CS4530 FINAL PROJECT: C/PLACE

Group 201: James, Sachin, & Rebekah

Our Feature: A Collaborative Pixel-Art Board

Our project idea, c/place, is inspired by the collaborative project *r/place* on Reddit. It is a new type of interactable area that allows users to express themselves artistically and work together to incrementally contribute to a large digital canvas. The driving idea behind r/place is that "Individually, you can create something, but together, you can create something more," and our feature is driven by this core idea identity of community.
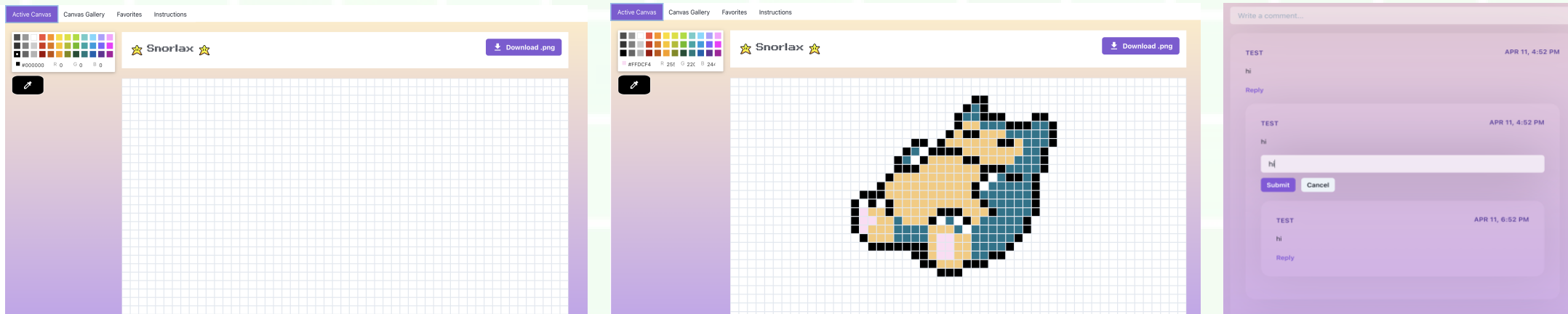
Using a grid system where a tile represents one "pixel", a player can choose to change the color of one square at a time using a color picker. This type of interaction introduces a more asynchronous activity that allows users to gradually contribute to a town over time, encouraging them to return to continue their masterpiece and see what others have added to it. Additionally, users can interact through the comments section, and download the artwork as a png to share with friends. After a certain amount of time has passed, the canvas will be wiped to allow a new creation to be made, making space for new forms of expression, and storing past canvases in an art gallery for users to view. Once in the gallery, a canvas can be viewed as a time lapse, allowing the user to rewatch the creation process of the canvas from start to finish.

Demo and Source

Our demo site is available at https://main--spring-23-team-201.netlify.app/ and our code at https://github.com/neu-cs4530/spring-23-team-201

a user joins our interactable area by approaching the art station and pressing space. From there, they can create a new canvas or join the existing one, leave comments, and view past canvases in our gallery. There is also an instructions section for people who are new to familiarize themselves with, and a favorites section to store your liked canvases in.

Our Technology Stack & Design

Our interactable area closely follows that of other interactables -- we defined a new area named WhiteboardArea that extends the InteractableArea class. WhiteboardArea contains the current active canvas (if there is one), the list of comments for that active canvas, and the list of gallery canvases, where one galleryCanvas contains the pixel array history for that canvas. A canvas has a name and a list of pixels, where a single Pixel has an id, x & y coordinates, and a Color. Finally, Color is broken up into 4 number values for r, g, b, and a.

We defined comments so that players could start discussion threads and reply to each other more directly. This meant that for each comment, we needed to keep track of the list of replies and the parent comment's id. Having a creation date and author also allowed comments to display who posted what and when on the frontend.

The greatest difference in the design of our interactable area is that, upon creation, its destruction is determined by a timer rather than players leaving the area, using sockets that emit and listen for the start and stop of the timer. Once created, a canvas will exist for the duration of 72 hours, regardless of whether there are players in the town, and then destroy itself automatically.

For the frontend, we mostly used Chakra UI's components. A Canvas, for example, is a mapped SimpleGrid of Boxes, where each pixel in the canvas array corresponds to a single Box component. We also leveraged existing React libraries for the color picker and eyedrop components, using react-color and react-eyedrop, respectively. We added the flexibility to convert from a hex code to our rgba object, which allows for any color to be chosen outside of the color picker's default options.

Future Work

The many techniques involved in pixel art afford a wide range of possible opportunities to expand upon with our project in the future. One such example would be the ability to adjust the size of the canvas when creating it, to allow for different landscapes to emerge. Another idea is to add color palettes that could be browsed by the user and switched in and out, with the ability to create their own list of "favorite" colors. The added touch of being able to download a video of the time lapse would also be a nice touch -- for users to further share their process with ease.

We feel that to best preserve the gradual and collaborative nature of the canvas, our current feature should remain a "one pixel at a time" type of action. However, perhaps a solo mode could be introduced for users who want to hone their skills before entering a larger project, and this version could contain a wider range of tools such as a fill bucket, stamp tool, etc., that might be disruptive in a multi-user mode. Finally, more resources for learning could be provided to further help beginners get started.