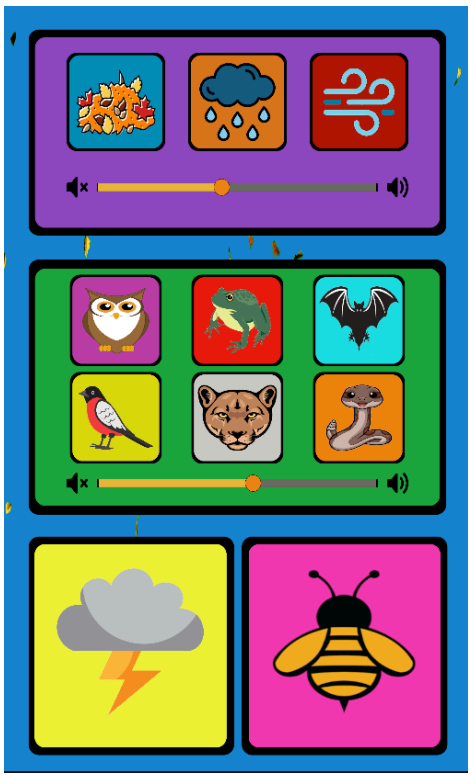
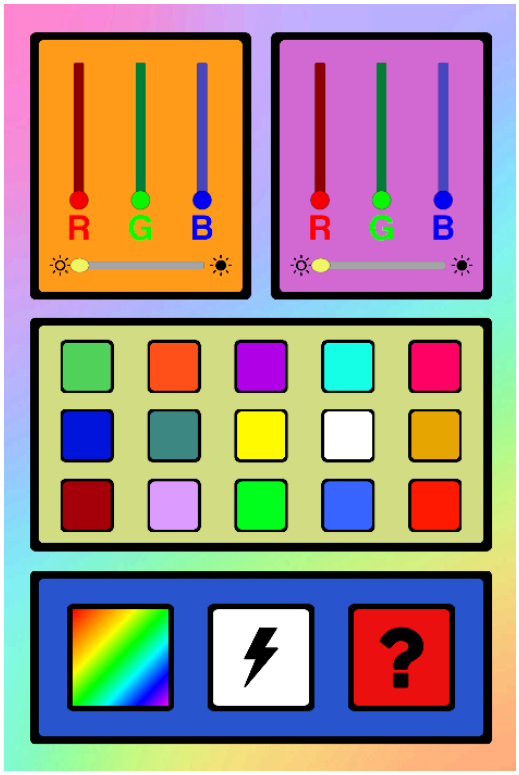
I.D.E.A Museum

Project Overview & Contributions:
The I.D.E.A Museum, a children's educational museum in Arizona, commissioned us to develop Maker's Forest, an interactive exhibit featuring metal trees and kiosks with mounted tablets running a variety of apps. My role was to develop the software for 5 of these tablets. One of the tablets ran an app that allowed guests to control the exhibit's lighting and another allowed guests to control its sound system. The other 3 tablets ran a version of "Face Creatures" which is a snapchat like camera app. I was also involved in the process of designing the communication system that allowed these tablets to interface with the lights and speakers and created custom cables needed for parts of the exhibit.

Sound App:
The sound app was built in Unity and functioned as a basic sound board with some particle effects added. Users had the option to switch between 3 ambient sounds which would play on loop over the speakers in the room. Selecting an ambient track would trigger a corresponding particle effect on the app such as falling raindrops for a rain sound providing some visual feedback. Users could also play themed sound effects, like a lion's roar. The tablet was connected to an amplifier installed inside one of the trees. Speakers were then connected to the amp through speaker wire hidden within the branches and trunks of the trees.

Lighting App:
The lighting app was more complex than the sound app, requiring integration with a TouchDesigner application to function as a DMX controller. Since the lighting control kiosk was mobile, direct wiring was not an option. To solve these issues, we installed a dedicated router and a PC with the touchdesigner app on it in the control room, linking them to the tablet over a private network. The Unity app communicated with the TouchDesigner software via UDP signals to adjust the exhibit's lighting. Users could control the lights through RGB sliders, preset color buttons, and various lighting effects.





Face Creatures:
The remaining three tablets each had a version of Face Creatures installed, with each one corresponding to one of the animal sculptures in the room—a bat, a panther, and an owl. I drew inspiration from Snapchat for the design of this app, which I developed using Python. The app relied on the MediaPipe library, which helped with the most challenging aspect of developing this app, the face detection powered by machine learning. Once a user's face was detected by the camera, the app would overlay a filter representing one of the animals. The user could then press the camera button to capture an image, with the option to either retake the photo or confirm their selection. Upon confirmation, their image would appear on a corresponding sculpture of the animal, displayed within the trees in the room. Small monitors were mounted into the faces of the animal sculptures to give this effect.