Filipa Calado
Profs. Maura Smale and Luke Waltzer
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Project Proposal: Digital Annotation

This proposal explores digital annotation as a way to make solitary reading practices more embodied and engaging. I intend to modify an existing annotation tool to use in my English 220: Introduction to Writing about Literature course at Hunter College. As an instructor for this course, I learned the difficulty of teaching active reading skills in the classroom. By "active reading", I mean strategies that allow one to not only understand the ideas in a text, but to engage critically with them. Often, active reading denotes a variety of actions, such as highlighting, underlining, and writing in the margin, to emphasize moments of interest that require close attention. These strategies assist the reader to identify and focus on concrete elements of the text and guide her in constructing a critical response. However, as any English instructor of lower-level undergraduate classes knows, these strategies do not come naturally to most readers, and they have to be cultivated through repeated modeling and practice in the classroom. Instructors must make visible the attention to language—specific sentences, phrases and words—required in close reading, and demonstrate how to analyze language in depth, particularly the elaboration of meaning or significance. From my experience, I've found that using a digital annotation tool in the classroom is immensely helpful for modeling "active reading" strategies for students and following their progress as they complete the reading. By annotating passages as a class, I can guide them toward making incisive and thoughtful responses; and by having them annotate the text as homework, I am able to see what my students

are thinking about, how they incorporated their knowledge of figurative language that we learned in class, and how they work towards making critical arguments about their reading.

While this tool has been immensely helpful for teaching close and critical attention to language, I recently find myself more interested in accessing and harnessing other kinds of responses to reading. For this project, I will explore how this sense of "active reading" can be expanded to include *affect* in order to engage nonverbal and embodied responses to text. As Sharona Levy points out, it is very difficult to understand how students process a text: "there is no mechanism to open their heads and see which neurons are firing while they are reading" (5). Traditional annotation only engages critical activity in its textual, verbalized form. Therefore, I propose to apply digital annotation toward engaging nonverbal reactions to reading. While the current tool allows me to make visible the role of analysis and interpretation, and to follow my students' progress in learning close reading, it doesn't address the emotional and instinctual reactions that often occur in reading. An additional feature, specifically, the option for color-coding the annotations, would allow students to confront their more immediate responses, feelings, and gut reactions during the reading process. By customizing the color of their highlights, students may begin to understand how their feelings can be part of a larger, more formalized analytical process. With more options, students can identify moments of interest, confusion, or other affects as moments that deserve further scrutiny. Additionally, they can also use colors as flexible categories that indicate different areas of understanding---such as figuration, themes, or syntax. In this way, the tool will not only engage affect and bodily reactions, but also allow for organizing and categorizing different types of annotations.

This color-coding feature aims to resist the pervasive and insidious nature of many "edtech" tools and platforms, especially those that quantify or "measure" student learning. The effects of edtech range from exploitative to harmful, as Audrey Watters explains in her extensive investigations on dangers of collecting information on students, which not only makes them vulnerable to those who would profit from them economically, but also reduces them data points and labels, such as "cheat" or "at risk". In "Ed-Tech and Trump", Watters explains that the desire to track and collect student data is closely associated with the desire to harm certain demographics, as was the case with the first computational census that began in Nazi Germany. More recently, in a talk at the Graduate Center, Watters discusses how certain edtech tools that track student performance---and purport to create "personalized" learning experiences---actually work to standardize and automate education. Keeping these conversations in mind, I'm interested in creating a tool that resists this trend of quantification. Therefore, by experimenting with nonverbal, embodied reactions to reading, I hope to achieve two things: first, as stated above, I hope to examine the role of affect in critical thinking, and second, I hope to explore how "tracking" can serve ends that are not exploitative, but provocative and empowering. Through this tool, I will experiment with active reading and assessment that engages moments of emotional struggle and insight, rather than measurable "learning outcomes".

This annotation tool will build off of the codebase for the Hypothes.is project, and will be integrated into a WordPress website. Before describing how my version of the tool would look, I'm going to give a basic explanation of how Hypothes.is functions. Hypothes.is is an open source annotation tool that operates as a browser extension, which means that it can be activated and used on any page that appears on a web browser. To use Hypothes.is, the user must first

create an account on the Hypothes.is homepage. Then, they have to download a browser extension and activate it. After activating the browser extension and logging into the account, they are able to make annotations. To make an annotation, users highlight the desired text and type their comment in a simple text box that appears. After saving their comment, the original text is highlighted, and all users may view the annotation on a collapsible sidebar. By selecting the "reply" button, users then can respond to the comment, which will appear below the previous annotation on the sidebar. My proposal would modify the appearance of the highligther by offering options for highlighter colors. Rather than just have yellow, users can choose among a variety of colors to highlight the text. As an open-source project, with extensive documentation and a supportive developer community, Hypothes.is, will be the base for developing my customizations.

In developing the tool, I wonder how annotation might expand or reduce the quality of the student's engagement with the text. Here, I'm concerned in the tension between what I call the "provocative"---opening up the text to new insights---and the "prescriptive"---limiting a student's interaction with the text to a predetermined set of choices or options for responding. In exploring this tension, I have three main questions: First, how do annotation tools support a prescriptive approach to teaching close reading: how do they create a standardized method or process in responding to texts? Second, more specifically, do certain features, such as colors, categories, or tags, for example, actually limit the kinds of responses they could have without these prompts? Do these options actually create a confining structure? And finally, from the opposite perspective, how can giving students more nonverbal options in an annotation tool provoke them toward more spontaneous insights?

In answering these questions, I am influenced by the work of N. Katherine Hayles, John Bean, and Amelia Abeau. These theorists' work, which range across the subjects of cybernetics, college composition, and theories of the quantified self, situates my thinking on the role of affect in technology and in writing. Hayles, in *How We Became Posthuman* has been a continued influence in how I think through human interaction with machines, particularly on the tension between embodied and disembodied knowledge. Hayles' book examines the question, "How we became posthuman" by examining "how information lost it's body" (2). By this phrase, Hayles means the idea, descendant from eighteenth century liberal humanism, that knowledge and feelings can exist independently of the body. She examines philosophical trends that prioritize rationality in the human, and extend into conceptions of the posthuman, which imagines the body as a prosthesis of the mind. In thinking about Hayles' work, I'm specifically interested in how annotation engages with reading as an *embodied practice* that engages with extra-textual meaning. In other words, how can annotation connect more directly to knowledge as feeling and affect, rather than knowledge as information that exists purely in a textual form?

John Bean's work also influences how I approach affect as part of an analytical process. Bean's book, *Engaging Ideas*, explores how college composition and rhetoric instructors can use writing as a method to teach critical thinking skills in the classroom. Bean argues that the act of writing is implicitly analytical and evaluative, rather than communicative. He suggests instructors organize their lessons around "problems", specifically, "beautiful problems… [which] create natural critical learning environments" (3). He explains that good writing assignments provoke a kind of productive discomfort, and that academic writing ought to capitalize on this "intellectual and often emotional struggle" (23). According to Bean, this struggle emerges with

the awareness that a problem exists, which students must attempt to resolve. I'm interested in exploring how "beautiful problems" create moments of insight and spontaneous response. Throughout his work, I'm most influenced by power that "wonder", "discomfort" and "struggle" have in stimulating thinking. But unlike Bean, I dwell on the power of these affects prior to their verbalization in traditional composition practices.

Amelia Abreu is also interested in dwelling in affects that cannot be verbalized. Her essay, "Quantify Everything: A Dream of Feminist Data Future", explores the "Quantified Self movement", which aims to track and measure daily activities, such as exercise and work. She explains the main purpose behind these practices:

> Much of the promise of the Quantified Self movement is in the discovery and adoption of near-perfect, near-universal metrics. If we can develop the perfect measurement for an object and its functions, nothing can be out of order, and we all can achieve a sort of equal footing. This is a dangerous line of thinking, and one that's been problematized since Rousseau.

Abreu's article argues that emotional labor, such as caregiving, cannot be quantified like other types of labor. Given that such labor is characterized by emotional toil, she doubts that one can adequately "sense caregiving". Like Watters, Abreu is wary the capitalist aims that drive quantification. She wonders if quantification can be deployed with care and social awareness: "Rather than seeking to perfect measures and standards of that work through statistical working-over, can we envision workers taking their own data to management to improve working conditions?" In the same vein, I also hope to use annotation technology in thoughtful ways, that resist fulfilling reductive "learning outcomes". Technology that engages emotion and

affect creates an opportunity for new means of tracking and assessment. Much like Abreu, “I wonder if we can ever reach a point where sensor technology and data-mining can be accessible and successful, flexible enough to be genuinely empowering, allowing users to control their own narratives.”

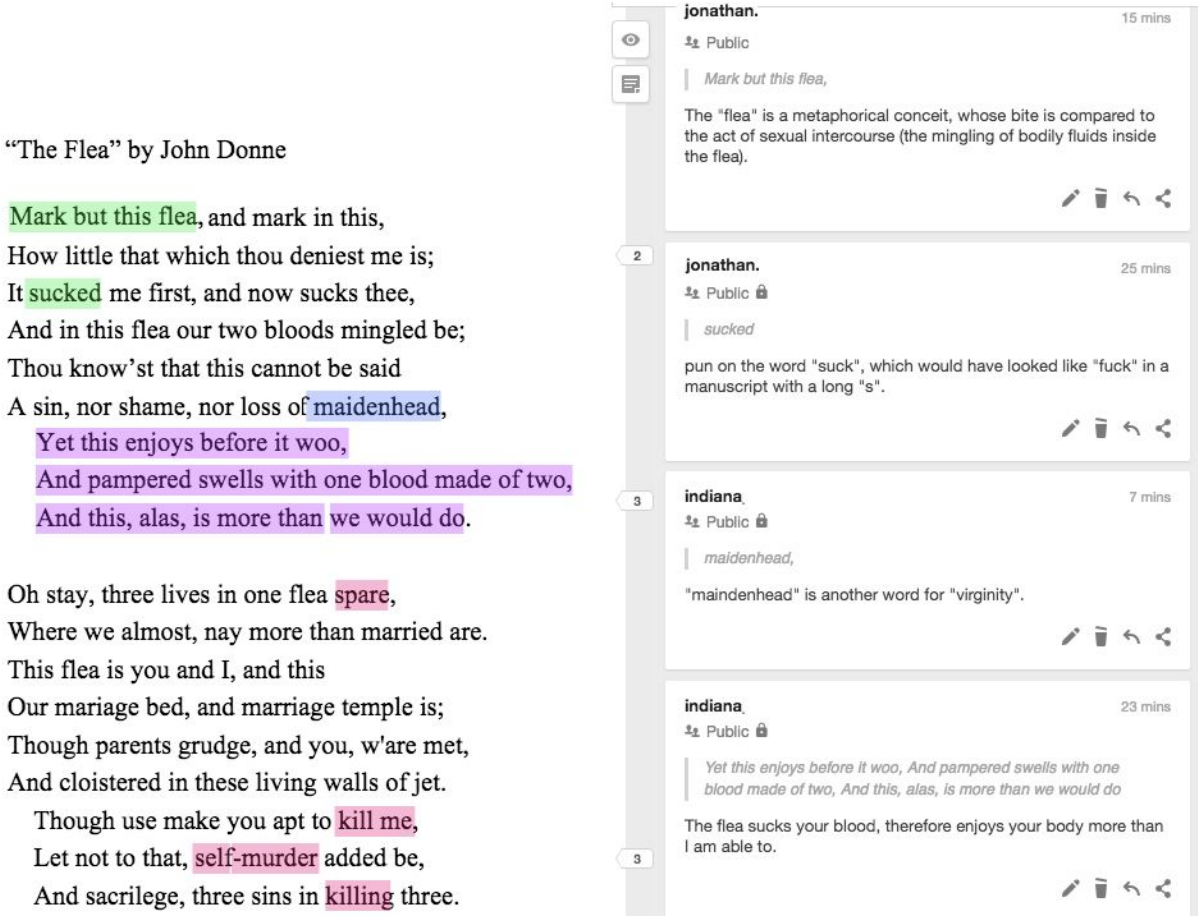
These tensions between quantification and care, writing and feeling, and embodied and disembodied knowledge play out in several recent annotation projects. The project most relevant to my proposal is a tool called “Ponder”, created by a private tech company, Parlor Labs, Inc. Like Hypothes.is, Ponder is a browser add-on tool that can be activated on any webpage. The company describes it as a “micro-response tool”, that purports to “give teachers a view into the ‘invisible’ process of learning through higher-order critical thinking” (“About”). The tool shares a basic functionality with Hypothes.is, which is highlighting text and responding through a written annotation. But has some additional features, including options for different “reactions”, called “sentiment tags”, and options for choosing from a list of “themes”, compiled and customized by the teacher. The “sentiment tags” are particularly interesting, because they allow students to categorize and color-code their responses according to “clarification”, “analysis” or “emotion”. Unfortunately, the project is proprietary, and charges a fee for its full usage.

Another example of digital annotation comes from a project called “Lacuna Stories”, developed by the Poetic Media Lab at Stanford University, where it is incorporated as a Learning Management System. One major difference with Lacuna Stories its use as a platform, rather than a tool, for social reading and writing. Lacuna Stories is meant to be used by schools as a central organizing space for a course, like Blackboard or Canvas and provides a reading and writing interface for engaging with course materials. That being said, the annotation component here

functions similarly to Ponder: the reader highlights a section of the text, and has the option of making a comment. Then, the reader will be prompted by options for different types of responses. Like Ponder, there are four categories, which are also color-coded: “Comment”, “Question”, “Analyze”, “Connect”. However, unlike Ponder, Lacuna Stories contains a tracking mechanism for teachers to follow their students’ progress as they complete the homework and make annotations. On the “Annotations Dashboard”, which is only visible to the course instructor, student data such as the number of annotations, length of annotation, and private/public status of annotations is visible to the teacher in a series of graphs and charts. In the section, “Filter by Time”, instructors can view the raw number of annotations made on any given day of the course, which can be useful to get an overall sense of daily participation. In “Annotation Details”, a series of pie charts indicate the relative amount of annotations by category (“comment”, “question”, “analyze”, connect), the length for each annotation, and the ratio of shared to private. Here, I wonder at the purpose of tracking the length of each annotation, and how such metrics might prioritize quantity as an assessment criterion. Finally, the “Network” section connects students to the texts they have annotated, with the links between them weighted (thickened) according to the amount of annotations each student made on each text. This section allows instructors to see how many annotations each text received by each students. As a review of Lacuna Stories in *The Journal of Interactive Technology and Pedagogy* notes, “social annotations can serve as an accountability mechanism for completing assigned reading in a timely fashion, because instructors will see students’ activity on the text and students will know that instructors can see this activity.” This feature of the dashboard allows teachers to track the quantity, rather than the quality, of student annotations. For this reason, it promotes

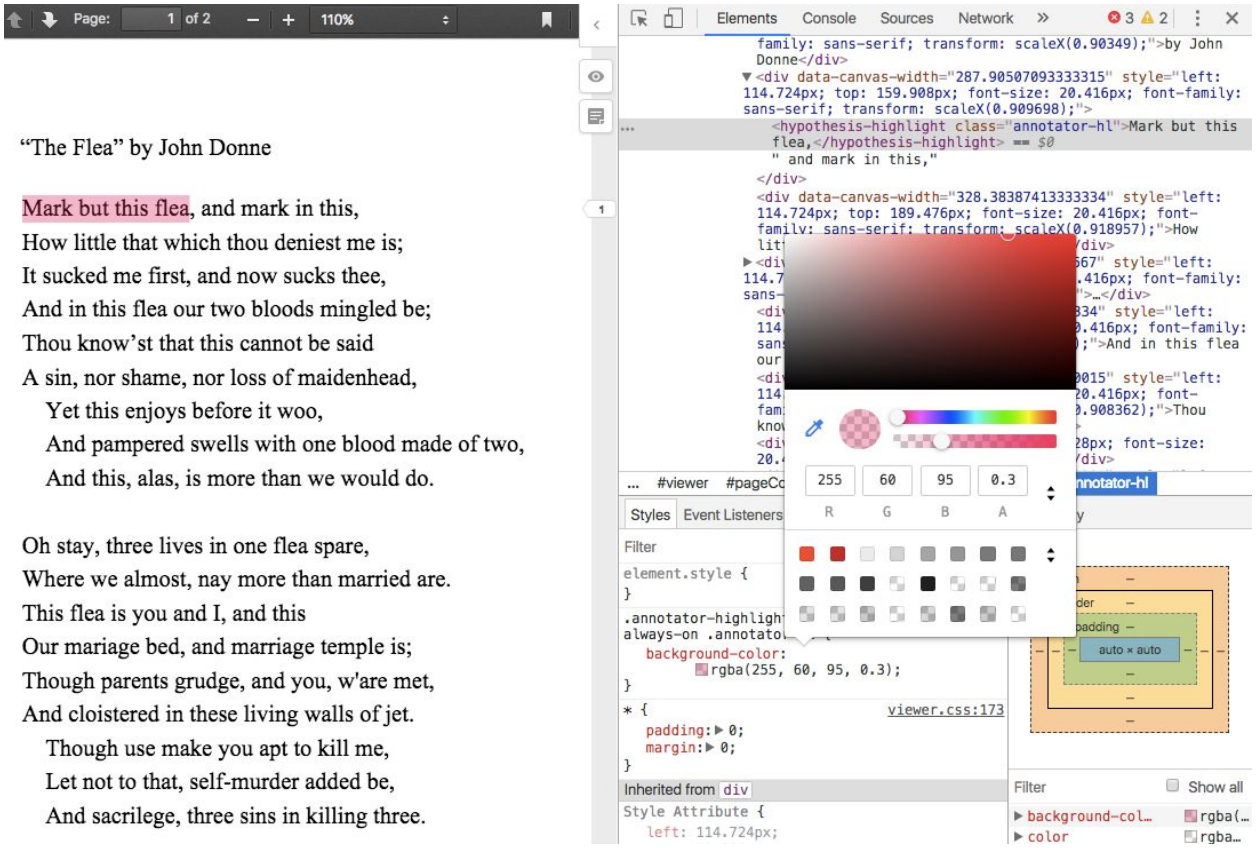
what Watters and Abreu describe as the reductive effects of certain edtech tools. There is another platform, Annotation Studio, that also follows and analyzes a student's progress through the text through visualization methods. Again, at what point does the implementation of these tools actually reduce or flatten the critical interventions that they are supposed to inspire?

Shifting away from these examples, I now turn to my proposal, and discuss my plans for completing the project. First, I will present how the tool ought to appear in its final form. The below screenshot shows how my ideal version of the tool would look in a web browser. This mock-up is based on the appearance and function of Hypothes.is, and it includes the additional multi-color highlight feature. Here, one can see the source text, a poem by John Donne, and the annotations in the sidebar to the right. On the poem, the annotations are highlighted in different colors, which convey information about the type of annotation. For example, the annotations in green indicate literary devices (here, a metaphor and a pun); the annotation in blue indicates comprehension (here, modernizes an anachronism); the one in purple paraphrases a syntactically challenging section of the poem; and the annotations in red, in the second stanza, indicate imagery of violence, showing how the tool might engage affect. As these examples show, the multi-color functionality can denote a variety of responses, from ones that follow the teacher's instructions to the reader's own subjective response. One of the challenges in developing the tool will be to think through the affordances of using color in pre-defined ways and using it more spontaneously. As stated above, I'm particularly interested how annotation practice can both limit and open up critical interventions. Therefore, while I'm building the tool, I will consider how a scaffolded annotation structure can become constraining, as well as how such constraints can be enabling.



In order to complete this project, I will need to go into the Hypothes.is code and alter the CSS files to include an option of multiple colors in the highlighter. The image below shows where the relevant element resides in the Hypothes.is code. Here, I used the Developer Tools console (in a Google Chrome browser) to isolate the relevant element. I found the element by clicking on the highlighted text. The relevant section in the body of the page, in the HTML, appears on the upper-right-hand side of the console. The relevant section in the CSS file appears in the lower-left-hand side of the console. After isolating the element, I changed the color of the highlight by altering the hexidemical code (which defines colors) in the CSS file. Using the

developer tools, I was able to change this color temporarily, which is visible in the image, from yellow to red. It is important to note here that changes are not permanent---using the console is like editing a "live" version of the site, and all changes will revert to their default setting after refreshing or closing the tab. The purpose of this exercise, then, is to get a view of the code structure and display the section of code that is relevant to my project.



To build this tool, I will have to further familiarize myself with the existing codebase for Hypothes.is, and be comfortable enough with several coding languages to make changes. Though I have implemented both Hypothes.is and Annotator.js (Hypothes.is's parent project) in my past teaching and research, I have never built or customized anything with this level of

complexity, and I've certainly never written code from scratch. From browsing the Hypothes.is documentation and Github repositories, I sense that I would need proficiency in HTML, CSS, Javascript, Python, and WordPress.org. To date, I feel comfortable enough with HTML and have a working knowledge of CSS, Javascript and Python. And I have previously developed websites with WordPress.com and Drupal, though I have never worked with WordPress.org. This is all to say that---at this point---I anticipate that I would need to focus on strengthening my CSS, Javascript, Python, and familiarity with WordPress.org, before getting started. I also anticipate that much of my preparation will be spent researching other annotation tools, and familiarizing myself with relevant resources, for example, the "Annotation Tools" website by previous ITP student, Anke Geertsma.

The entire process will take somewhere between 3-6 months, with 1-2 months spent on research and 2-4 months on building and testing. I plan to complete the research phase of my project this summer, when I will have enough time to familiarize myself with Wordpress.org, CSS, Javascript and Python, as well as the Hypothes.is libraries. During this time, I will also examine the Github libraries of Lacuna Stories, Annotator.js, and Annotation Studio (all open source annotation projects that use multi-colored highlighting) as potential models for writing my CSS. In the fall semester, I will build and test the tool, hopefully under the guidance of Chris Stein or Michael Mandiberg, who have programming experience. Here, I will employ a workflow that accords with Agile methodologies, which pursues the project step by step, assuming that things will change. At bare minimum, I hope to create a multi-color option for highlighting. In the case that I complete this functionality before the end of the semester, I will then scale up my goals to include more interactive and engaging features. Then, I would

prioritize my features in the following order: (1) color-coding options; (2) tagging options (for emotional/analytical reactions); and (3) interactive functionalities ("liking" or "voting" options). If any of these things prove too difficult to accomplish, I will then scale back the technical aspects of the project and turn to creating supplementary teaching materials about using annotation for close-reading instruction.

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