd

Abstract [en]

[Towards 3D Scholarly Editions: The Battle of Mount Street Bridge](#)

Costas Papadopoulos, Maastricht University; Susan Schreibman, Maastricht University

Abstract [en]

**Case Studies**

[Music Scholarship Online \(MuSO\): A Research Environment for a More Democratic Digital Musicology](#)

Timothy C. Duguid, University of Glasgow; Maristella Feustle, University of North Texas; Francesca Giannetti, Rutgers University; Elizabeth Grumbach, Arizona State University

Abstract [en]

**Browse issues**

Year: 2019 | Issue: Volume 34, Issue 3, September 2019, Pages 471-706 | [Browse by volume](#)



Volume 34, Issue 3  
September 2019  
Cover image  
ISSN 2055-7671  
EISSN 2055-768X

**Original Articles**

Book Reviews  
Corrigendum

< Previous

**Volume 34, Issue 3, September 2019**

**ORIGINAL ARTICLES**

**Representing stories as interdependent dynamics of character activities and plots: A two-mode network relational event model**

Dingding Chao, Taro Kanno, Kazuo Furuta, Chen Lin

*Digital Scholarship in the Humanities*, Volume 34, Issue 3, September 2019, Pages 471-481.  
<https://doi.org/10.1093/llc/ftq062>

Abstract | View article

**Johnson, 'Misargyrus', and Richard Bathurst**

Peter Dixon, David Mannion, W G Burgess

*Digital Scholarship in the Humanities*, Volume 34, Issue 3, September 2019, Pages 482-492.  
<https://doi.org/10.1093/llc/ftq047>

Abstract | View article

**Attributing the Bixby Letter using n-gram tracing**

Jack Grieve, Isobelle Clarke, Emily Chiang, Hannah Gideon, Annina Heini ...

*Digital Scholarship in the Humanities*, Volume 34, Issue 3, September 2019, Pages 493-512.  
<https://doi.org/10.1093/llc/ftq042>

Abstract | View article

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[Negation and Speculation Detection. Noa P. Cruz Díaz and Manuel J. Maña López](#)

[Author identification with feature transformation method](#)

[Representations of Poverty and Place: Using](#)

# 2. A Visual Turn



“Digital humanities is text heavy, visualization light,  
and simulation poor”

Erik Malcolm Champion | DSH 2017

“The visual side of digital humanities: a survey on topics,  
researchers, and epistemic cultures”

Sandy Muster and Melissa Terras | DSH 2019

Visual Digital Turn: The visual digital turn: Using neural  
networks to study historical images

Melvin Weavers and Thomas Smits | DSH 2019

DHQ Special Issue: Film and Media Studies

Co-Editors: Manuel Burghardt, Adelheid Heftberger, Johannes Pause,  
Niels-Oliver Walkowski & Matthias Zeppelzauer

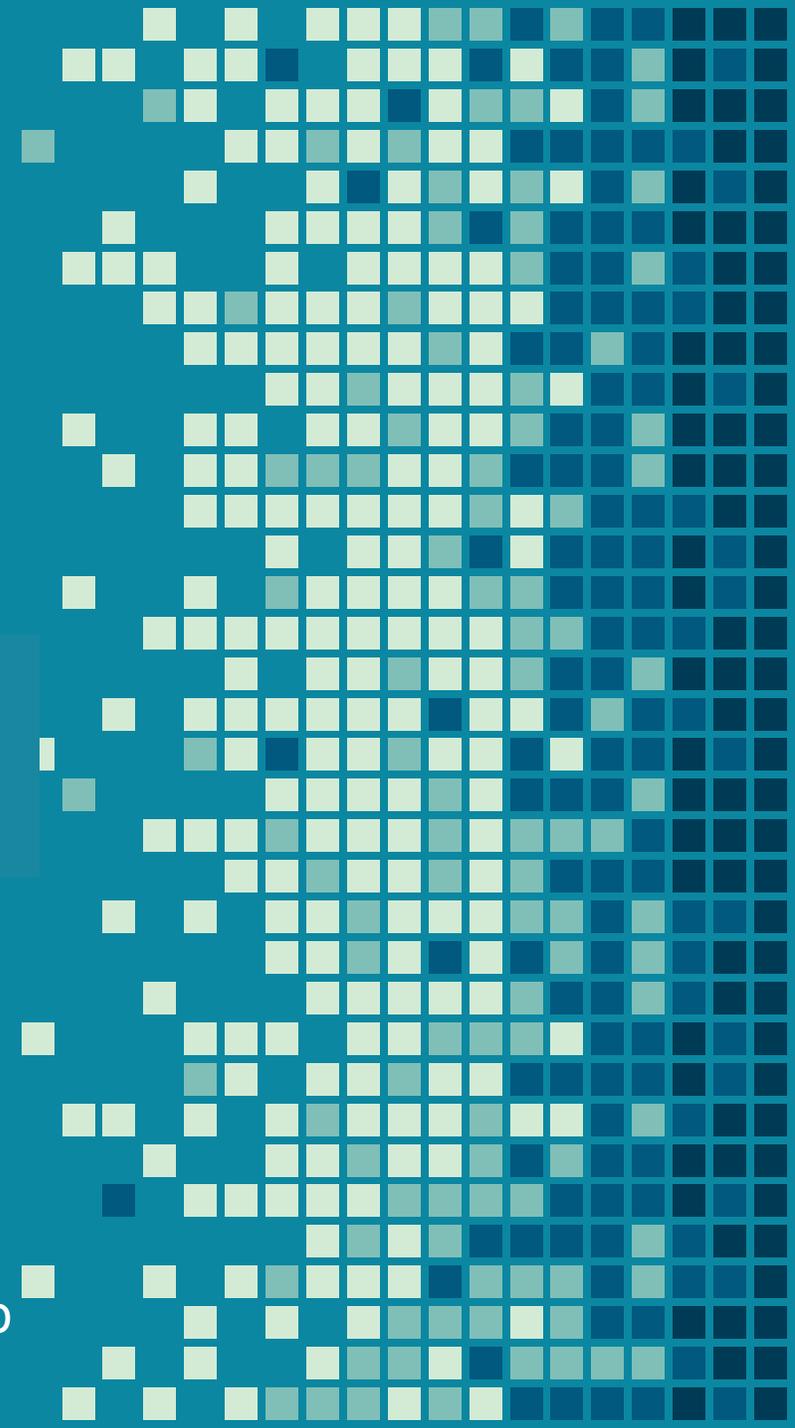
Forthcoming.

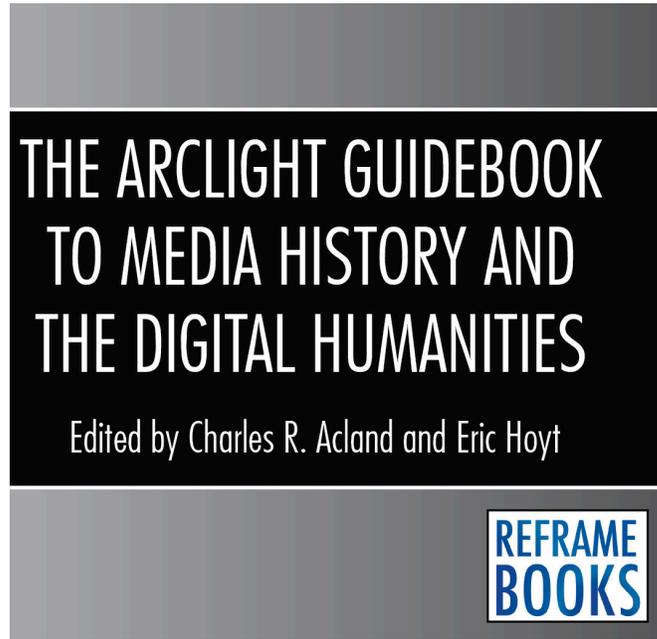
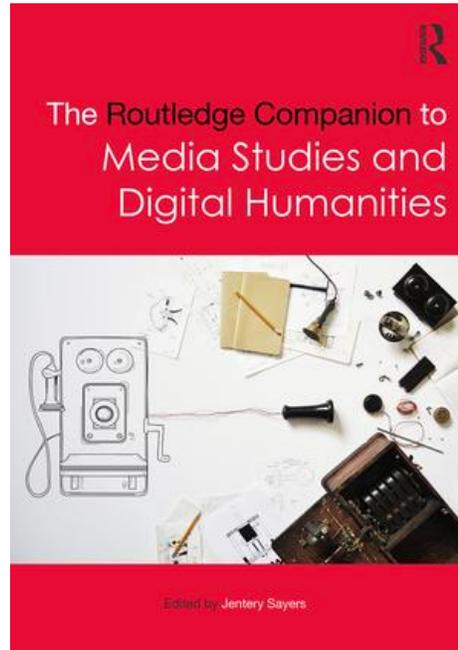
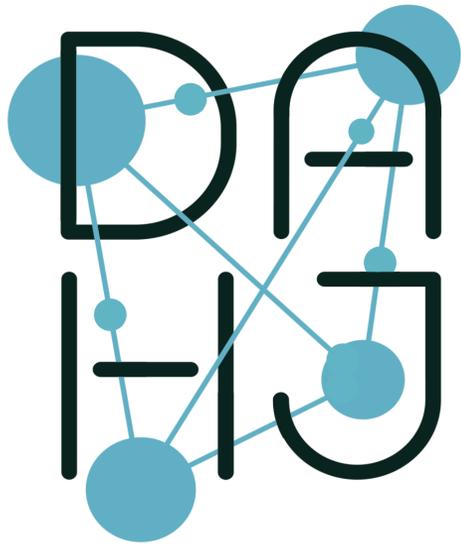
DHQ Special Issue: AudioVisual in DH

Co-editors: Taylor Arnold, Stef Scagliola, Lauren Tilton, Jasmijn van Gorp

20 @distantviewing

Forthcoming





CA

Journal of Cultural Analytics

Search  ISSN 2371-4549

Articles

Data Sets

Clusters

Debates

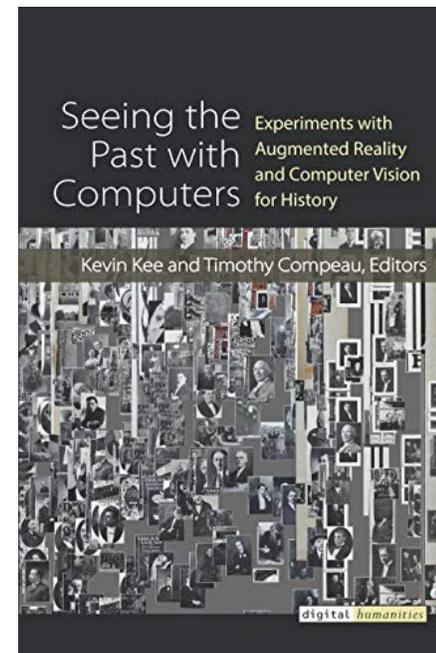
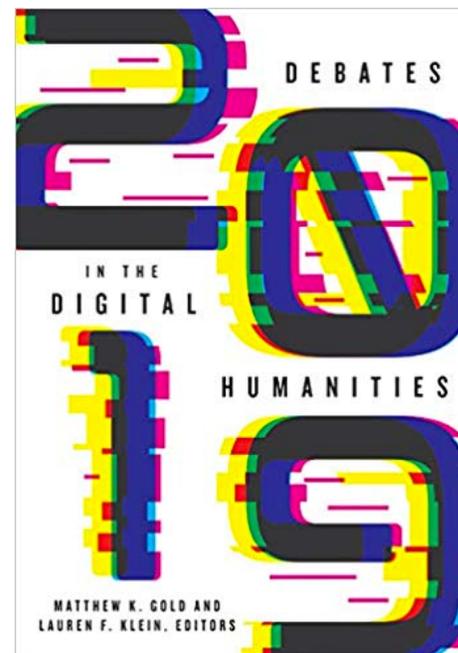
Articles  
**The Canon of Dutch Literature According to Google**  
 Lucas Van Der Deijl, Roel Smeets, And Antal Van Den Bosch

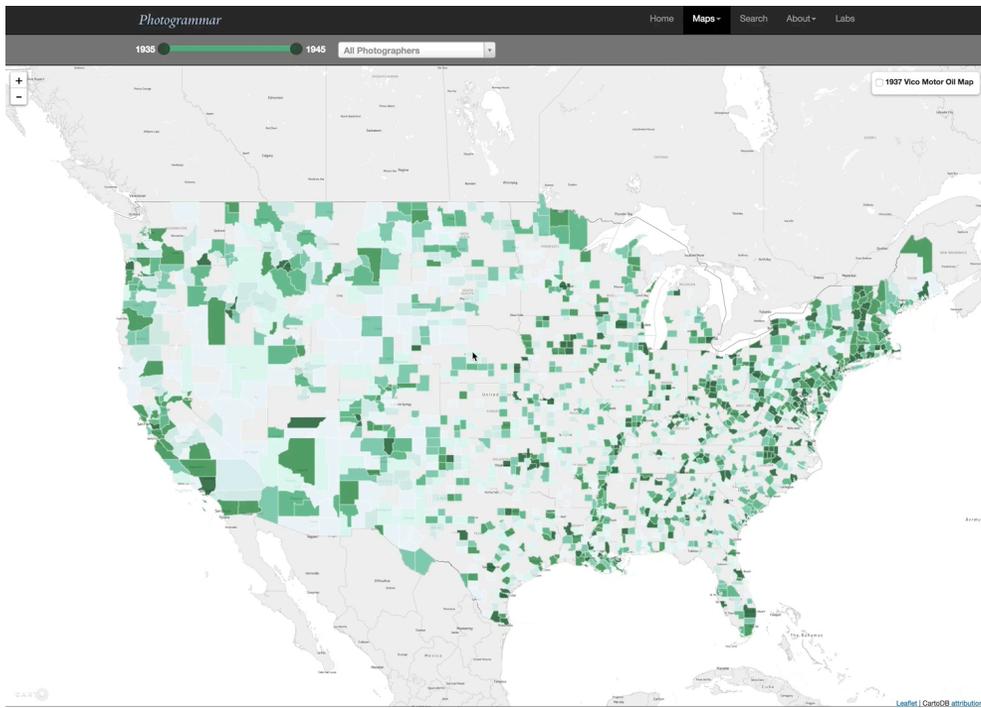
Debates  
**Is there a text in my data? (Part 1): On Counting Words**  
 Michael Gavin

Debates  
**Are We Breaking the Social Contract?**  
 Giovanni Colavizza

Clusters  
**Special Forum on Responses to Nan Z. Da**

Articles  
**Visual Style in Two Network Era Sitcoms**  
 Taylor Arnold, Lauren Tilton, And Annie Berke





# RENEWING INEQUALITY

Urban Renewal, Family Displacements, and Race 1955-1966



For a quarter century, the federal government provided funding for cities large and small to raze "blighted" or "slum" neighborhoods. Though improved housing opportunities was the ostensible goal, over time, cities used federal funds to stimulate commercial and industrial redevelopment. Through these programs, cities displaced hundreds of thousands of families from their homes and neighborhoods. *Renewing Inequality* visualizes those displacements and urban renewal more generally.

NEXT

Digital Humanities at Yale University Library

## Robots Reading Vogue

Data Mining is in Fashion

Few magazines can boast being continuously published for over a century, familiar and interesting to almost everyone, full of iconic pictures — and also completely digitized and marked up as both text and images. What can you do with over 2,700 covers, 400,000 pages, 6 TB of data? Students, librarians and faculty are excited about the possibilities of working with Vogue to explore questions in fields from gender studies to computer science. We highlight some early experiments below:

<h3>Slice Histograms</h3> <p>Direct visualization of color patterns.</p> <p>Explore »</p>	<h3>Cover Averages</h3> <p>Visual continuity and change across the decades.</p> <p>Explore »</p>	<h3>n-gram Search</h3> <p>Search and compare word usage in 400,000+ pages within ads, articles, or all texts.</p> <p>Explore »</p>	<h3>Topic Modeling</h3> <p>Self-organizing themes determined by word cooccurrence.</p> <p>Explore »</p>
<h3>Advertisements</h3> <p>Sort ads by frequency, date, and industry.</p> <p>Explore »</p>	<h3>Statistics</h3> <p>View figures on circulation, ratio of articles to advertisements, price per issue, and number of pages per year.</p> <p>Explore »</p>	<h3>Student Work</h3> <p>See projects conducted by Yale students using this data.</p> <p>Explore »</p>	<h3>Colormetric Space</h3> <p>Hue, Saturation and Lightness.</p> <p>Explore »</p>

SAT

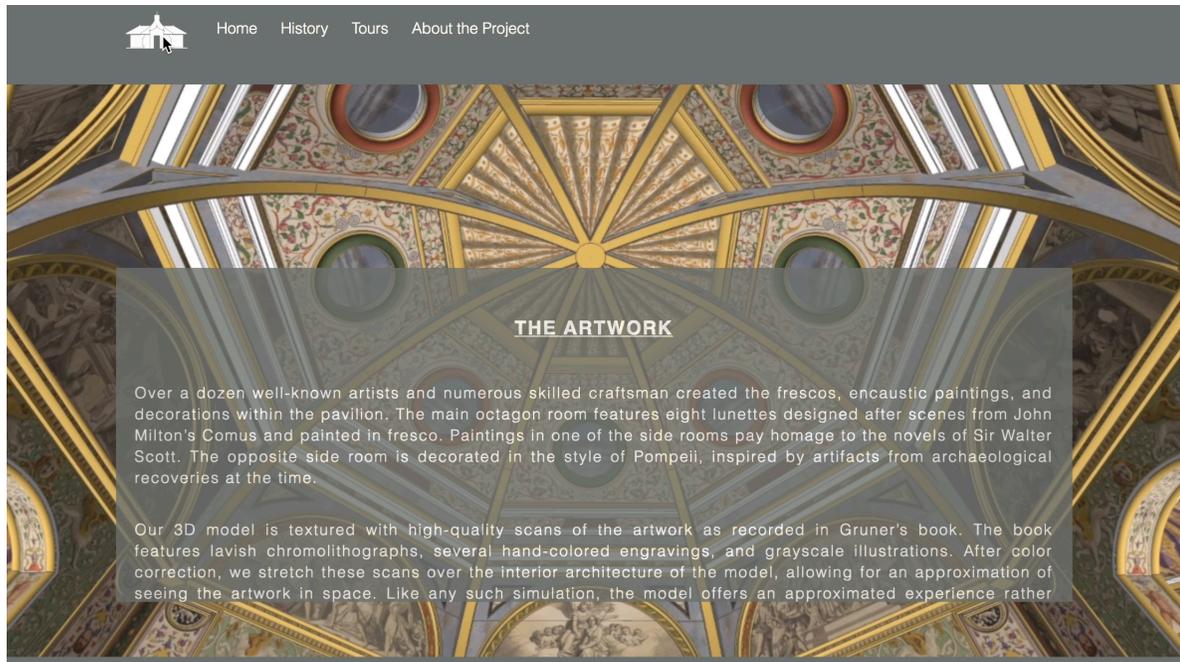
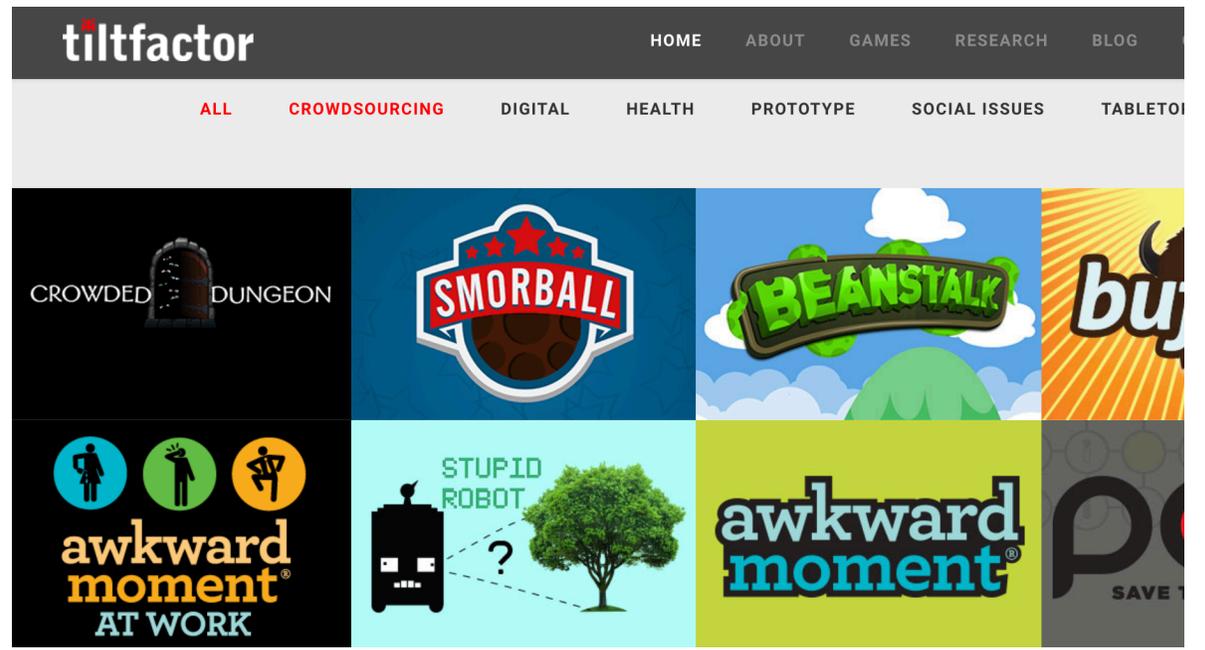
Semantic Annotation Tool

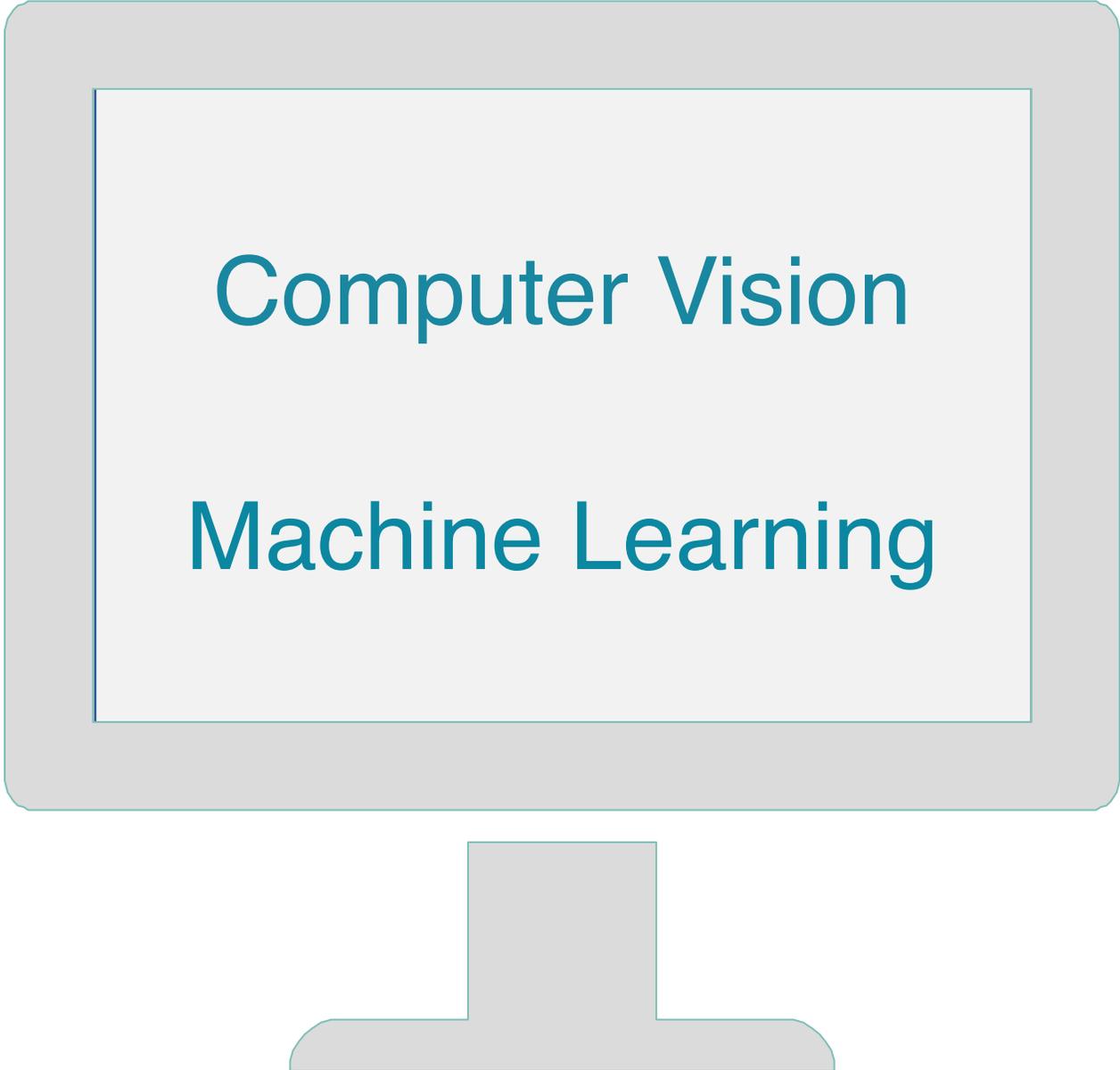
A drop-in jQuery plugin for video annotation supporting collaborative analysis and accessibility

1

2

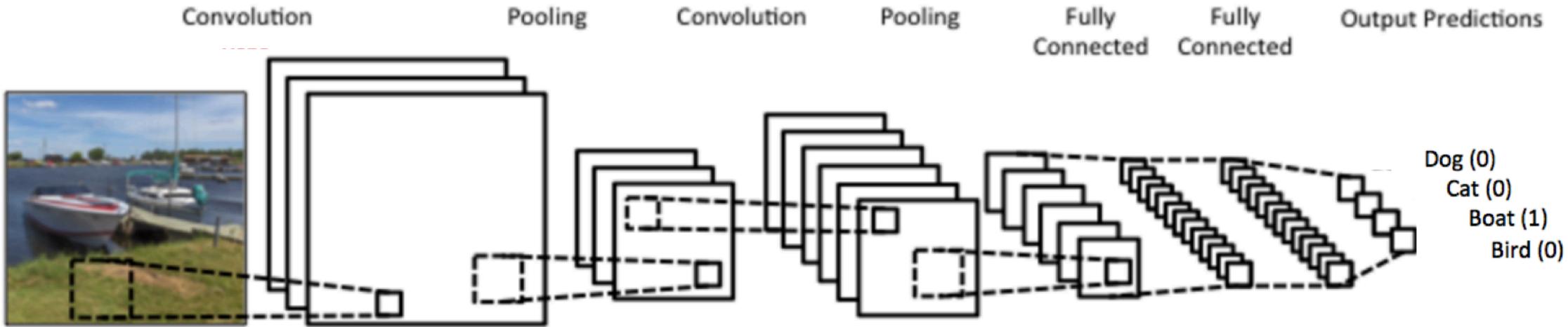
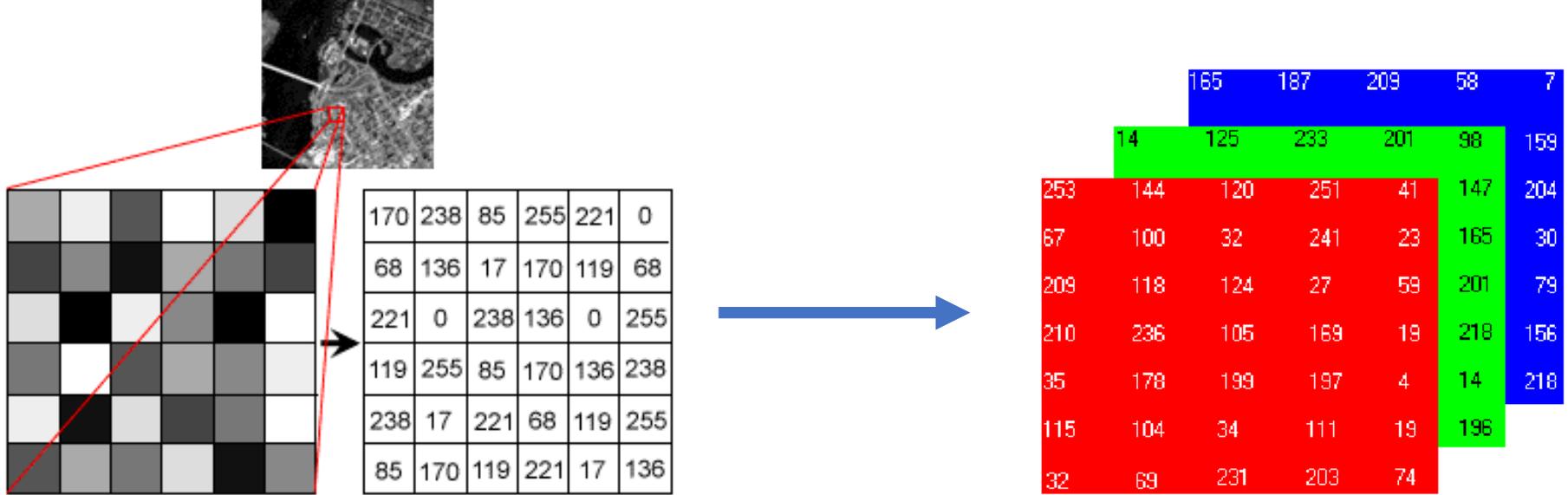
3





**Computer Vision**

**Machine Learning**



Feature Extraction from Image

Classification

# 3. Distant Viewing Lab

University of Richmond





# Distant Viewing Lab

## PAPERS

[Distant Viewing: Analyzing Large Visual Corpora](#)  
[Visual Style in Two Network-Era Sitcoms](#)

## SOFTWARE

[Distant Viewing Toolkit \(DVT\)](#)

## TUTORIALS

[Deep Learning for Analyzing Large Image Corpora](#)  
[HILT2019: Image Analysis with Deep Learning](#)

With support from:



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## Analyzing Visual Culture

The Distant Viewing Lab uses and develops computational techniques to analyze visual culture on a large scale. It develops tools, methods, and datasets that can be re-used by other researchers. The lab engages closely with critical cultural and data studies, aiming to make explicit the interpretive act of algorithmic logic. The Lab is directed by [Taylor Arnold](#) and [Lauren Tilton](#) and located at the University of Richmond.

For the theoretical underpinnings of the lab, see the following paper:

["Distant Viewing: Analyzing Large Visual Corpora."](#)

Taylor Arnold and Lauren Tilton. Digital Scholarship in the Humanities.  
Published online 15 March 2019.

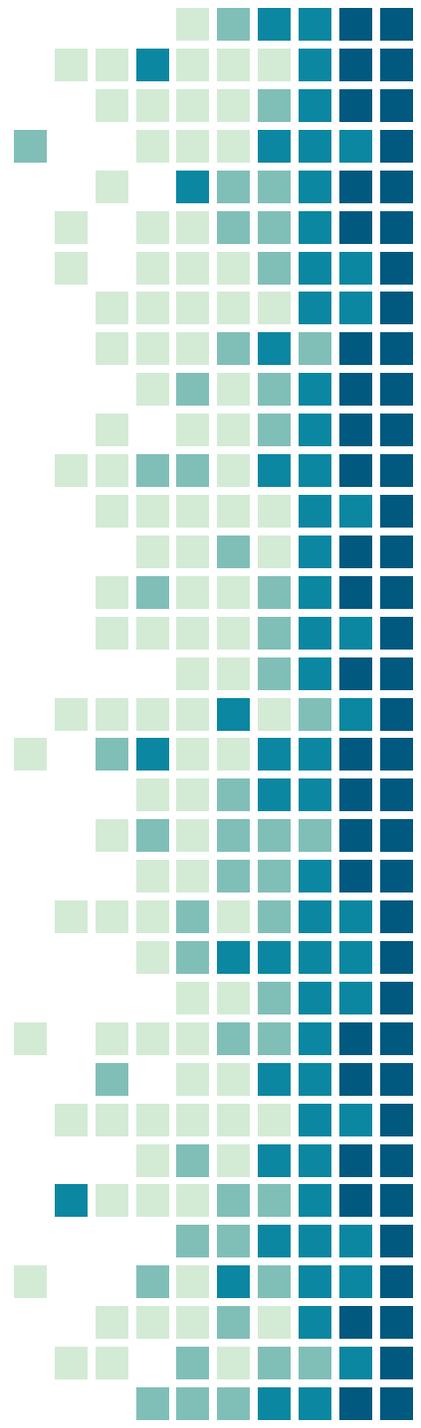
An example of the current results from our [Distant Viewing Toolkit](#) is shown below.

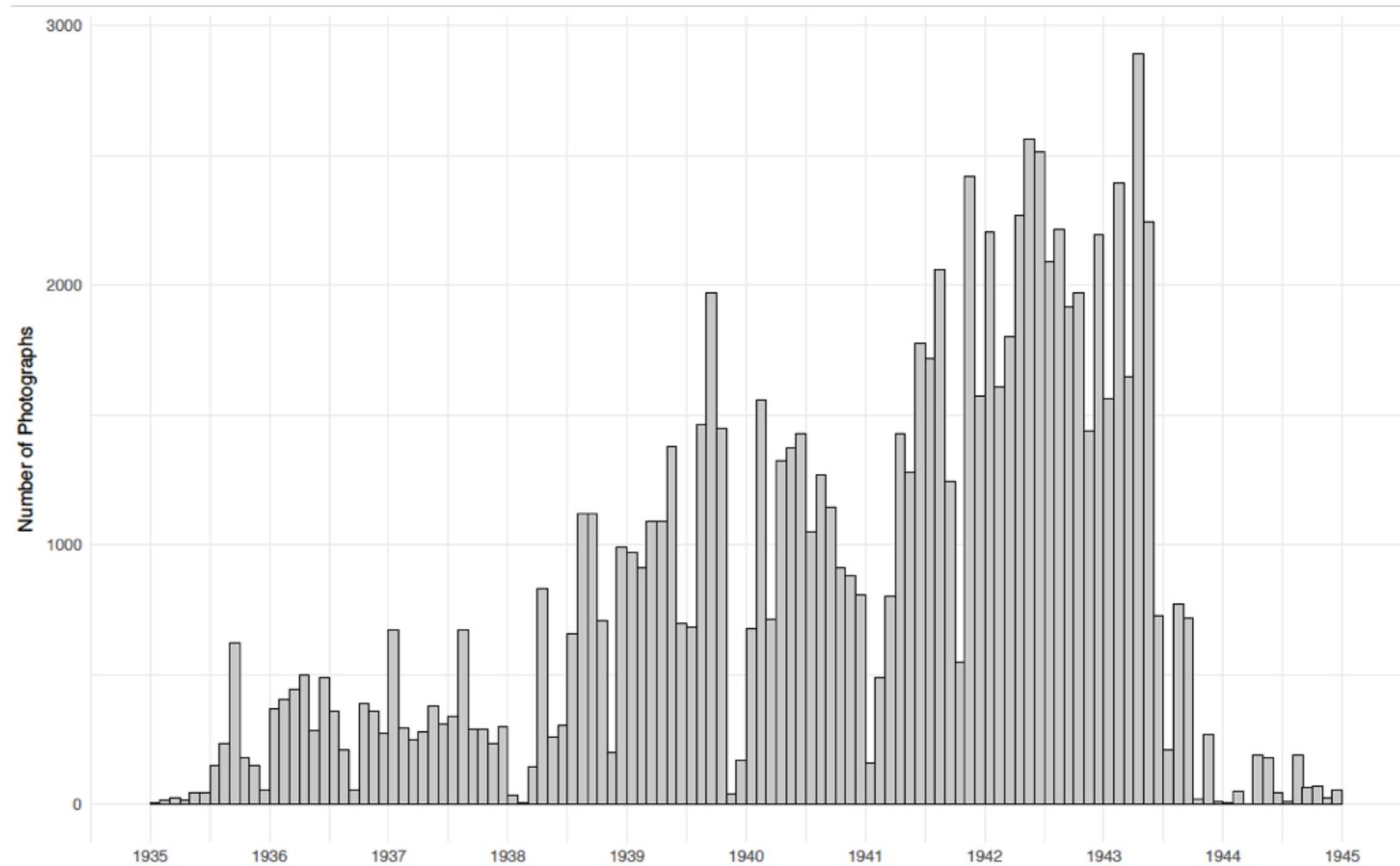
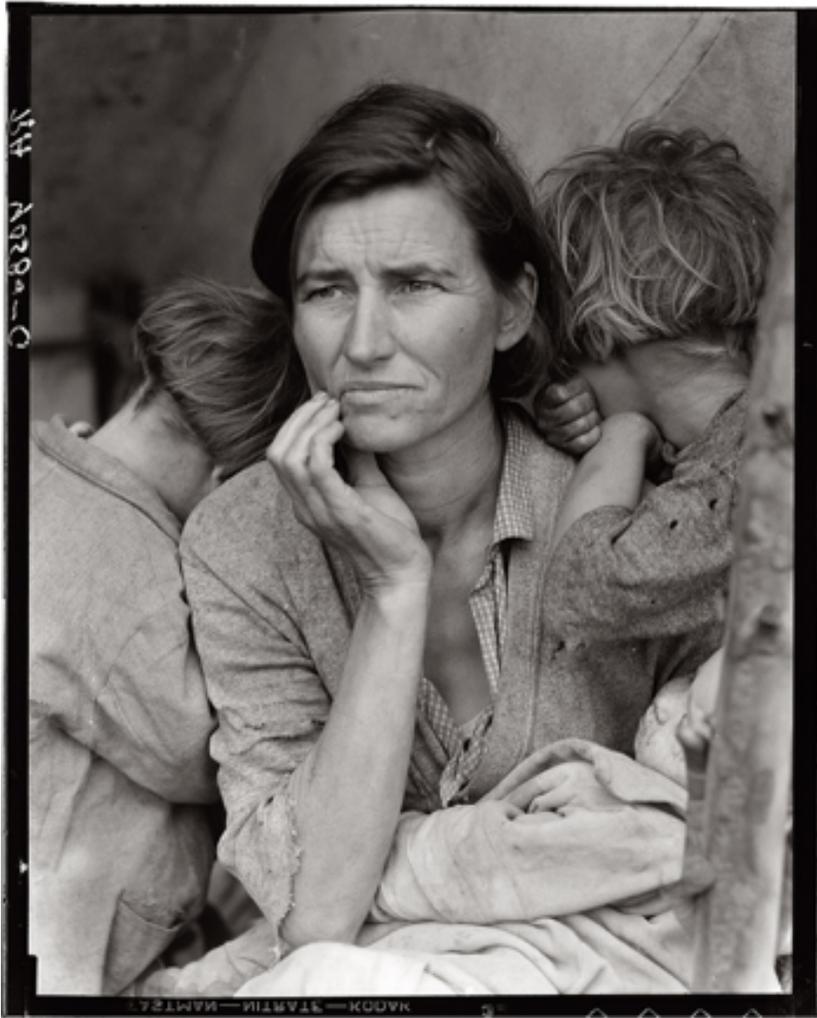


# Distant Viewing is a process that...

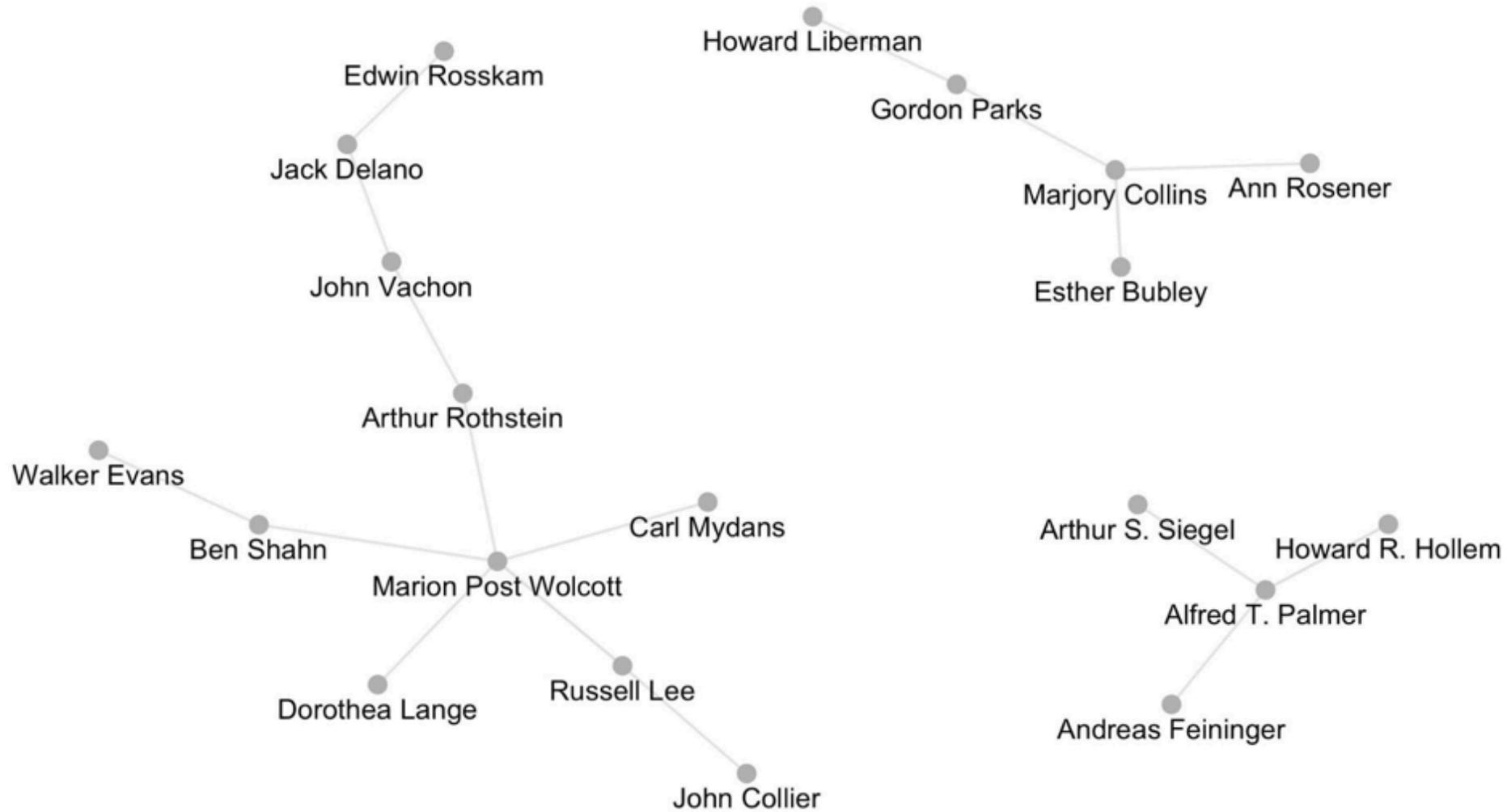
- Explicitly encodes **semantic elements** within a collection of images using computer vision.
- Aggregates, explores, and interprets the semantic elements **at scale**.

Article: Arnold and Tilton. "Distant Viewing."  
*Digital Scholarship in the Humanities*. March 2019.









---

Article: T. Arnold and L. Tilton. "Distant Viewing." *Digital Scholarship in the Humanities*. 2019.

## Russell Lee - Navajo County, Arizona



Gorge of the Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Sharp curves are prevalent along the highway at Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Cottonwood trees line the banks of the Carrizo Creek in Navajo County, Arizona

Russell Lee  
April 1940



Gorge of Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Rocks and vegetation in the gorge of the Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Cottonwood trees in the valley floor of Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Gorge of the Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Sharp curves are prevalent along the highway at Carrizo Creek. Navajo County, Arizona

Russell Lee  
April 1940



Cottonwood trees line the banks of the Carrizo Creek in Navajo County, Arizona

Russell Lee  
April 1940



### Caption (Original Description)

Sharp curves are prevalent along the highway at Carrizo Creek. Navajo County, Arizona

### Photographer

Russell Lee

### Created

April 1940

### Location

Coconino, Arizona

### Lot Number (Shooting Assignment)

652

### Call Number (Library of Congress)

LC-USF34-035909



### Photograph Part of a Strip (Image 2 of 5)



### Similar Photos



Alfred T. Palmer, 1941 (58%)

Drill press operator, Allegheny Ludlum Steel[e] Corp., Brackenridge, Pa.



Alfred T. Palmer, 1941 (43%)

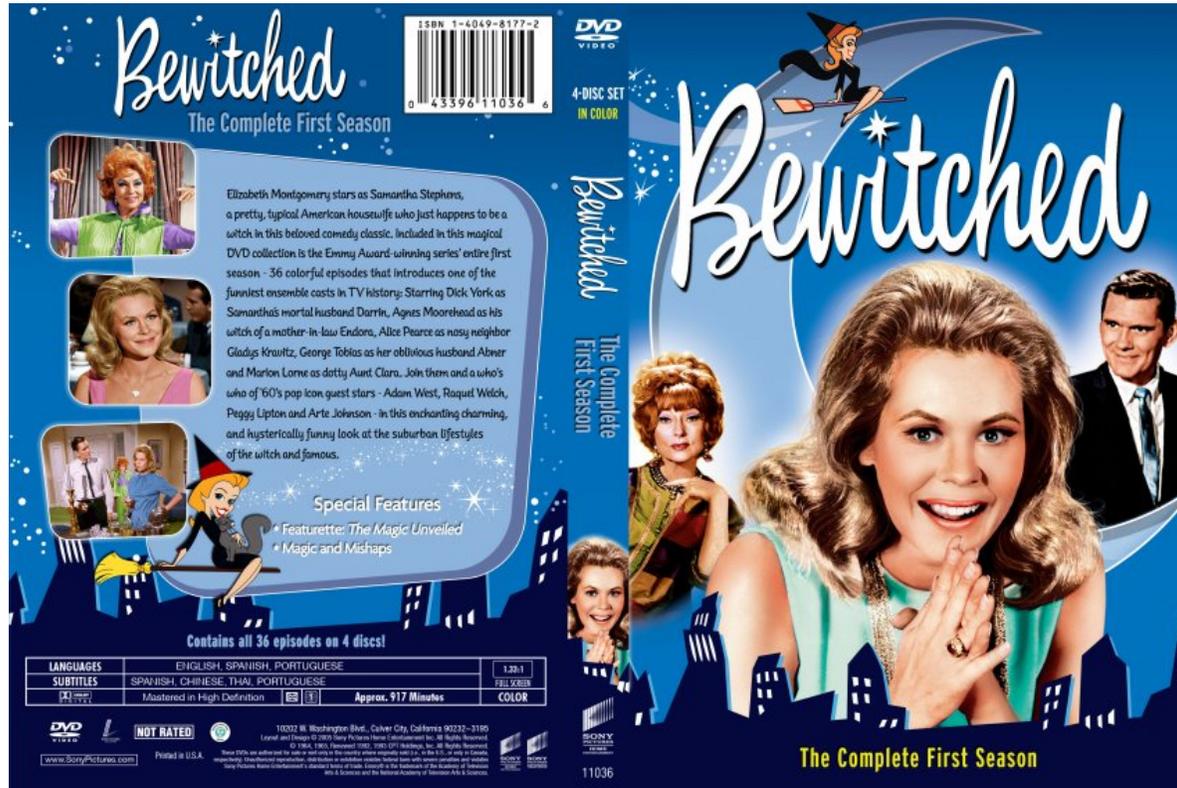
A scene in a steel mill, Republic Steel Mill, Youngstown, Ohio. Molten iron is blown in an Eastern Bessemer converter to change it to steel for war essentials

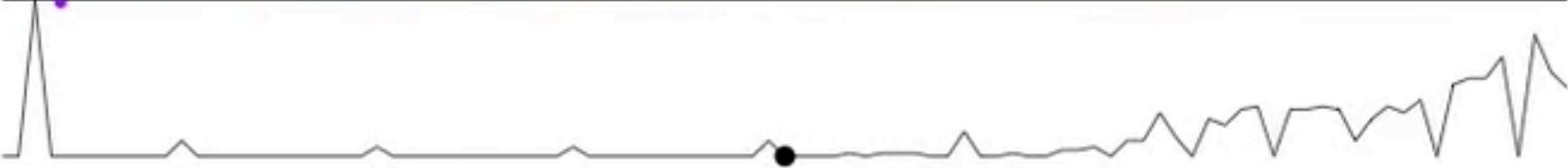


Alfred T. Palmer, 1941 (41%)

Ladle of molten iron is poured into an open hearth furnace for conversion into steel, Allegheny Ludlum Steel[e] Corp., Brackenridge, Pa. Note the safety latch

# Our Corpus — Two Network Era U.S. Sitcoms







(a) Group shot



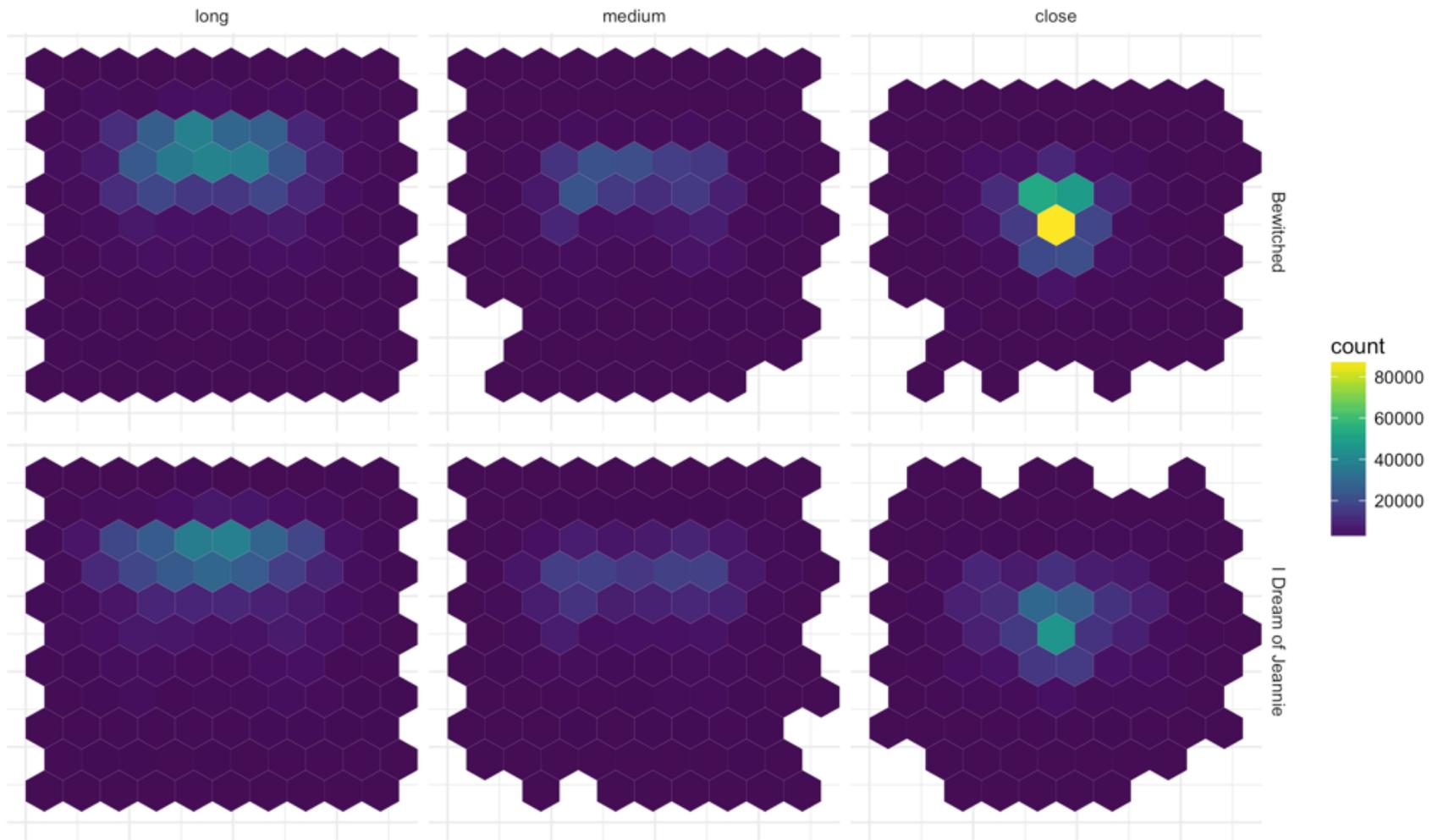
(b) Two shot



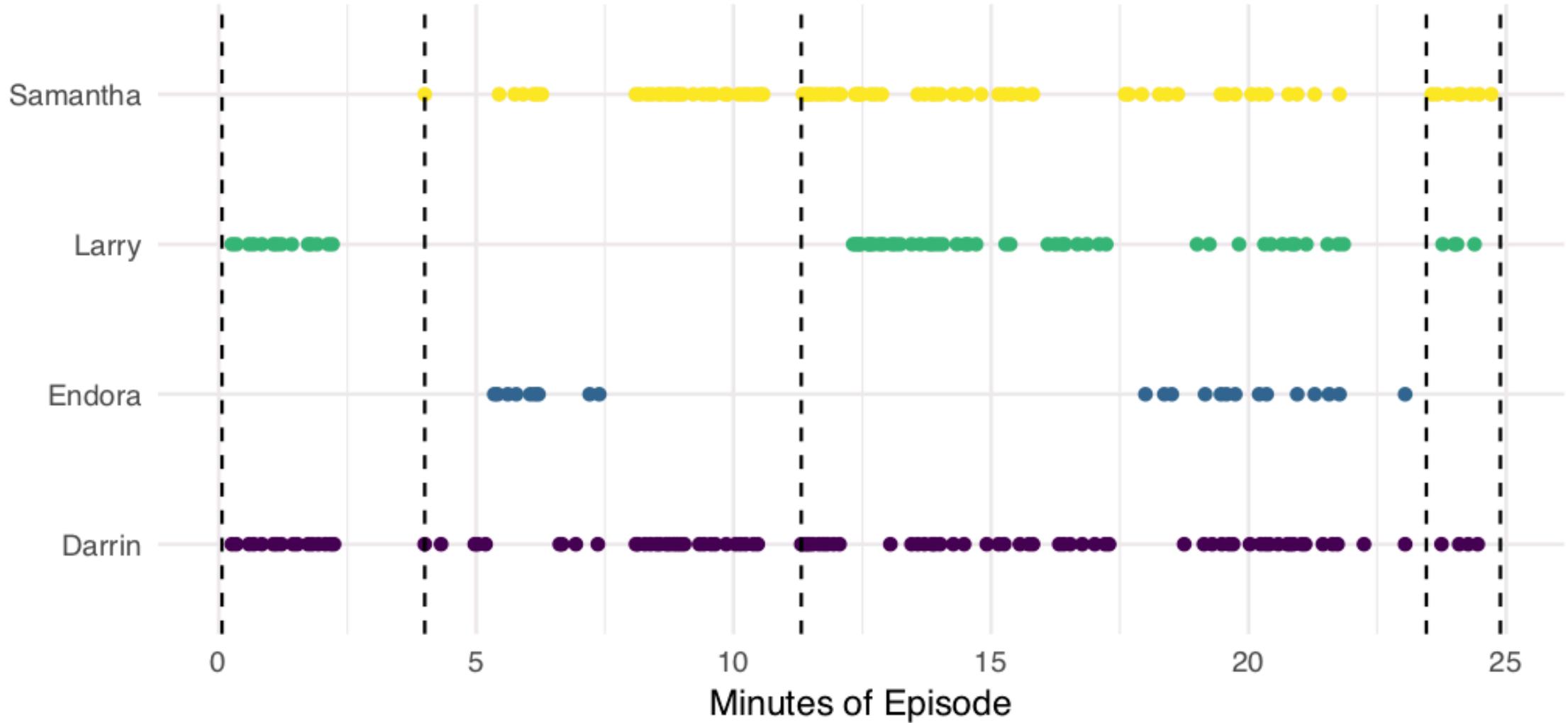
(c) Close shot



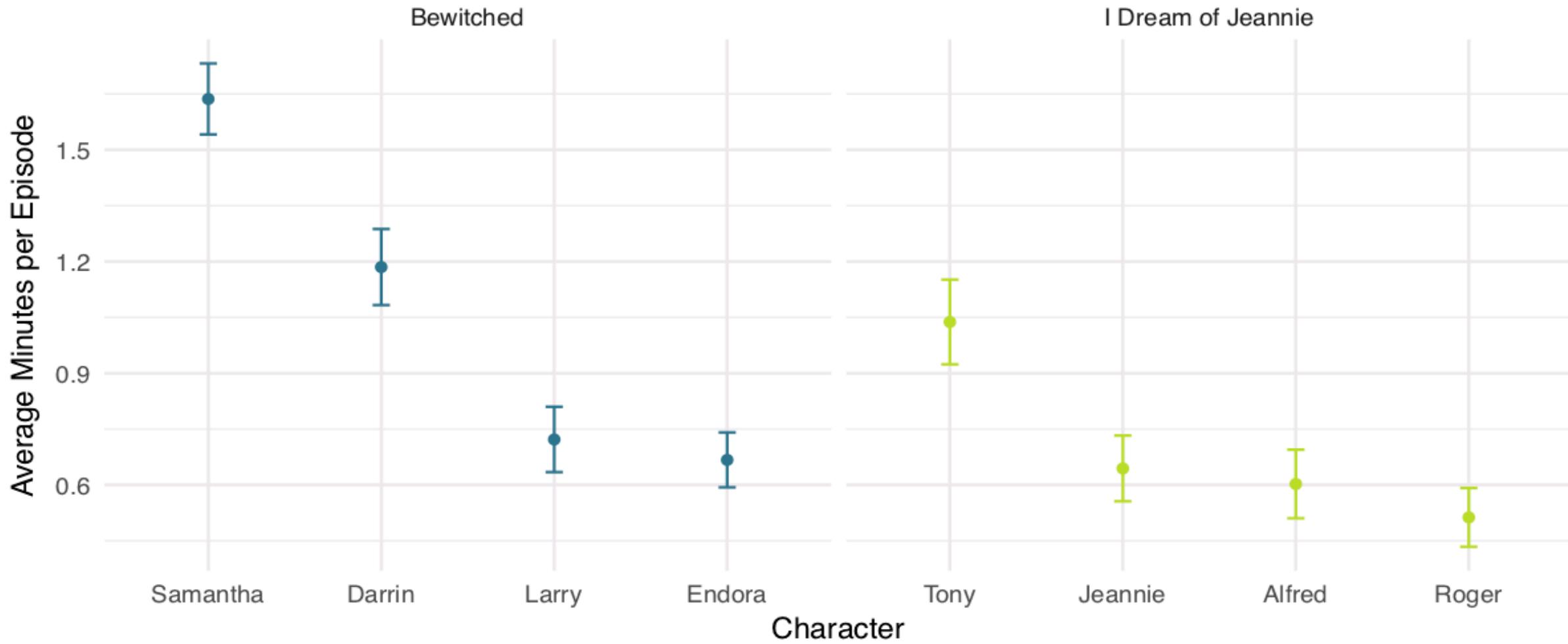
(d) Over-the-shoulder shot



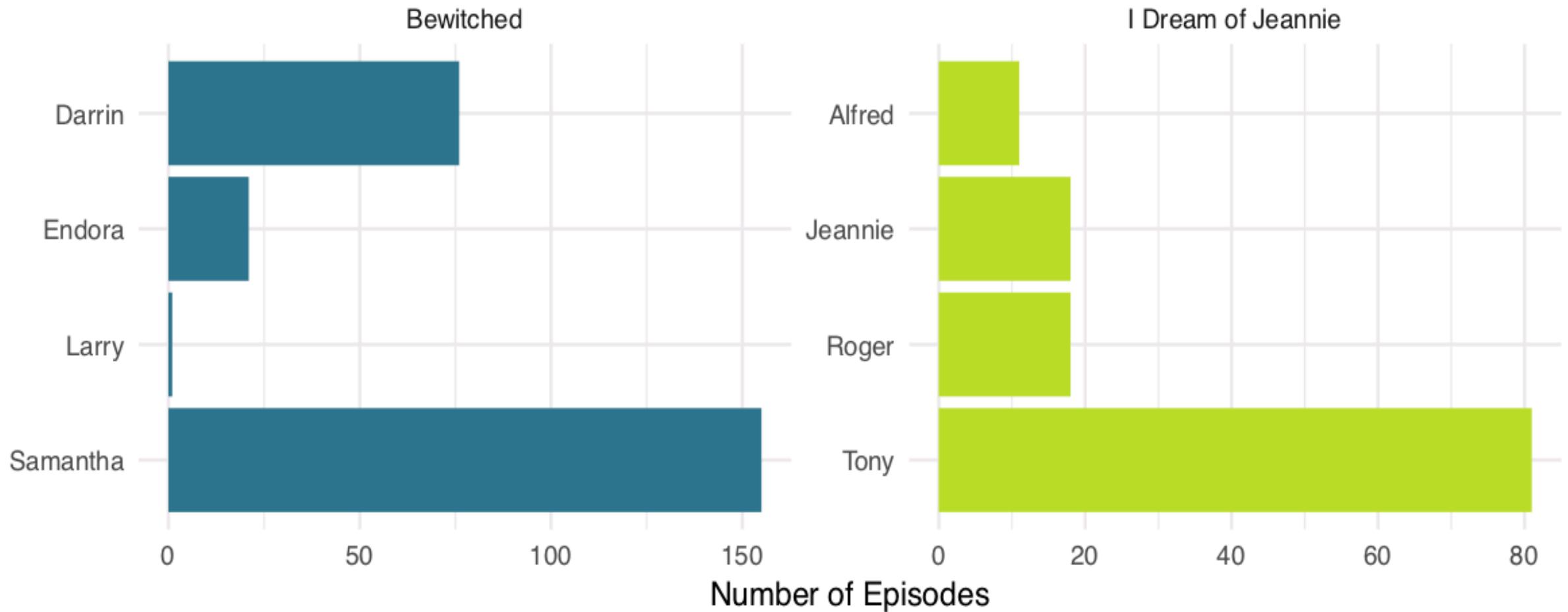
# "Business, Italian Style" (Bewitched, Season 3, Episode 7)



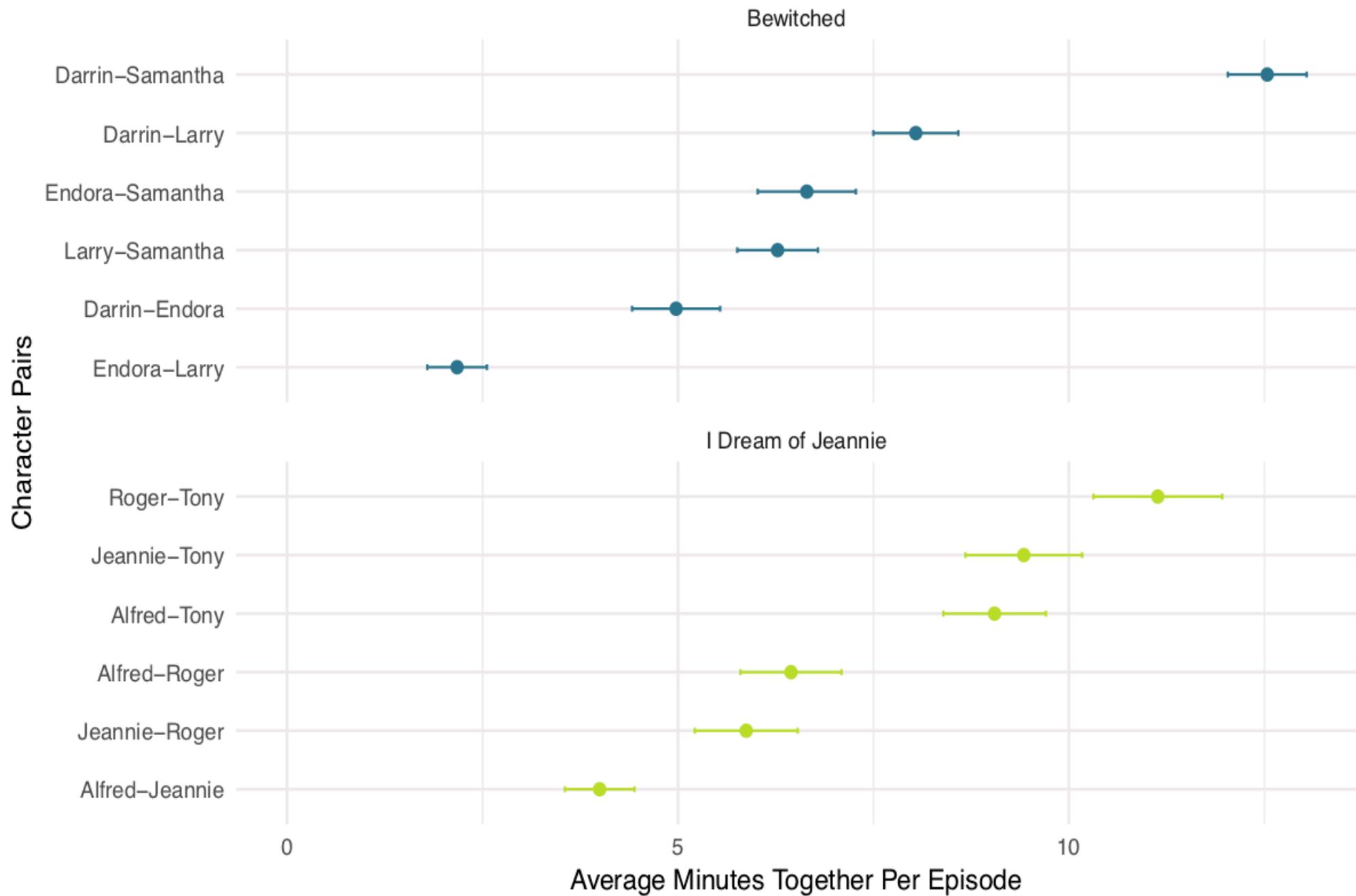
Example of the detected characters and narrative breaks from one episode of *Bewitched*.

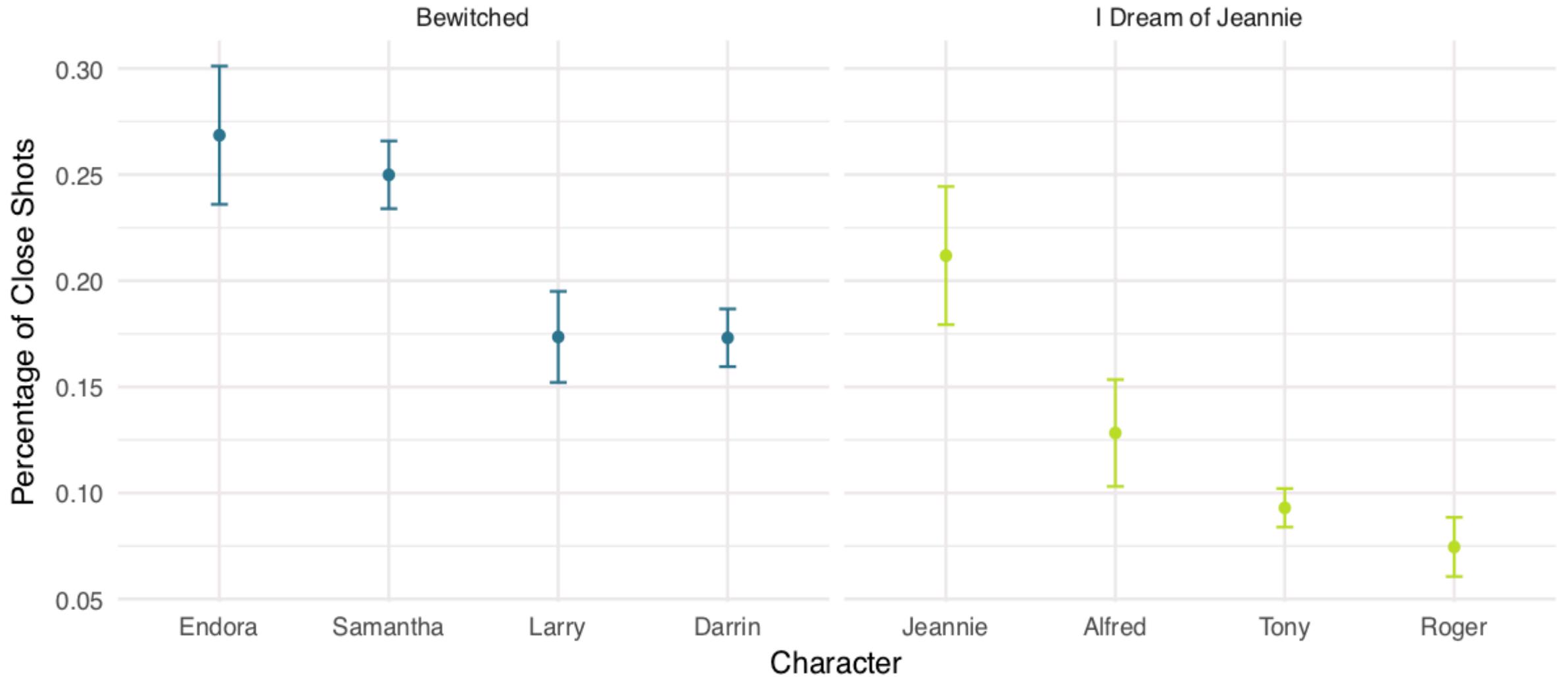


Average minutes per episode for which a character is visible in a close shot.  
 Error bars with 95% confidence intervals for the mean of each group.



Number of episodes where each character is associated with the first face detected in an episode.

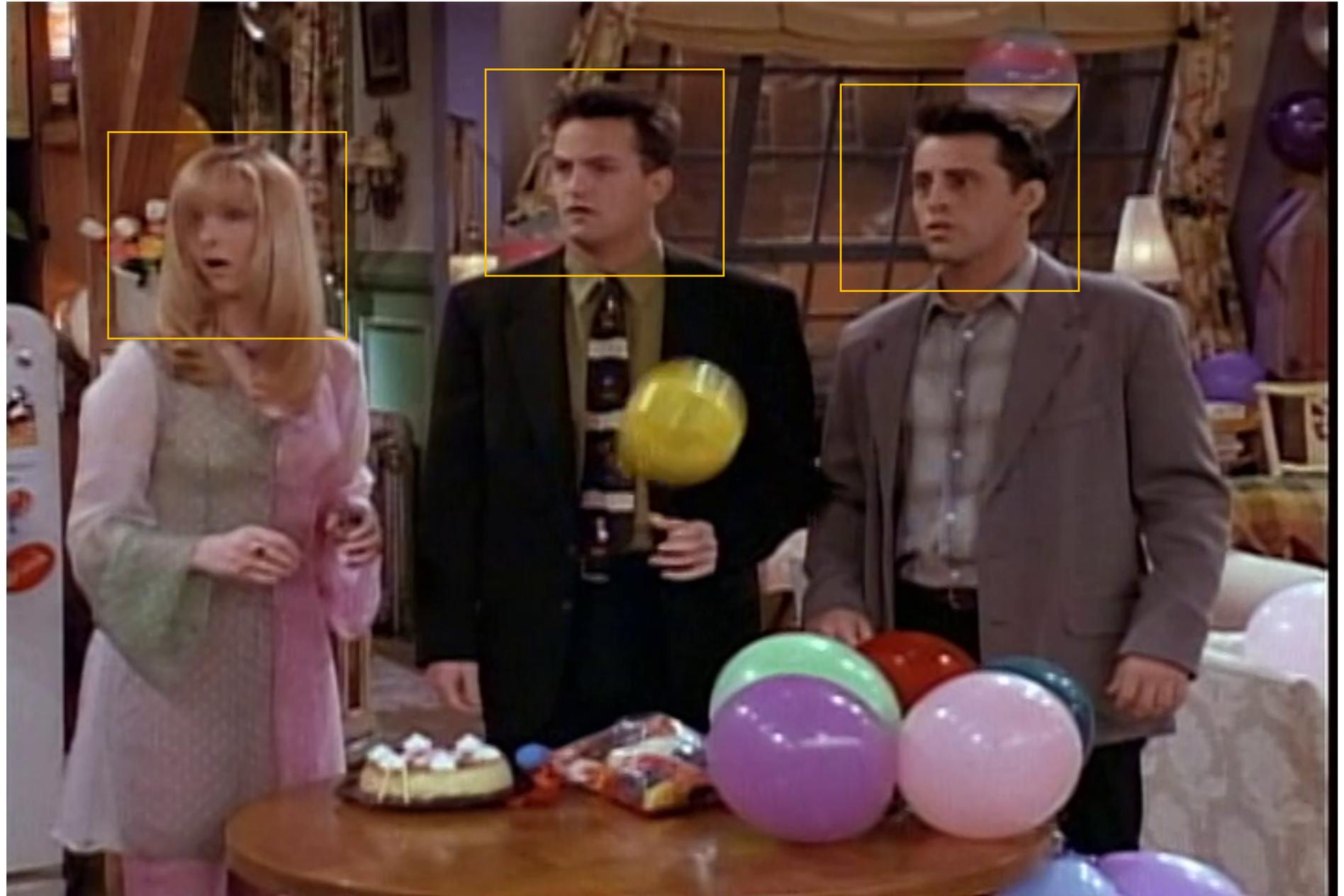


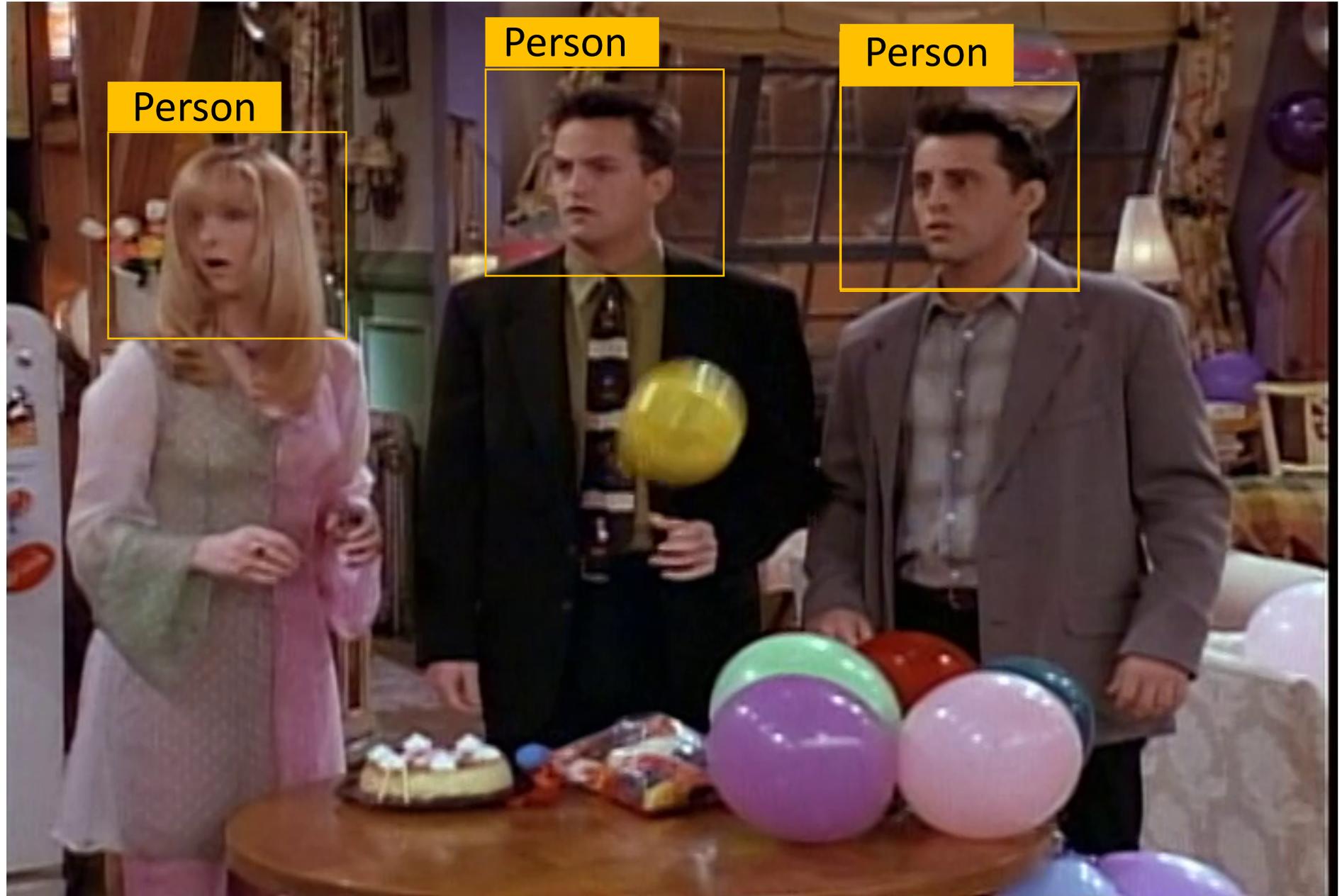


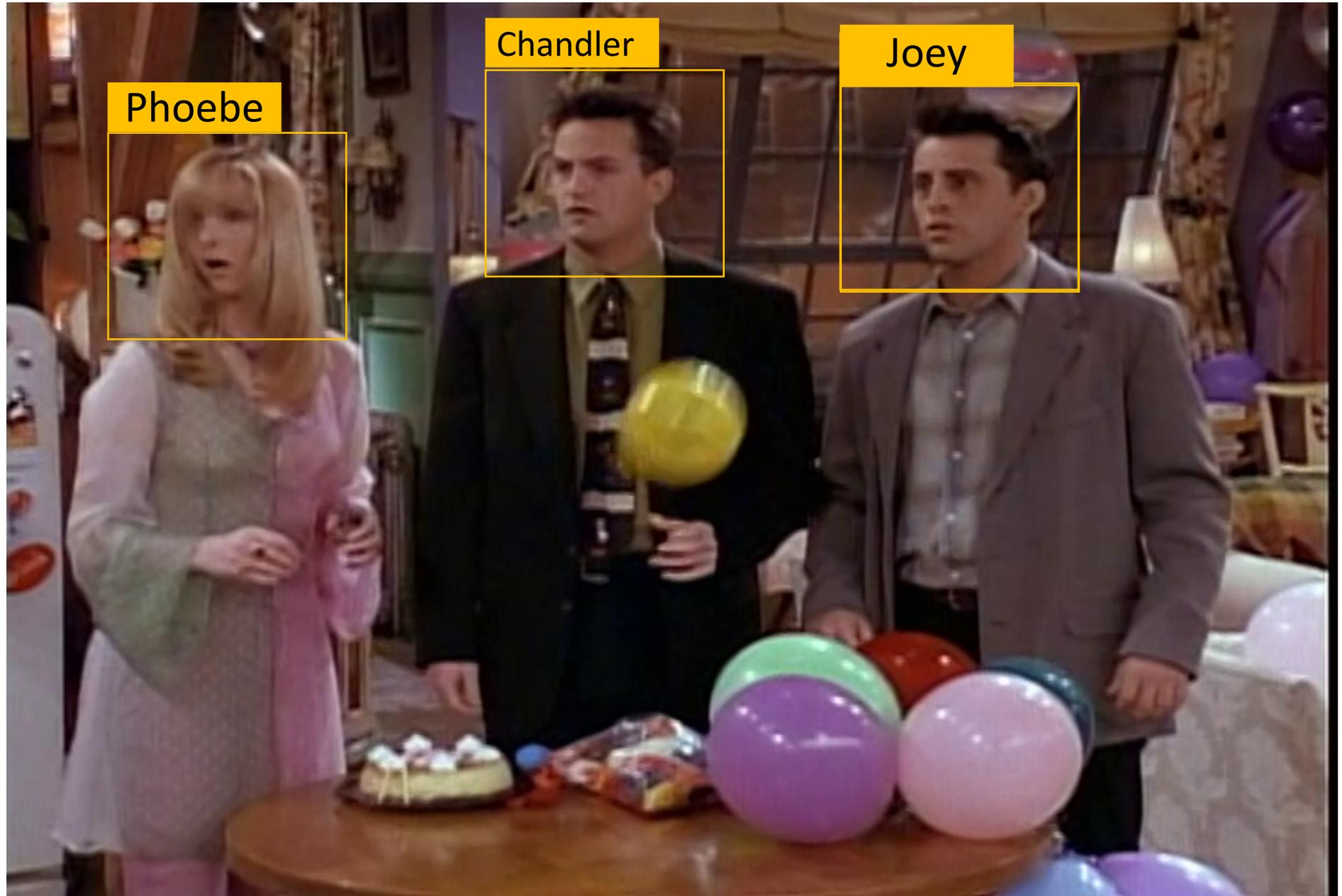
Proportion of time for which each character is shown in a close up shot as a ratio of the total time they are present in the show. Error bars with 95% confidence intervals for the mean of each group.

F·R·I·E·N·D·S









Phoebe

Chandler

Joey



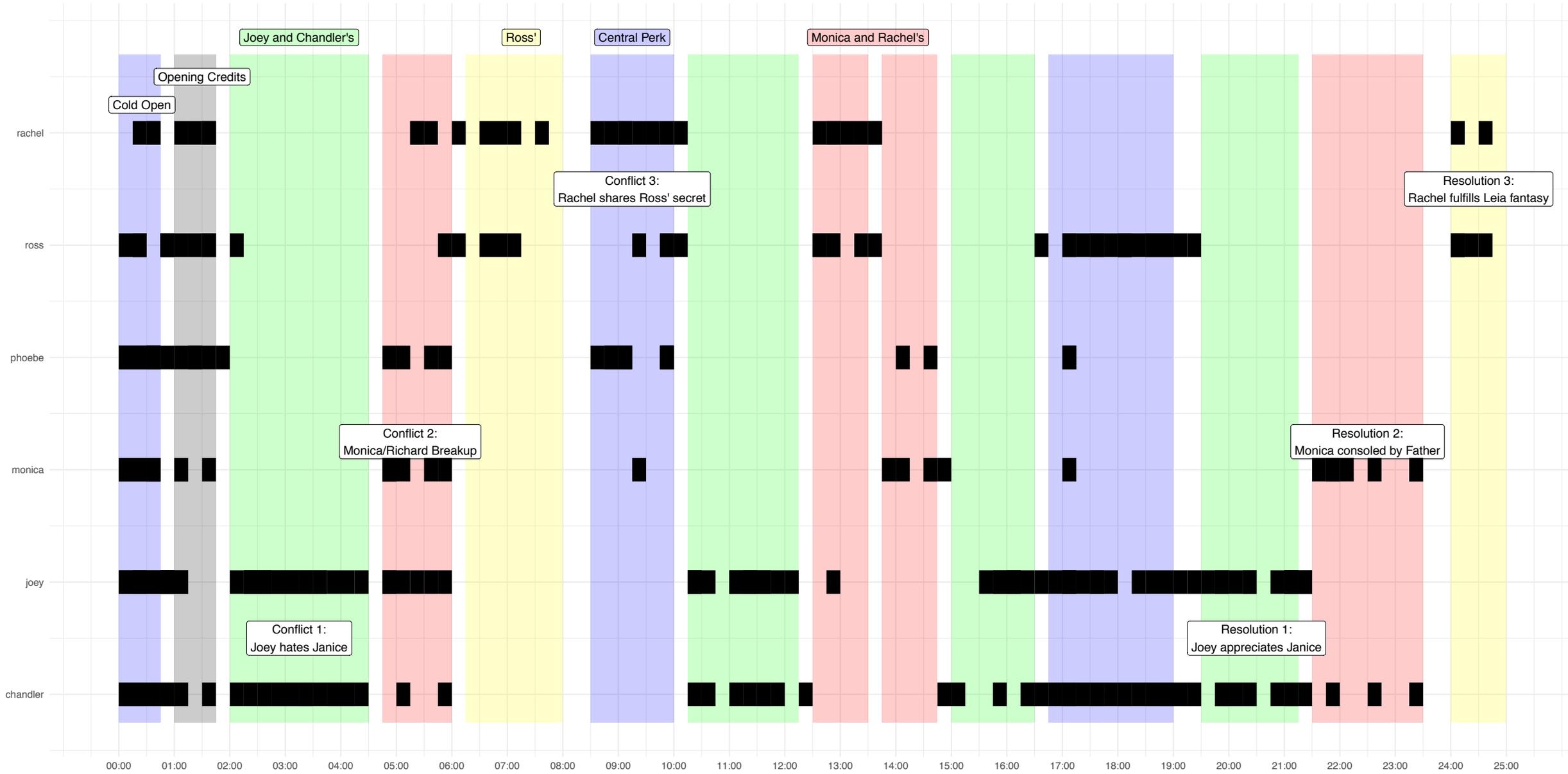


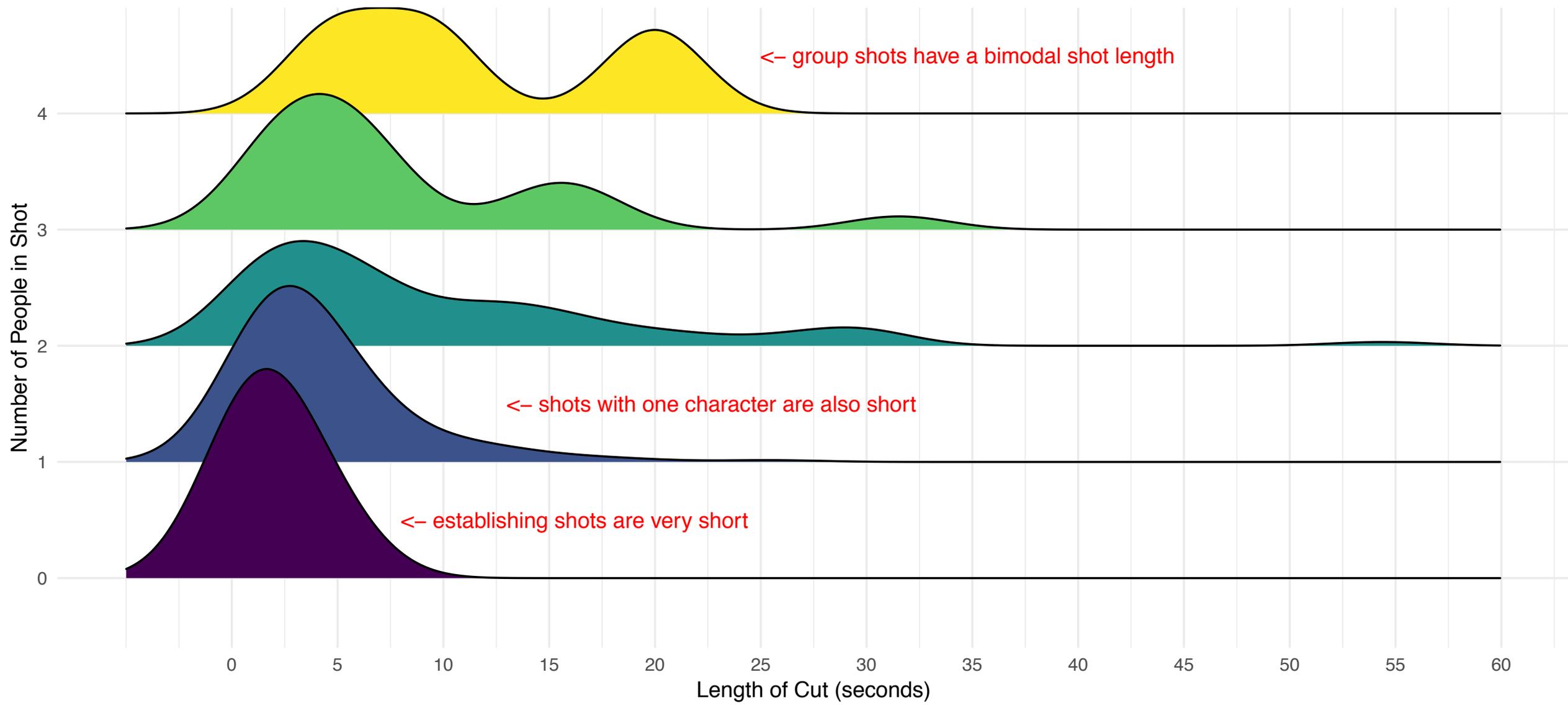
# BIRTHDAY PARTY



Cake

Balloon





Cluster 2



Cluster 3



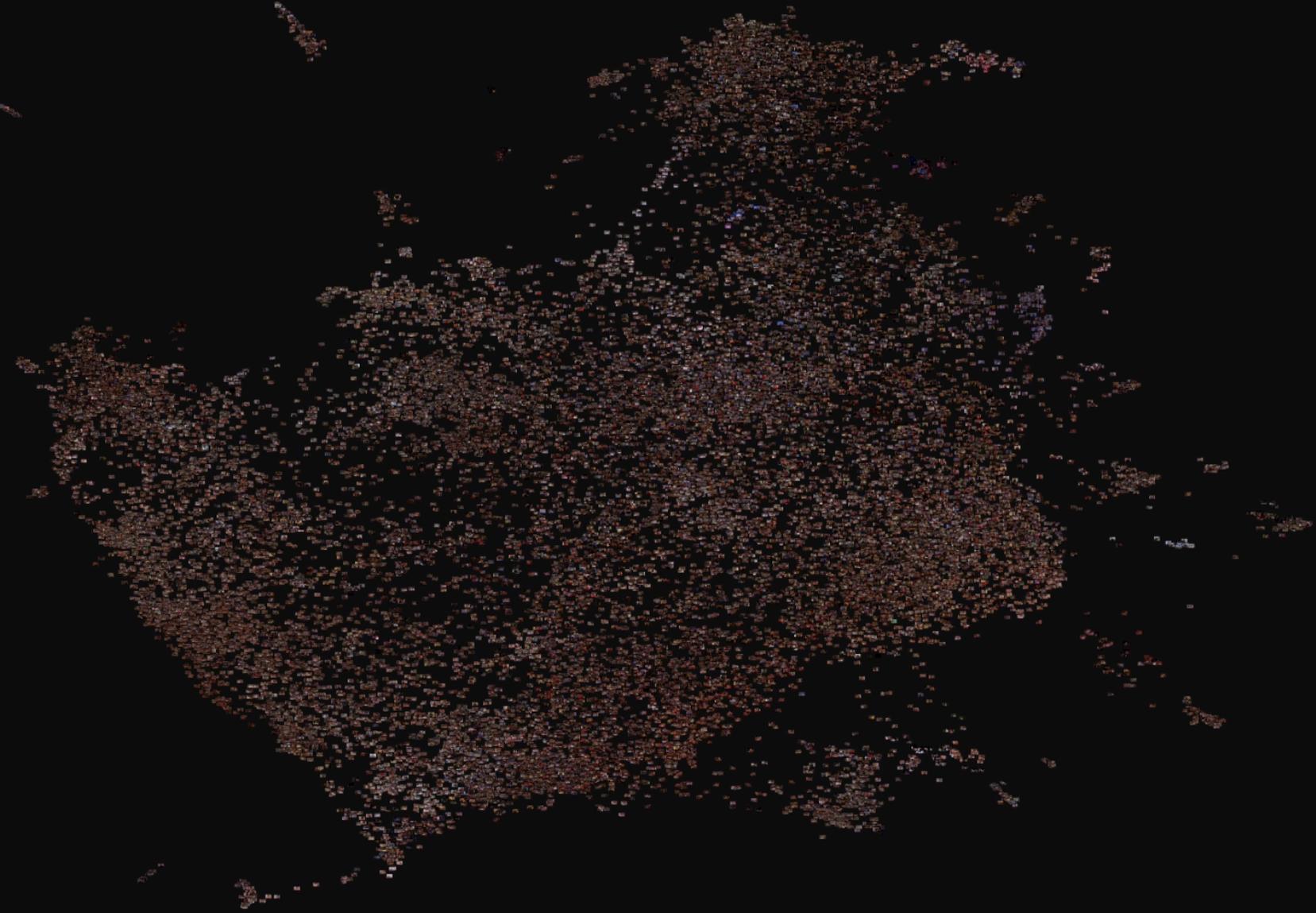
Cluster 4



Cluster 5



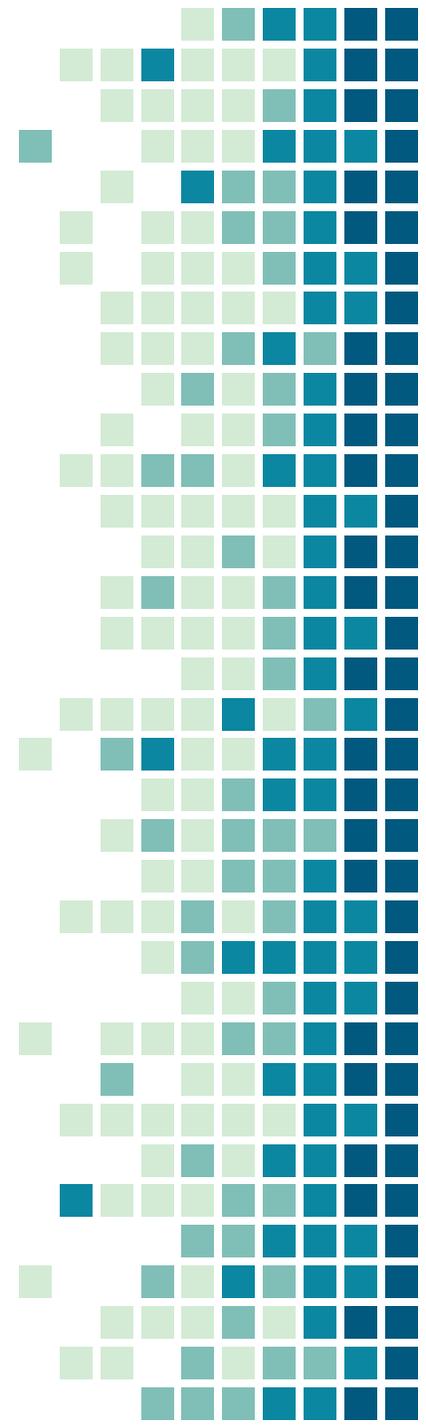
Cluster 6



# Distant Viewing

- method and theory for analyzing images at large scale
- make explicit the interpretive nature of extracting semantic metadata from images
- must "view" visual materials in order to study at scale
  - assign a semantic meaning to an array of pixels construct a representation of elements contained within visual material: a code system in semiotics, or, similarly, a metadata schema in informatics
  - design and apply algorithms/models capable of converting raw images into the established representation
- use exploratory data analysis to aggregate and visualize the automatic extraction of semantic elements

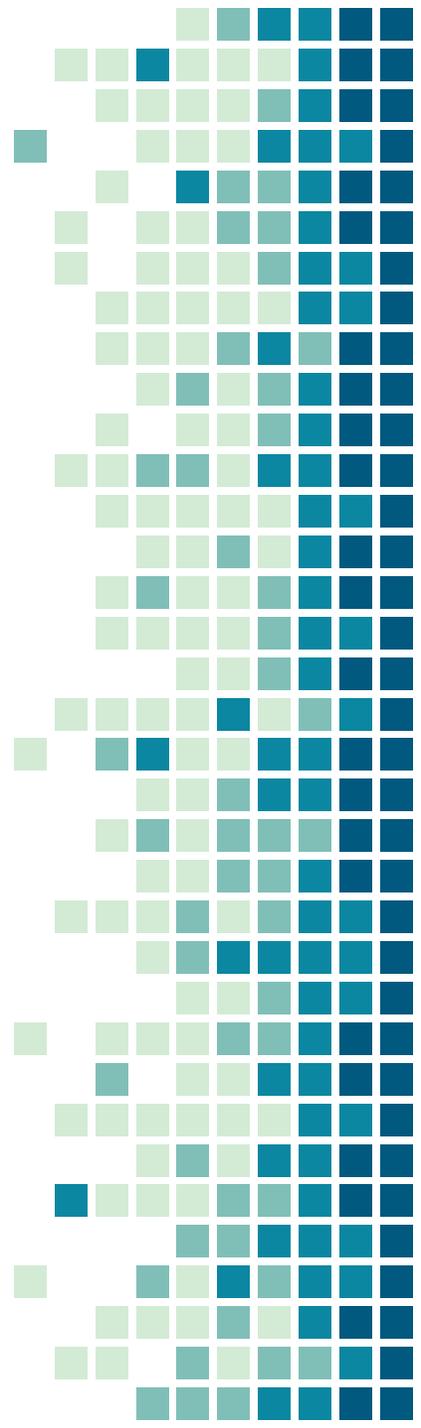
Article: Arnold and Tilton. "Distant Viewing."  
*Digital Scholarship in the Humanities*. March 2019.



# Distant Viewing Toolkit

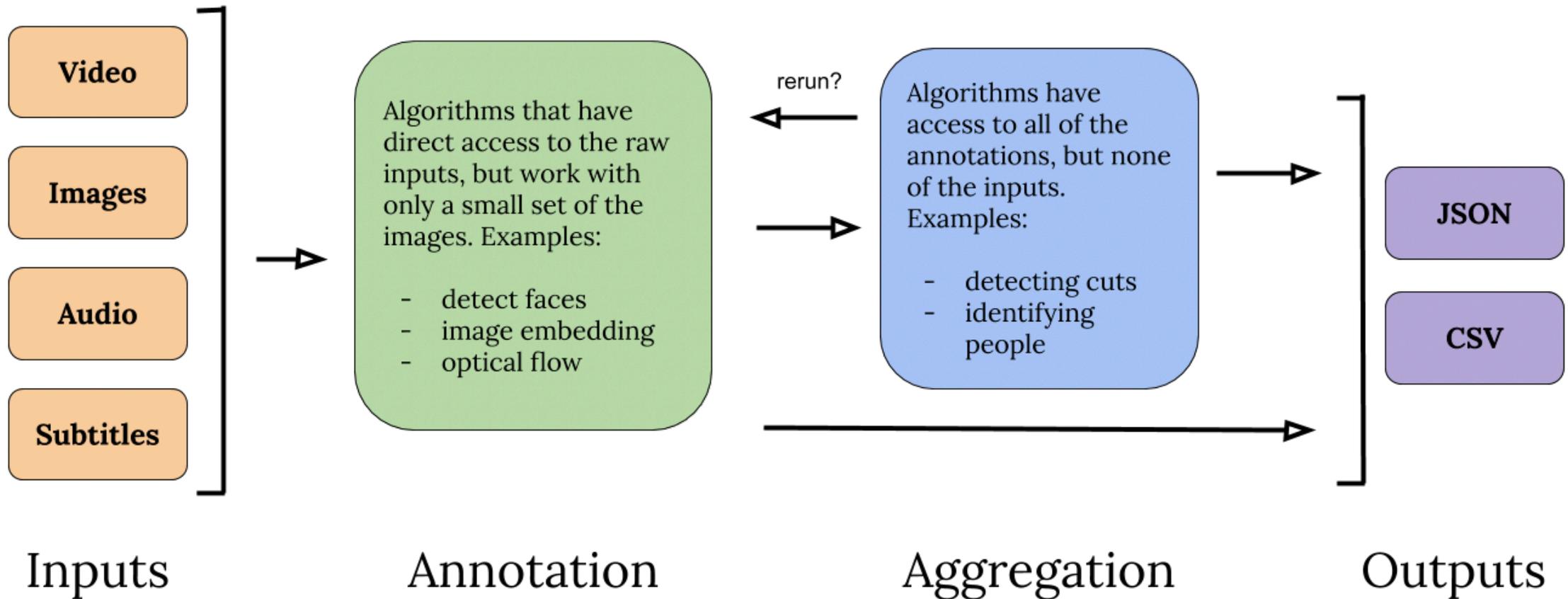


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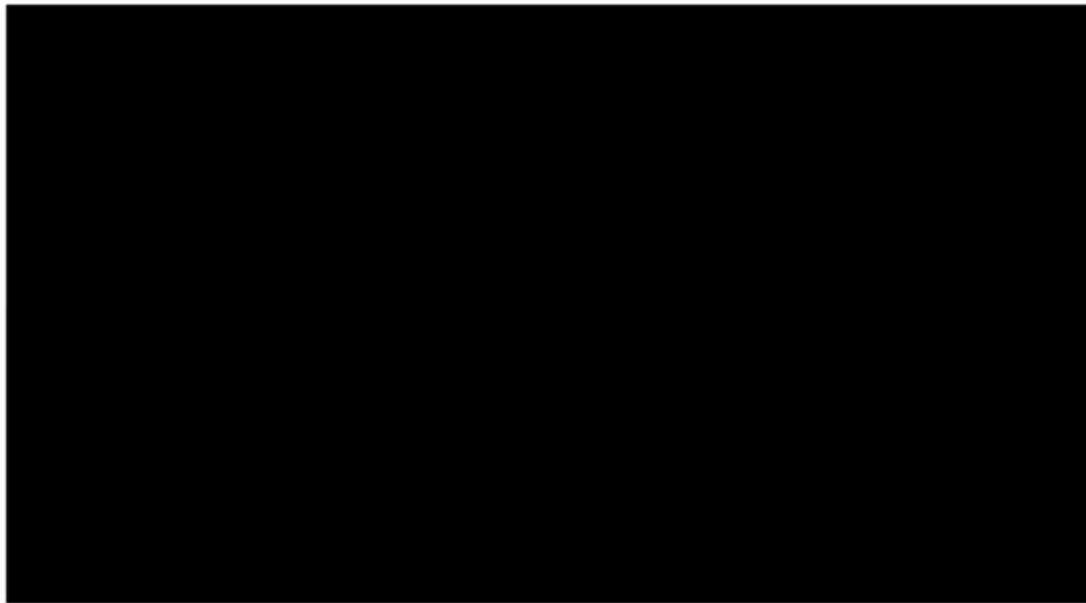
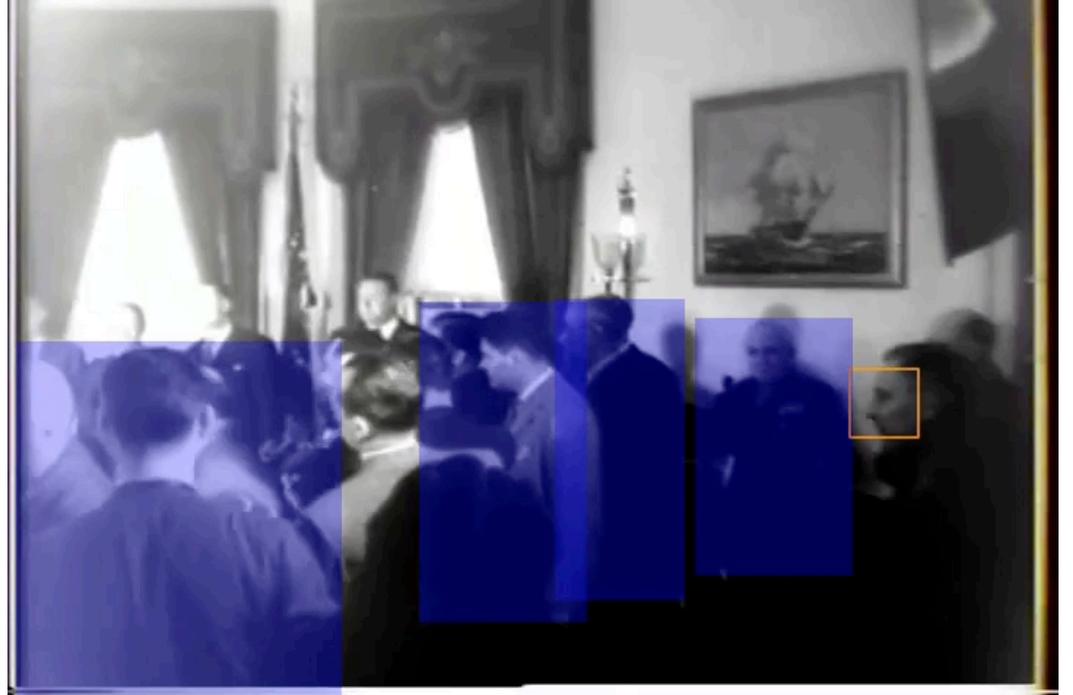
- Makes use of **existing models** for low-level features such as individual faces and object detection.
- Develops **new ontologies**, inflected by humanities scholarship, and **new models** for predicting features from media.

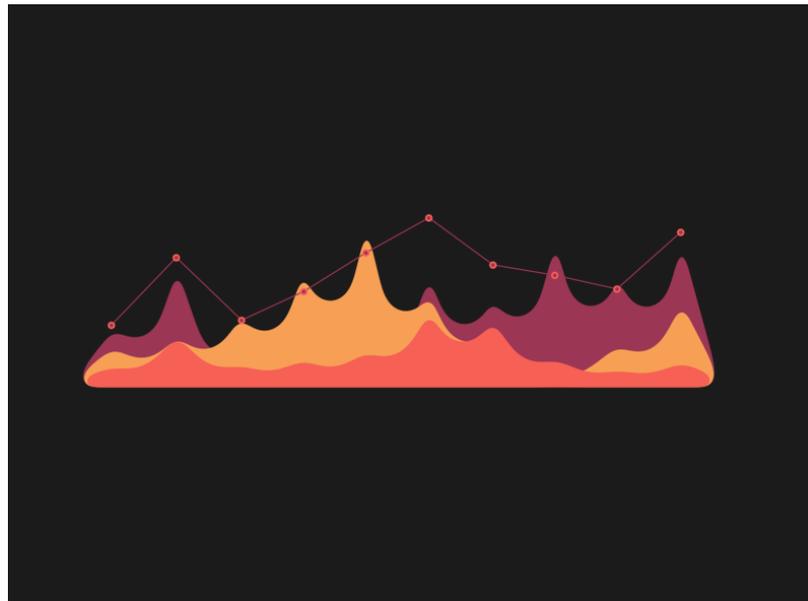
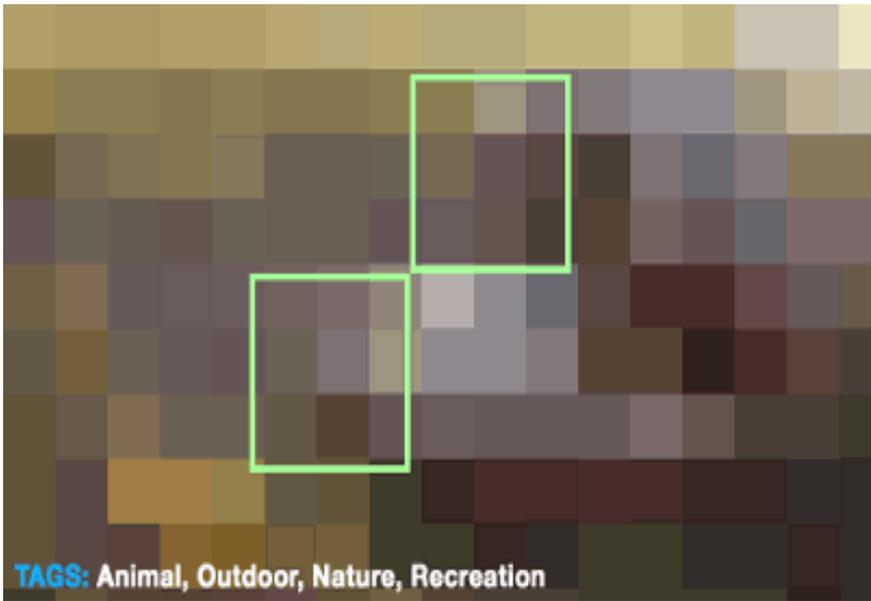
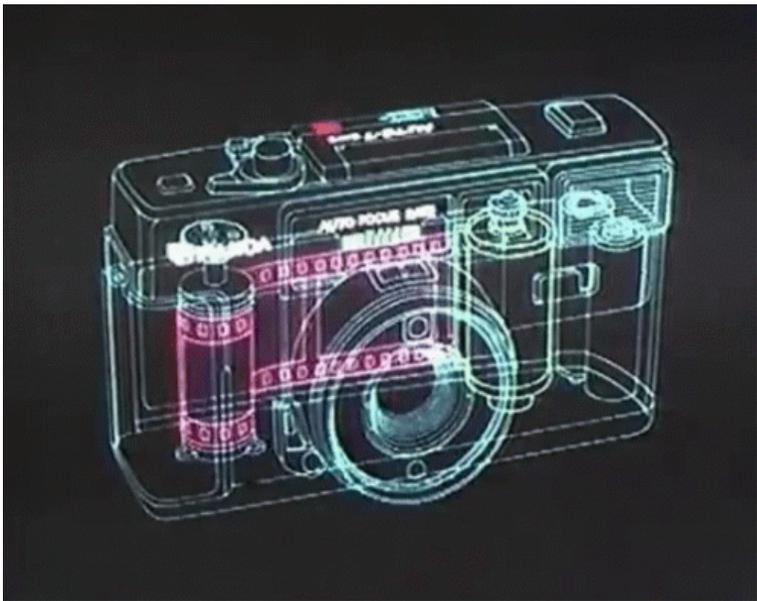
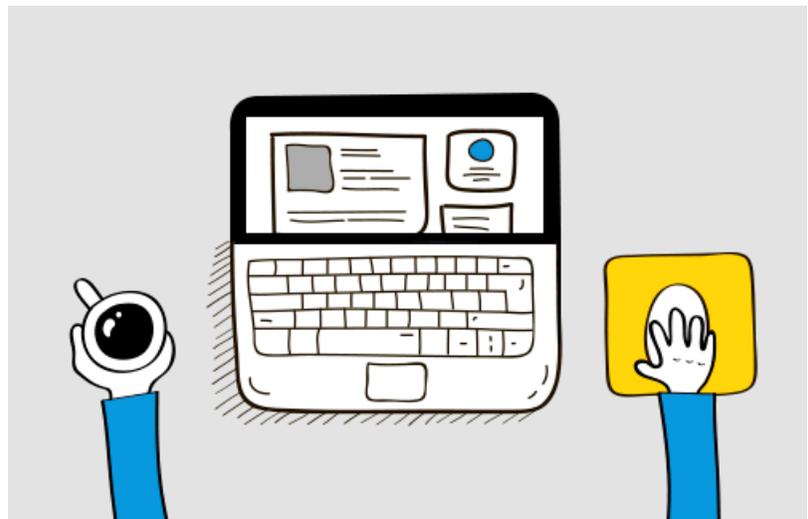
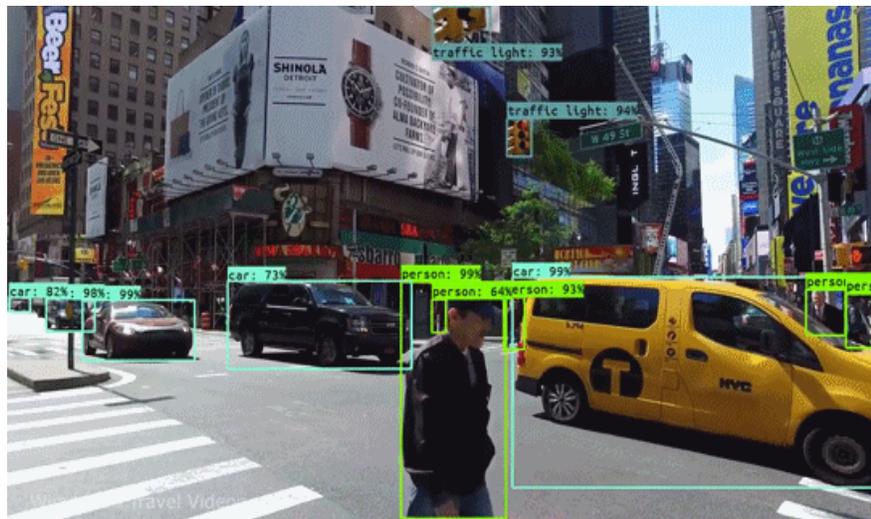
Article: Arnold and Tilton. "Distant Viewing." *Digital Scholarship in the Humanities*. March 2019.



Schematic of the Distant Viewing Toolkit's internal architecture. Algorithms are split into two types: annotators that have access to small chunks of the raw inputs and aggregators that have access to all of the extracted annotations but not the input data itself.

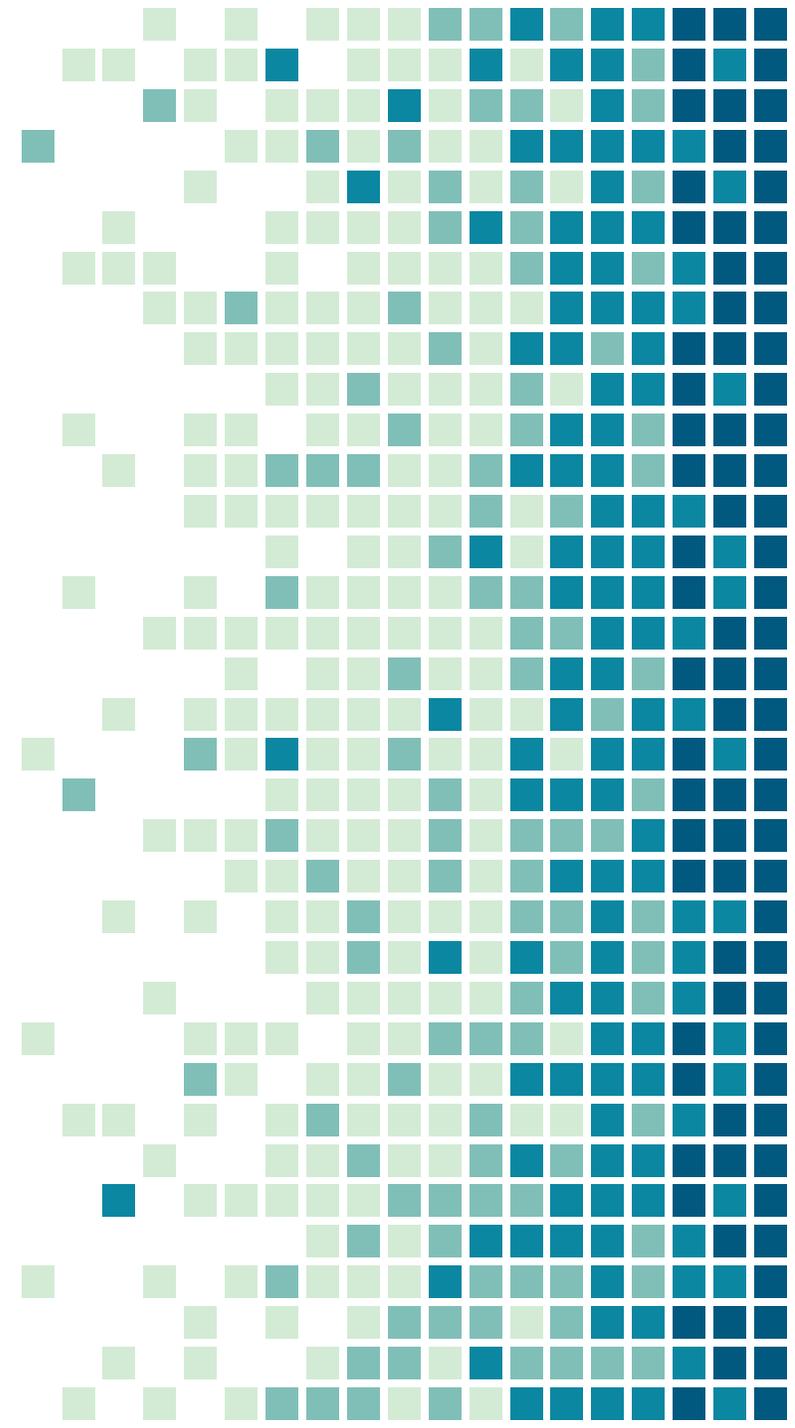


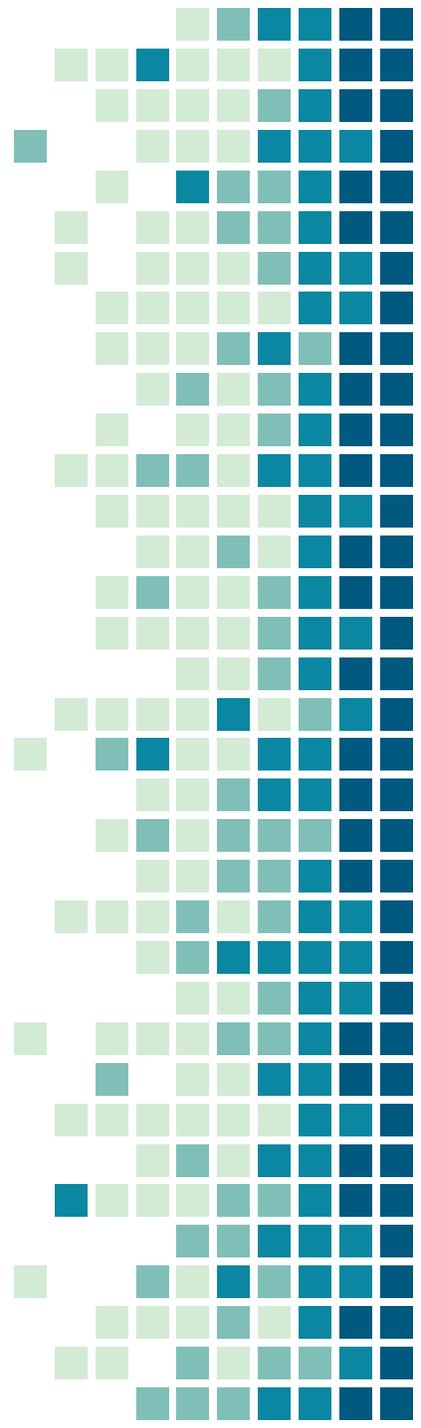
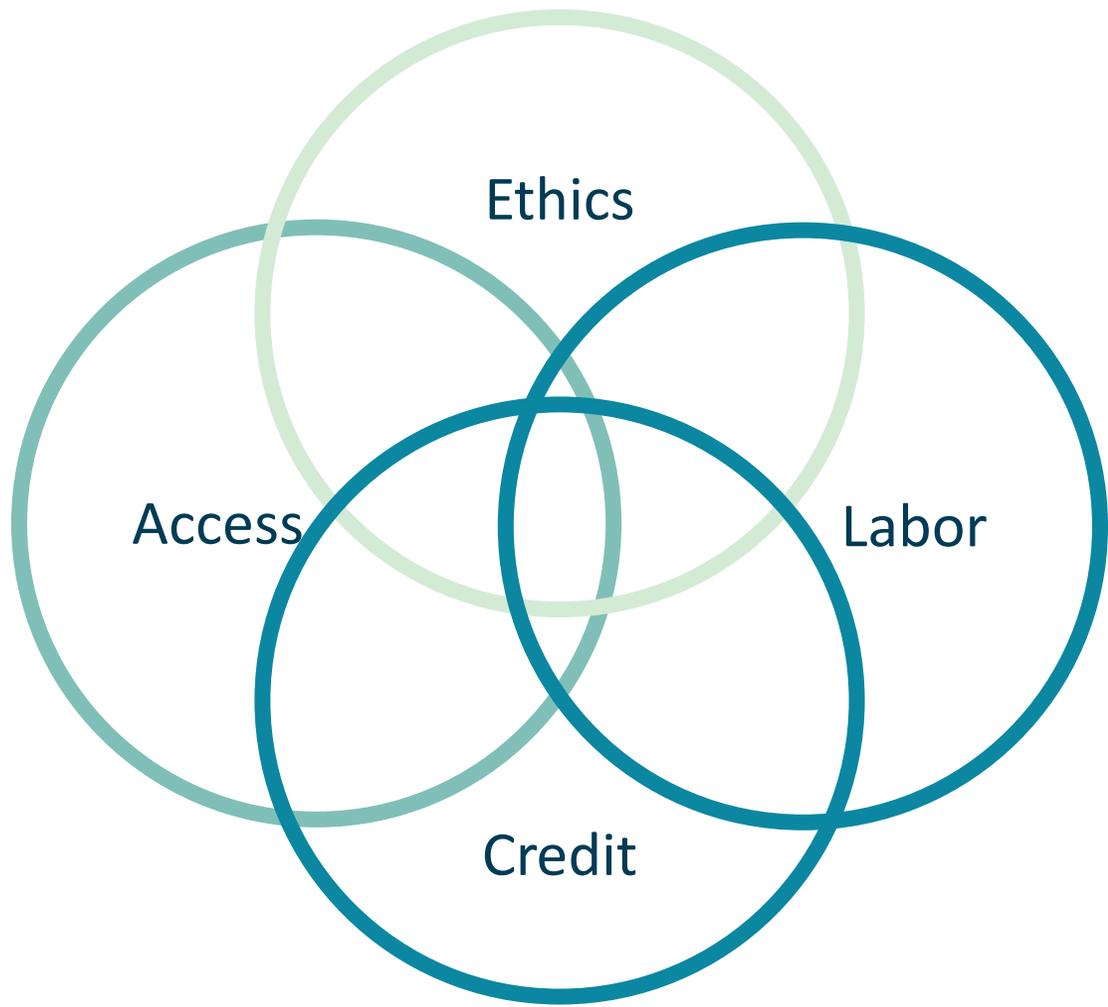




# 4. Challenges

Let's start with the first set of slides







# Thank you.

Lauren Tilton | @nolauren

Distant Viewing Lab  
@distantviewing #distantviewing  
University of Richmond

