DESIGN REPORT #3

THE PROCEDURAL AFFORDANCE • COLORING INTERACTIONS

#HUMAN_MODEL_PROCESSOR, #DIRECT_MANIPULATION, #COMPUTATIONAL STRUCTURES

I paint my own reality. The only thing I know is that I paint because I need to,
and I paint whatever passes through my head without any other consideration.

Frida Kahlo (1907 - 1954)

[Inara Rupani]
[Google Doc - IR]
[FIGMA - IR]
[AWS - IR]
For AWS I have also send an email to Shreyosi with the updated password

DEADLINES

Module Release	March 3
Module Due Date	March12, End of Day to Canvas

Module Exam	March 12–14

TEACHING OBJECTIVES

- A theoretical understanding of the Human-Model Processor.
- Ability to conduct a task analysis and decompose an interaction down to the cognitive scale.
- Ability to program direct manipulation interactions using a scene graph (paper.js)
- Ability to integrate computational mechanisms (state machines, bayesian inference, and graph traversal) into interaction design
- Ability to identify the challenges of creativity support tools versus productivity support tools

DESIGN BRIEF (100 PTS TOTAL)

In Module I/II, we learned how to ground an interaction within a metaphor to minimize the gulfs of execution and evaluation. We were able to diagnose potential usability issues by walking through the high-level actions of a user (cognitive walkthrough) and tailor the UI to help users reach their target goal. Implicitly, the action-cycle sets goals as the starting point of any interaction … but what if there are no goals?

Think about how you feel when you are in front of a blank piece of paper or a blank canvas. Do you have any goals in mind? How did you choose what to execute? How did you evaluate success? These are complications introduced by interactions aimed to support creativity and exploration.

As a starting point to this module, you have been given a coloring book paper.js application to modify. Currently, the coloring book app draws from the **paint-can metaphor**. If you click on a color and then click on a corresponding space in a design, it will fill that region with the last color selected. The interaction is perfectly usable - there are clear affordances and feedback mechanisms and no-critical slips…

…but can we move beyond emulating the real-world?

1. Week 1: Drawing from Murray Chapter 4,, you will be coding up **2 new coloring interactions** that increase procedural complexity.
2. Week 2: You will then evaluate your interaction by demonstration, providing video documentation of the interaction look-and-feel and exemplar artifacts that showcase the value added by your interactions.

The final deliverable will be a **LINK** to this design report.

RESOURCES

Paper.js Documentation
Getting started with Paper.js

0. SETUP

One person should set up and start a Cloud9 instance. Review the setup routine we did in class.

Git repo: https://github.com/CSE3392-S2020/module2-coloring-book

In the Cloud9 terminal, navigate to the coloring book folder.

To install dependencies:

```
bundle install
```

To start the server:

```
rails server
```

Add an Instructor account to your Cloud9 Environment

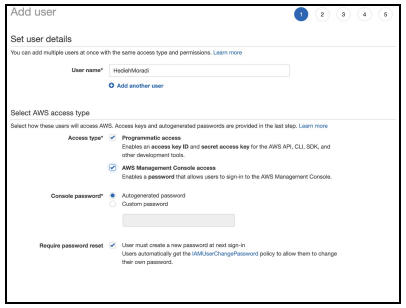
(Will go over this next part in class)

1. **Creating an IAM Group** Follow steps 2.1: 1-8.

2. For each member in your group, **Create a User**

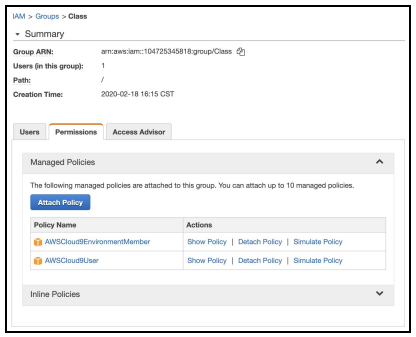
Username - Instructor

Choose a Custom Password > CSE3392!

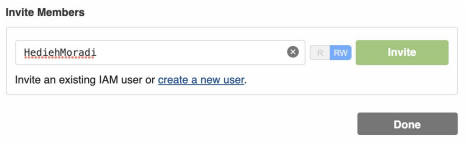


3. **Attach a policy to your Group**

1. AWSCloud9User for AWS Cloud9 user access permissions, or
2. AWSCloud9Administrator for AWS Cloud9 administrator access permissions.



4. In your cloud9 environment, you can now add the IAM user.



Make a user called **Instructor** with password **CSE3392!. Email login to shreyosi.endow@mavs.uta.edu.**

Post your Cloud9 environment URL here:

[https://us-east-2.console.aws.amazon.com/cloud9/ide/7c94b0cd46cc41dabe433772de24dd4a]

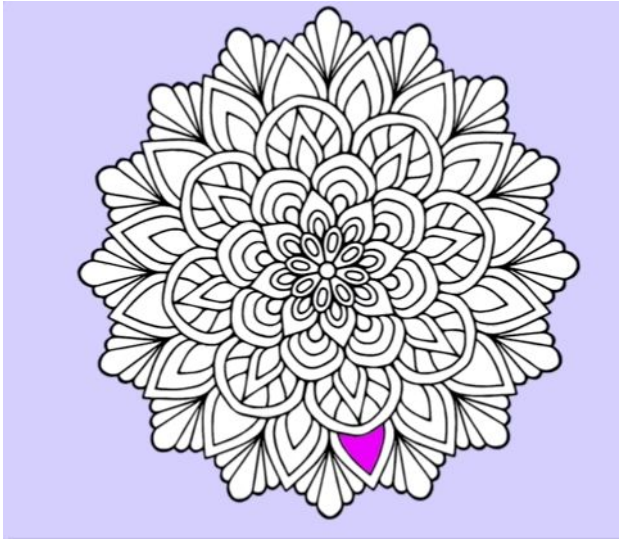
1. PROCEDURAL COLORING INTERACTIONS (50 PTS)

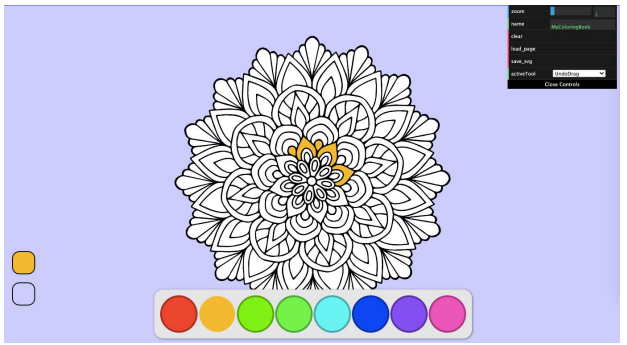
You should only be adjusting the **/app/assets/javascripts/book.coffee** file or **/app/views/book/color.html.haml** file

Develop **2 coloring interactions** that leverage the procedural affordance of the computer.

As a simple example, let our computational structure be a **finite-size FILO Stack.** If a user's color choices are fed into this computational structure, then it essentially encodes the last N colors selected by the user.
Visually, this history tracker acts as an accelerator interaction, since a user will most likely select previously used colors.
This interaction functions as a **running shoe,** allowing the user to more quickly specify color intentions.

CREATIVITY SUPPORT GOAL	COMPUTATIONAL STRATEGY	PROCEDURAL INTERACTION	GUI	GIF [USE GIPHY]
Running Shoe	Template Matching	Similar-select	Control threshold based on distance from mousedown	GIF of a coloring session 

Ski	**Threads**	**Rainbow Color Paint**	**Click**	
Ski	**Threads**	**Dashed Border Flicker**	**Click**	

Running Shoe	Template Matching	Undo Drag	Drag	

As part of your process, you may wish to observe how different people color, engage in a coloring session yourself, brainstorm different computational representations, produce sketches and wireframes, develop Figmas of different UIs, program implementation sketches in the paper.js playground, and even conduct quick heuristic evaluations/cognitive walkthroughs.

Minimum

- Present your interaction ideas in #Critique. Be mindful that our Design Appropropriation Policy applies here: if you choose to copy somebody's idea, it needs to be significantly different enough to read as "inspired by", as opposed to copied. You need to cite your design inspiration.
    - The earlier you post, the easier it will be to call "dibs" -- i.e., you get intellectual property on your idea.
- Maintain documentation of your design process in FIGMA. Show low-fidelity to high-fidelity workflows.

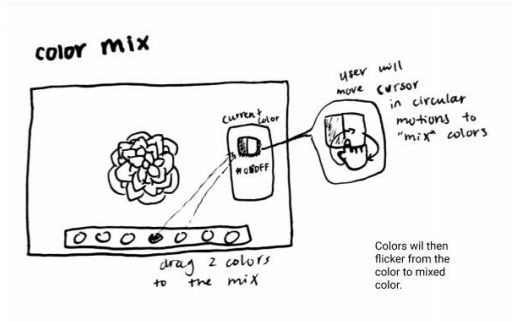
✓ ++ Suggestions

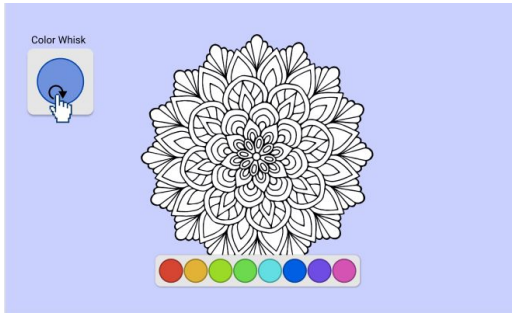
- Successfully guide your peers toward interactions that have leverage stronger procedural affordances.
- Clear forward iterations of your design concept.
- Documentation of a cognitive walkthrough or heuristic evaluation for someone else's interaction.

Cognitive Walkthrough of An Nguyen [Coloring Book - FIGMA link]

Goal: Mix two colors for a final color to fill in.

Color Whisk (Interaction1)





Gulf of execution

What can I do and how can I do it?

Intention - I need color the mandala

Plan Actions -

- Choose one color
- Choose another color when the swatches are flickering (waiting for second color to fill in)
- Wait for two colors to be combined on the indicator

Execution of action sequence

- Move the mouse as the indicator picture resembles and come up with a hue of color (light or dark) of combined color

Gulf of evaluation

How do you know it worked?

Action: Combined Colors

- Perception: combined color changes on indicator
- Interpretation: when the petal is clicked it will show the new color
- Evaluate: The shade is lighter/darker

What can be fixed for users? (Heuristics)

→ **FS**: The coloring book looks like a trial and error which lets the user know their next move. It could use a pop up for quick instruction.

→ **R&R:** the user shall be notified that the second color shall be different from the first one to create a new color.

→ **UCF:** An undo option shall be added as it will prevent wrong color mix and the user wont have to start from the beginning. They can just unselect the wrong mix to continue mixing.

→ **R/R:** Common color mix examples shall be shown for users to know what colors are mixed to get what color. Or a color wheel would be more appropriate.

2. EVALUATION BY DEMONSTRATION (50 PTS)

Provide 3 exemplar designs that show **the value of your interaction.**
[TODO: Screenshots here]

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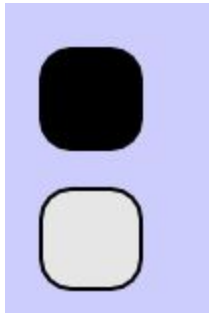
<td>  </td>
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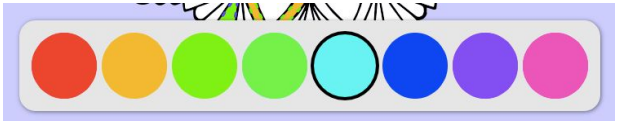
<td>  </td>
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Create a 1-minute video walkthrough of your interaction that shows the **usability of your interaction**. Annotate the video with titles and captions. Include the exemplar designs at the end of your video.
[Youtube - IR]

✓ **++ Suggestions**
> Craftsmanship in video composition
> Voice over, titles, melodies

**** MAKE SURE THIS DOCUMENT HAS OPEN SHARING PERMISSIONS BEFORE TURNING IN.****