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Project: Limitations

Important Note: My Project is incomplete and still a ways off from finishing due to these limitations in Andriod Studio (I hit a wall).

Limitations: Android Studio Features

What Does Not Work

1. AR Camera and Drawing function at the same time is not possible on Android Studio?
    - Android Studio has no way of running both the camera and drawing app at the same time based on my research on the official website.
    - There is a way to implement a camera function into your android app. However there seems to be no possible way of running a "custom drawing" feature while the camera function is running as well on the Android Studio Tool.
    - If I can't run both features at the same time, this prevents me from creating an interactive AR shape drawing app on Android Studio!

2. No way of converting 2D shapes to 3D shapes after drawing\painting a shape in real time.
    - Android Studio has no way of converting 2D shapes to 3D shapes in real time after drawing the 2D shape out.
    - The idea was to code in a way where the app can tell what shape it is drawn then be able to identify it. Once identified, the app will stop for a bit and

convert the identified 2D shape to 3D shape in real time. I would have created an IF statement where if the shape drawn is identified as the following, it will execute the code that will produce its 3D form.

- However, the Android Studio Tool is not capable or does not have the ability to convert shapes from 2D to 3D during execution. Once a program is executed, it will only take in 2D shapes or 3D shapes, not both.

❖ It is both these limitations that made me change my old concept/idea: "Draw, Produce, Interact" to something that might work in Android Studio which is "Spawn, Switch, Interact".

What Works Partially

3. Drawing and Painting works but it is limited and too basic

- On the official developers android studio website, there is a tutorial on how to implement custom drawing into your app. However the Custom Drawing on Andriod Studio is quite limiting.
- https://developer.android.com/training/custom-views/custom-drawing
- For instance, I can indeed make a working paint/drawing app on Android Studio. However when I physically draw or paint out a shape like a basic triangle with my fingers on screen, android studio has no way of identifying it as a triangle. Even if I created a function that defines what features a triangle has, Android Studio is not able to identify the real time physically drawn shape on screen as a triangle.
- Android Studio can only define PREDEFINED shapes which is quite disappointing. For example if I wanted to "draw" a rectangle on screen, I would need to use a function to create and define the shape.
    - ★ Example: drawRect(20, 20, 20, 20) will draw a square/rectangle on the screen
    - ★ Of course I can create my own functions that can draw the shapes, but that is not my goal.
- I wanted users to use their fingers and draw out the 2D shape in real time. Then once they are done, I will have functions made where the app is able to identify what shape the user drew. But there is no way to do that with Android Studio's current custom drawing capability.

4. Adding buttons with OpenGL API is different and more complicated

    - When the OpenGL ES2.0 API is implemented into the app, adding properties such as buttons and text become more complicated. For instance, I can no longer simply go inside “activity_main.xml”, and add buttons and custom text into my app and have it show up when I compile the code. I need to add new OpenGL ES2.0 features and code into the .xml code that somehow allows me to add buttons.
    - Android Studio has a whole section dedicated to OpenGL https://developer.android.com/training/graphics/opengl, but it does not go over how to add buttons and text into the OpenGL environment. Because of this I ended up struggling and focused too much on trying to find a way to implement buttons onto my app.

❖ This was where I hit a wall for my project and could not progress any further. Without a clear understanding of how to add button features with the OpenGL API, I cannot switch 2D and 3D shapes!

What I Hoped To Accomplish But Did Not Get To

5. Drawing 3D shapes in Android Studio

    - Because I did not understand and couldn’t find a way to implement a working button function under the OpenGL API, I was not able to switch between two different activities. One activity is supposed to be a place where users can spawn and interact with 2D shapes while the other activity is supposed to be the place where users can spawn and interact with 3D shapes.
    - This is very disappointing considering computer graphics 2 is all about 3D shapes and applying lighting to them which I wanted to try to produce on my Android Studio app. But that did not happen, not even close since I hit a wall due to these limitations.