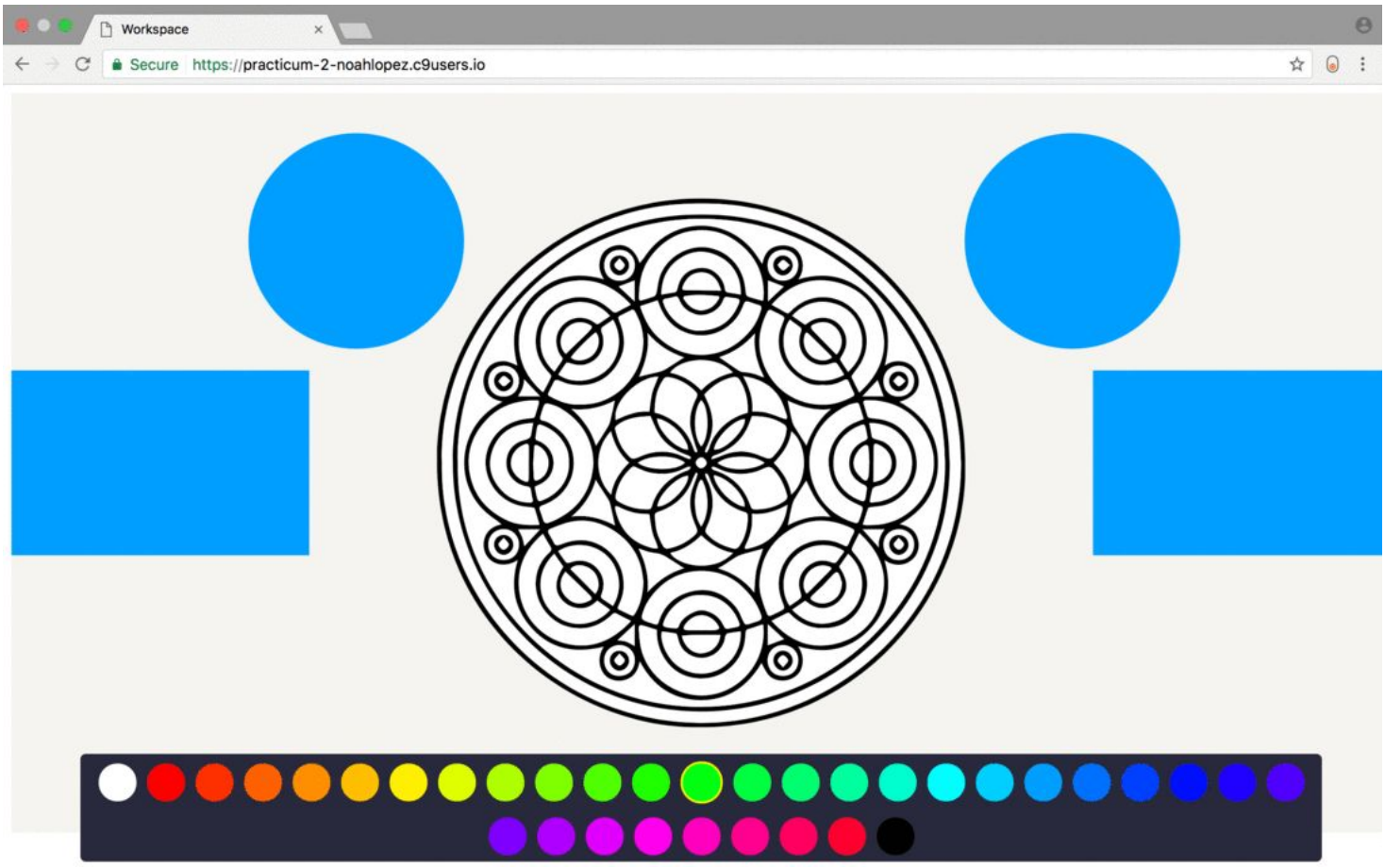
Region Color Design Report



Region Color - A simple and efficient way for a user to color a multitude of regions with a single swipe of the finger

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Interaction Description

In the Region color interaction a user begins by selecting a color they would like to fill regions in with. They then hold and drag the finger across regions they would like to select. (Note: a red arrow will follow their finger and selected regions are highlighted). In the last step the user simply lifts their finger up and the regions will fill in with the color they selected.

Design Cycle I - Observational Study and Ideation

Summary of Observational Study

Cycle one of practicum two was all about getting feedback from actual users to influence our interaction designs. To do this I performed an observational study which itself was essentially a three stage process. The first stage was performing a task analysis via the use of hierarchical tree (or trees in my case). My two trees represented coloring on a page and coloring on a tablet. These two trees caused me to generate questions about both interactions (tablet and standard coloring). In the second stage, I designed a protocol for the study in response to the questions I generated in the task analysis stage. This protocol featured questions/techniques that were primarily designed to elicit responses from users that showed differences between tablets and paper. Finally in the last stage I used the protocol to carry out the study on three users. With the information from the study I designed my interactions.

Protocol Summary

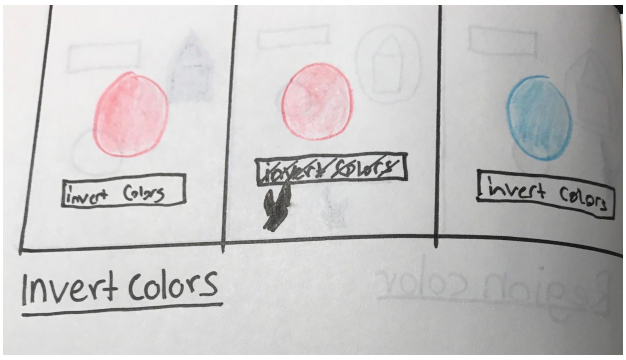
My protocol for the observational study consisted of three overarching segments. The first segment was, preliminary questions, where I got a general feel for how a user felt about tablets and paper for drawing. For example one question I asked users was if they "preferred tablets over classic pen and paper". The second segment was the experimental procedure, which consisted of observing a user color on paper, in a freeform tablet app and on colorfy. In the final segment I asked the user post questions that got a feel for how a user felt about the tablet and paper coloring experiments after the procedure. One example post question is "What features from a tablet do you wish you could use with classic pen and paper?". (Note: to see full design protocol please see the cycle one link)

Themes

From the observational study I generated the following five themes the held consist across the users I interviewed.

1) Users thought they would prefer pen and paper initially, and many agreed after.
2) Users wanted the tablet to act more like a physical object. (i.e. shading and physical feedback)
3) Its easier to undo on a tablet vs paper
4) Texture of drawings is better on a piece of paper than on tablets. (cross hatching, brush techniques)
5) Users didn't like structured nature of colorfy. (and also the ads)

Sketches


Invert Colors
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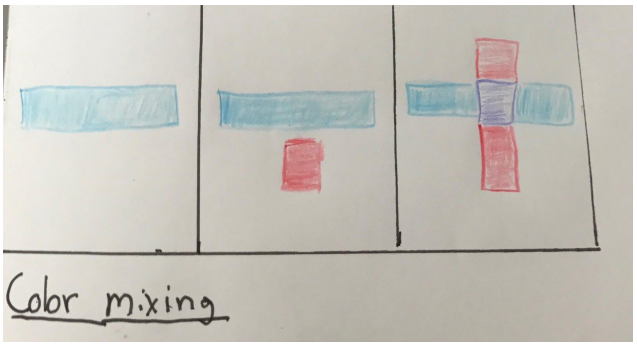
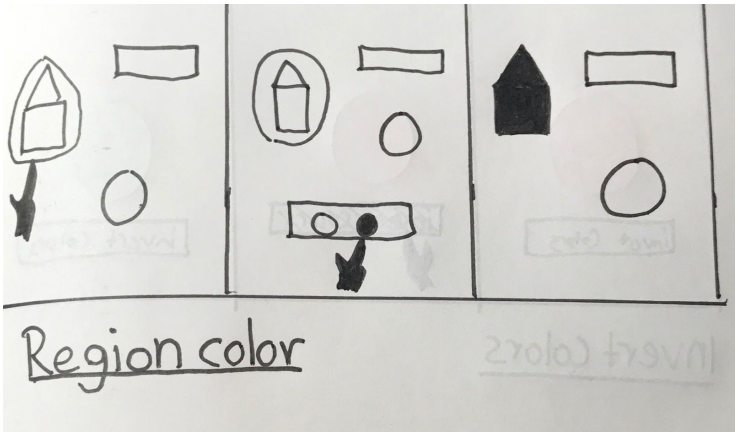
Invert Colors

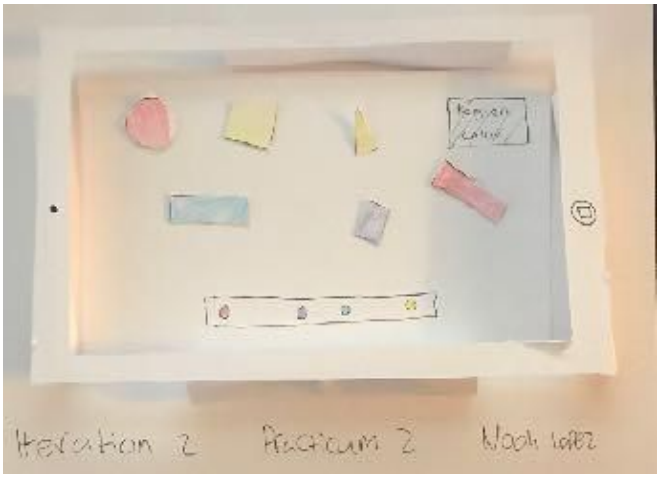

Color mixing


Region color

Design Cycle II - Paper Prototyping and Wizard of OZ

Summary

In cycle 2 of practicum 2 we were focused on refining our interactions so we could code them up. To do this we first constructed paper prototypes which displayed our interactions. We then performed “Wizard of OZ” experiments to demonstrate our interactions to our peers in studio. Our peers then gave us feedback on what we needed to refine in our prototypes. Finally we constructed refined paper prototypes with this feedback that were ready to be coded up.

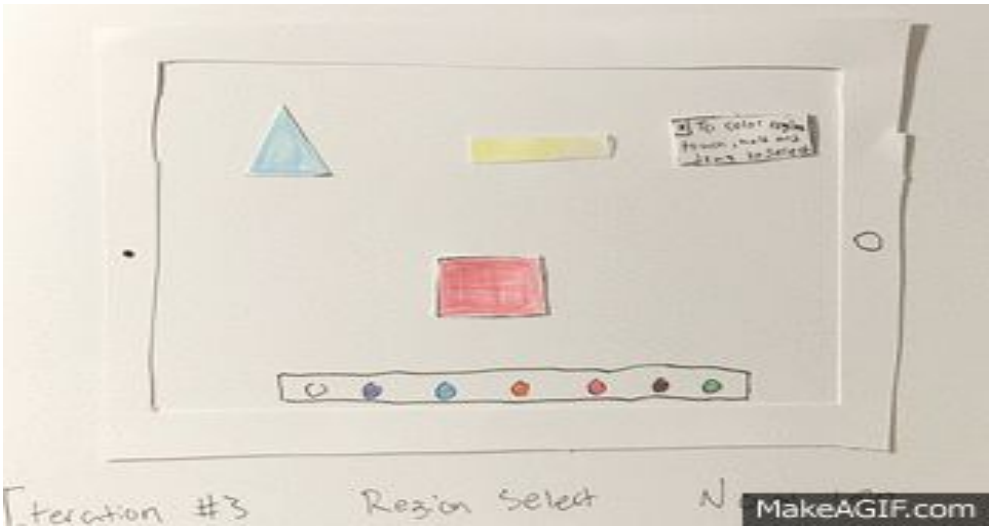


Initial paper prototype with description

In my initial prototype I placed a large emphasis on the construction aspect of paper prototyping (ie. building a “mock tablet”) rather than honing the interaction. As a result this initial prototype lacks the nitty gritty details of the interaction and was a little hard to explain to my peers. The basic idea of the interaction in this prototype was for a user to press the region color button, select the shapes to color and then select a color to fill in.

Gif of final paper prototype with description

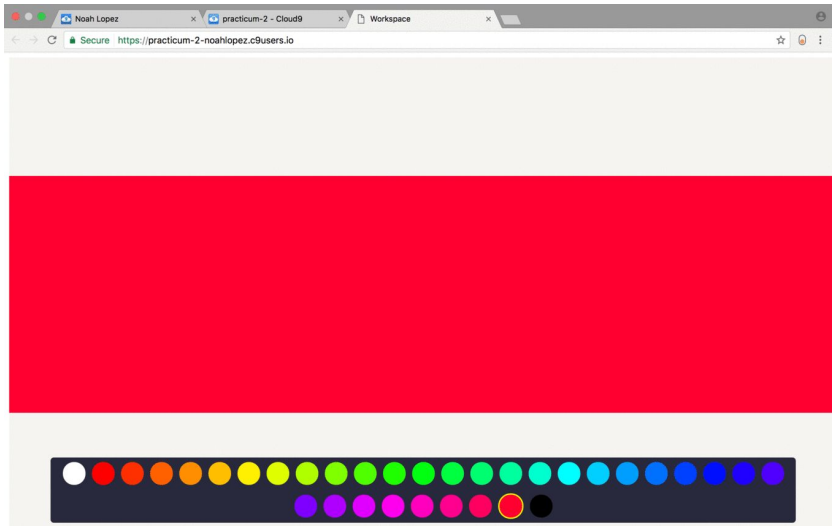
For my post studio prototype less time was spent on the construction of the paper prototype and more time was spent on the interaction it presents. In this iteration of the interaction, to region color, a user holds the screen, drags their finger to select areas to color (Note: their finger is followed by an arrow, and the shapes they select are highlighted with red), and finally they select a color to fill the areas with. To ensure a user knows about this interaction an instruction box will be displayed when the app starts. (Note: this instruction box can be closed whenever a user would like)



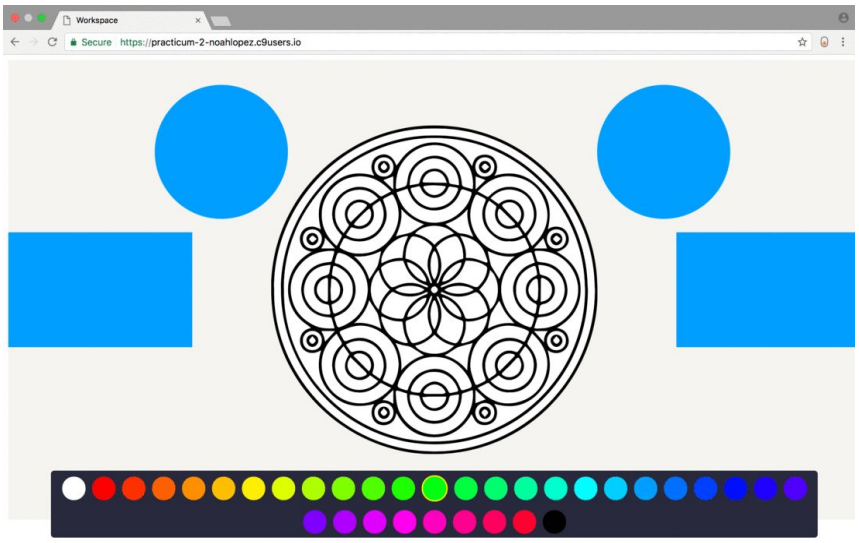
Design Cycle III - Implementation Prototype

Gradient Selector GIF

This gradient selector gif is a shortened version of the original. The original is having difficulty loading on google docs (it's giving me a triangle box with an arrow most likely because it's too large) but it can be found at memex #959



Interactive prototype gif with description



The GiF shows a user using region color to color the four shapes that surround the mandala and the mandala itself. As you can see as the user drags across the screen a red arrow will follow their finger and as they cross over regions there borders will be highlighted in red.

Narrated video of interactive prototype link

My narrated prototype video can be found at https://youtu.be/0cpK-MMmRS0

Design Cycle IV - Pilot Study

Protocol

Preliminary Questions (2-3 min)

1. Have you ever drawn/colored on a tablet?
    a. Have you ever used a stylus to color?
        a. Do you prefer the stylus over your touch to draw on a tablet?
        b. Which is more accurate?
    b. Do you feel your pure touch is accurate enough when drawing on a tablet?
        a. If no.. How might touch as a form of input be improved?

Task: Can you color this tablet page for me? (3-4 min)

1. Explain what talking aloud is, and ask the user to talk aloud for the remainder of the task.
2. Explain the noticeable features of the app (ie. color palette, and **REGION COLOR** feature) being sure not to place emphasis on Region Color
3. Observe the user and take notes

Post Questions (4-5 min)

1. Did you use the **Region Color** feature?
    a. Did it make touch as input more feel more accurate?
    b. Did it enable you to complete your task quicker?
2. If user did not use **Region Color**…. Why did you not use **Region Color**?
    a. What can be improved with **Region Color**?
    b. Do you think it's a useful feature?
3. Are there any features you would like to see implemented in this coloring app?
4. Any other questions or comments?

Description of user experience (notes on user interactions)

Summary

USER A: User A felt that touch was not accurate enough for drawing on a tablet initially, used a combination of region color and touch in the study, felt that region color was more accurate than touch after the study, and wished there was an undo function implemented.

USER B: User B felt that touch was not accurate enough for drawing on a tablet initially, used a combination of region color and touch in the study, felt that region color was about as accurate as touch after the study, and wished there was a way to deselect selected regions

Note: full notes can be found at ...

https://docs.google.com/a/berkeley.edu/document/d/1avISdPlE_yQ91Sz1ZRKs5B8TUAgLY6kAUH4KHW9In5I/edit?usp=sharing

Reflection on ways to improve interaction

For the most part I am happy with the results of my pilot study but if I had to improve my interaction all I would need to do is incorporate my users feedback. Which in this case largely has to do with the implementation of undo features. For example I could implement a toggle to let a user deselect selected regions. I could also implement an overall undo button which undoes the last color fill in on the canvas.

Reflection

Reading Question: In Shneiderman's Creativity Support Tools , three types of creative processes are described. What type of creative process does your coloring interaction best support. Describe how your coloring interaction might look like to support each of the other creative processes?

Response: In Ben Shneiderman's *Creativity Support Tools,* he defines three creative processes Structuralist, Inspirationalist and Situationalist. The Structuralist creative process is orderly, being defined by "several stages, such as preparation, incubation, illumination, and verification.". Contrastingly in the Insprirationalist creative process breaks free of structure and encourages things like "meditation, hypnosis, dreaming, and playful exploration". Finally the Situationalist creative process focuses on the social and collaboration aspects of creativity. Of the three creative processes my region color interaction is most inline with supporting the Structuralist process. This is because rather than being revolutionary my region color interaction is an evolution of the existing drawing app structure. It is meant as feature to speed up the progress of a user by enabling them to color regions quicker. (Note: while my interactions structuralist support maybe a stretch for some, I felt it was most inline with this process due to this emphasis on progress) My region color interaction does not propose a novel way of looking at the coloring app that would be important to the Inspirationlist creative process. Nor does my interaction app facilitate the social aspects of the creative process that is key to the Situationlist process. An interesting way to modify my interaction so that it could support both the inspiration list and Situationlist processes would be to implement it as "two person region color". In two person region color one user would be responsible for soley selecting regions while the other would be responsible for selecting colors. For the Situationist process this would make region color a social interaction between two users. The Inspirationlist process would be supported because not only is this a novel way of looking at a coloring app but the users gain inspiration from each others choices.

Reading Question: Describe how your coloring interaction adheres or does not adhere to each of Resnick et al.'s "Design Principles for Tools to Support Creative Thinking". For those

that don't adhere, how might a redesign of your interaction better follow that design principle.

Response: In Mitchel Resnick's and his colleagues' paper "Design Principles for Tools to Support Creative Thinking" they propose twelve design principles. In this response I will outline whether or not my interaction adheres to each of these principles, which for sake of readability, will be presented in the list below

1. Support Exploration
My region color interaction does not fully adhere to this design principle. While it does give the user the ability to easily and efficiently explore new color ways it does not give them the ability to undo the changes they made. A redesign to support this interaction would be to simply add an undo button for region select.

2. Low Threshold, High Ceiling, and Wide Walls
Region color does indeed adhere to this design principle. It provides a low threshold for new users (ie. its simple to hold and drag to select shapes), a high ceiling for more experienced users (i.e. can be used for selecting interact regions of a mandala) and wide walls (i.e. regions can be selected in any manner a user wants.)

3. Support Many Paths and Many Styles
The region color interaction adheres to this design principle because it does not completely eliminate traditional touch to color. A user is very likely to use both when using the app.

4. Support Collaboration
Region color does not adhere to this design principle because it in no way evokes collaboration. To adhere to this design principle I could modify region color into the "two-person region color" interaction I described in the previous prompt

5. Support Open Interchange
Multiple tools (or programs) were not required for region color so it really does not adhere to this design principle. To modify it to support it we could have region color use an outside source to identify similar regions to color.

6. Make It As Simple As Possible - and Maybe Even Simpler
Region color as it stands is about as simple as it can possibly be so it definitely adheres to this principle.

7. Choose Black Boxes Carefully

The implementation of region color is “black boxed” all the user needs to know about how to use it is what appears on the screen. Thus, region color adheres to this principle.

8. Invent Things That You Would Want To Use Yourself
For me, touch on tablets is not accurate enough of creative processes like drawing/coloring and region color helps improve this accuracy. It is something I’d like to use and thus adheres to this principle.

9. Balance user suggestions, with observation and participatory processes
Region color was designed in response to are initial task analysis were we got user suggestions, did observation and utilized participatory processes. Thus my interaction adheres to this principle.

10. Iterate, Iterate - Then Iterate Again
Region color is an amalgamation of three iterations, so it adheres to this principle.

11. Design for Designers
All of our classes interactions (including region color) should adhere to this principle. Any coloring app is meant for designers (in some sense) who create.

12. Evaluation of Tools
Cycle IV (the pilot study) is a means to primarily evaluate our interactions. So our interactions as they stand now don't necessarily adhere to this design principle but will after we incorporate the feedback from cycle 4.

Links

Cloud9 Workspace	https://ide.c9.io/noahlopez/practicum-2
Cycle I Report	https://drive.google.com/a/berkeley.edu/file/d/0B_hIfVG6z2pZdHh2b3U0TWlzQ3c/view?usp=sharing
Cycle II Report	https://drive.google.com/a/berkeley.edu/file/d/0B_hIfVG6z2pZVWgydFh4UUxWZ00/view?usp=sharing
Final Report	https://docs.google.com/a/berkeley.edu/document/d/11Nuf4PhRsoh1It1W2XOZwdYb1hj1GGzsG79t4pcqsPI/edit?usp=sharing