An Augmented-Reality Application for Creating an Impressionist Art Style Using A Multi-Color Palette Scheme Selection User's Manual

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I. Introduction

A. System Information

This application is the second version of "Impress Me!". This application will simulate or apply an Impressionist Style onto an image which users can add predefined 3D models which can be anchored to the scene by using a Marker. This application outputs more expressive brush strokes and has the ability to dynamically select a color palette and the user can select whichever palette he/she wants. This application may help artists or art students in order to have a reference of what he or she may want to paint and may use the 3d models as part of their composition if they don't have the real object.

B. Organization of the Manual

The user's manual consists of four sections: Introduction, System Requirements, Installation, and Using the application. The Introduction section explains the summary and general information of what the application/system's purpose is. The System Requirements section provides a general overview of the system and the overall requirements of the hardware and software. Installation section explains how to install the system/application on the device. Using the Application section provides a clear description and details on how the system/application and its functions works.

II. System Requirements

A. System Summary

In order for the application to work properly, a server should be running at the same network. The application works with the server in order to process the images.

B. System Configuration

The application operates on a mobile device with any Android operating system. This application was developed with the use of Unity, ZeroMQ and Python. The application requires a medium to high-end device for the application to run smoothly. The server also needs to have a medium or high-end specification in order to process the images that will be sent back to the application.

C. User Access Levels

Everyone can user the application

D. Contingencies

When the application is trying to process the image; sudden incidents such as disconnection from the network or power outage, data won't be saved in the internal memory of the operating device. Using multiple devices isn't tested since the communication of the server and the application only uses request response framework. The server isn't guaranteed to handle multiple requests at the same time

III. Installation

A. Where to Install

The latest version is currently available and can be downloaded or cloned from https://github.com/johnmarvicroque/AR-Impress-Me.

B. Setting up the Application

If your server is up and running make sure that you also change in AR-Impress-Me\Assets\Scripts\ThesisScript\ClientSocketScript.cs line 99 the IP Address of your server in the same network. You may now deploy the application to your phone

```
99      reqSocket.Connect("tcp://192.168.0.6:12345");
100     reqSocket.SendFrame(message);
```

Figure 1: Line of code to change the IP Address

C. How to Deploy the Application

When the project has been downloaded or cloned, Unity should be installed and in order to deploy it on a mobile device go to File->Build Settings then select Android and then switch platform. After the platform has been switched make sure that your android device has the developer options and allow usb debugging and plug your device to the computer. If all has been set, under build settings make sure in the Run Device drop down your device has been selected and then hit build or build and run.

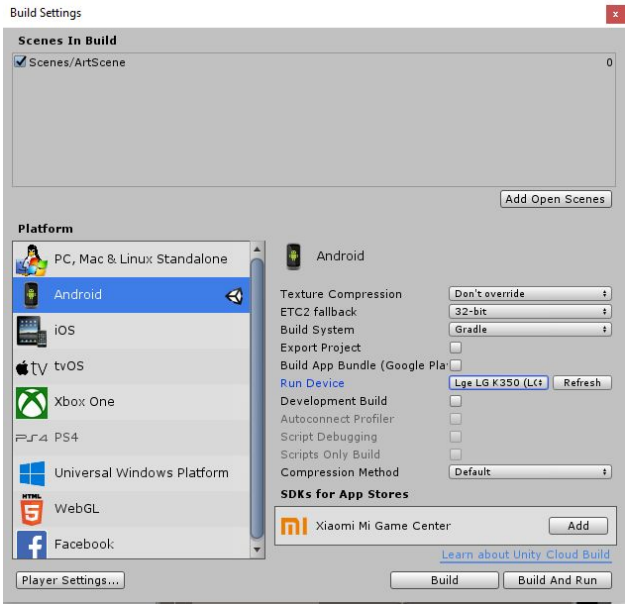

Figure 2: Default Settings on how to Deploy the application

D. How to Install and Run the Server

In the project folder make sure that you have any version of Python installed and all the dependencies that are needed are os, zmq, base 64, PIL. In the project locate AR-Impress-Me\Assets\Scripts\painterly-rendering-master, and in the command line run the server.py when you are ready to run the application.

IV. Using the Application

A. System Menu

In the application there are 5 buttons on the (Top Left), this is where the settings lie where you can modify what color palette you want and what opacity of a certain brush stroke would be. In the (Top Right) here you can select a singular brush stroke texture that will be rendered on your image. On the (Bottom Left) here you can add and remove 3d Models if and only if you have the marker (printed image) which is on the image Unity's Bag of Chips. And Lastly the paint button on the bottom Right which will take your image and render the photo.

Figure 3: How the application would look like

B. Adding 3D Models

To add 3D Models in the scene you need to have a marker or the printed image Unity's Bag of Chips in order to place the 3d Models. After clicking the "Add Model" button you will see the menu in Figure 4.

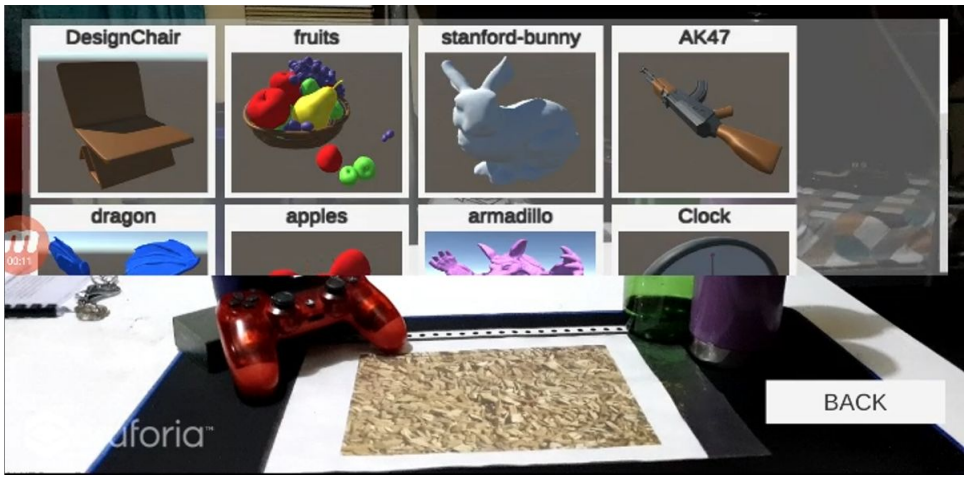

Figure 4: Menu on adding 3D Models

C. Selecting 3D Models

As you can see in Figure 5 If the slider appeared on the top and the “Back” button appeared instead of the “Paint Button” that means you have successfully selected the 3D Model in this you may remove, resize or reposition the selected 3D Model

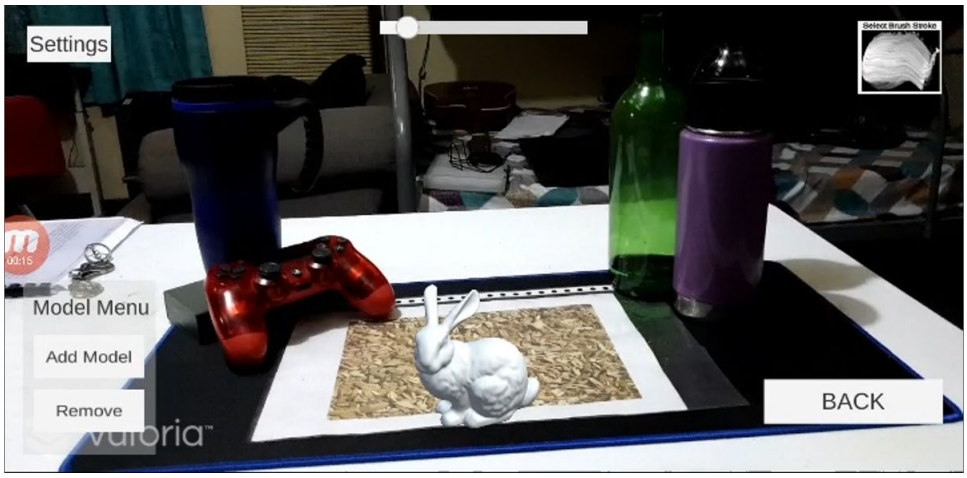

Figure 5: Selected 3d Model

D. Removing, Resizing or Repositioning 3d Models

In order to remove the selected 3d Model, just hit remove if you have successfully selected the 3D Model. In order to resize the 3d Model just use the slider on top, sliding it to the right will make the 3D model bigger on the left will be smaller. Lastly when the 3d Model has been selected; using your hands, just move the device physically and the 3d model will be repositioned then hit back to put the 3D model in place.

E. Selecting Color Palettes

In the start of the application when you hit settings, you may change what color palette your image would have. You may let the system decide what color palette it will use or you may use the (First) Pre 1886 Color Palette, (Second) Post 1886 Color Palette, or (Third) Final Years Color Palette. You may still change the color palette of the image after the image has been rendered.

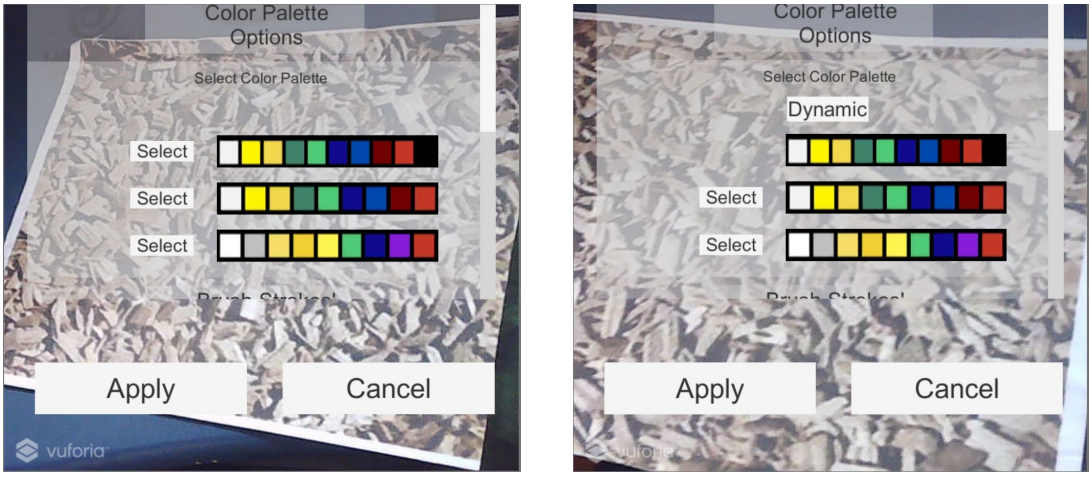

Figure 6: Color Palette Options

F. Selecting a Brush Stroke Texture

Either in the start of the application before and after rendering you may change the brush stroke texture that will be rendered for your application

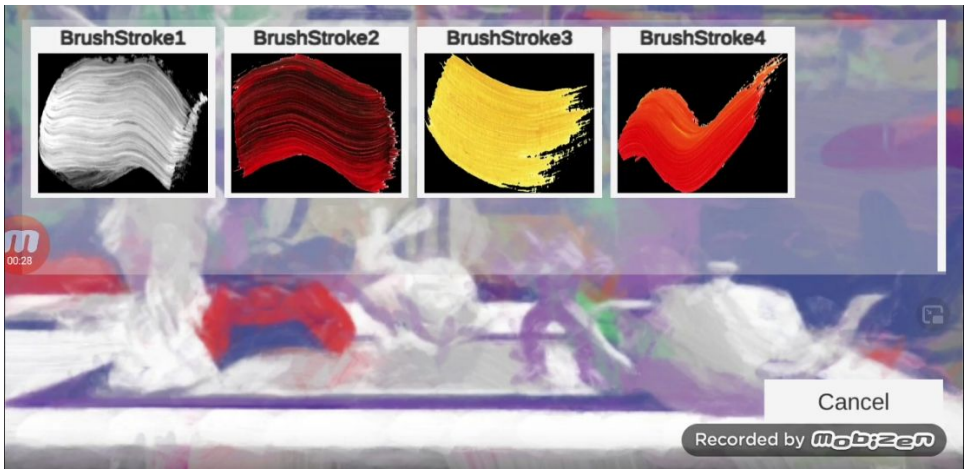

Figure 7: Brush Stroke Texture Menu

G. Brush Stroke Opacities

In this option there are a total of 6 layers which will have each brush stroke size and the opacity will determine how those strokes will be opaque on the screen.

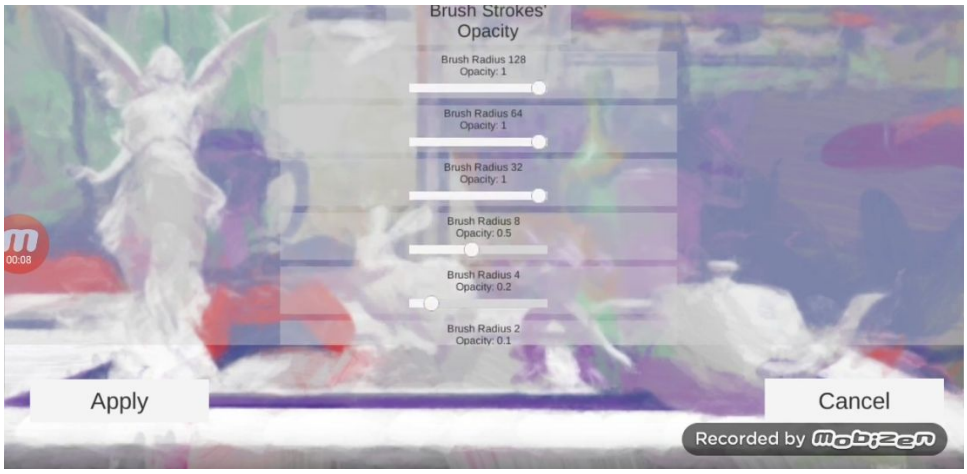

Figure 8: Brush Stroke Opacity Options

V. System Flow

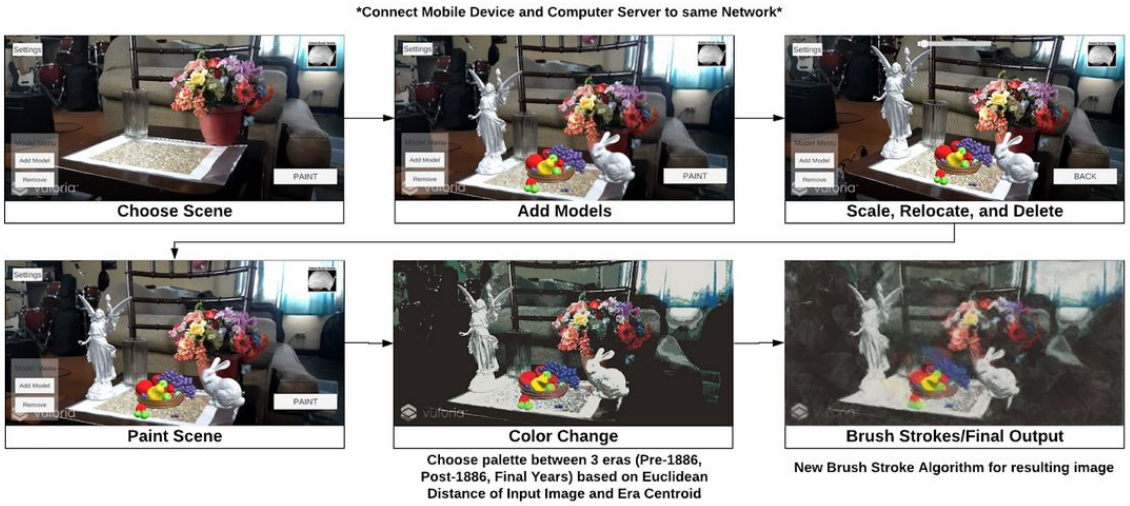

Figure 9: System Pipeline

VI. Sample Results

Figure 10: Final Years Palette with default Brush Stroke Opacities and Texture #1

Figure 11: Pre 1886 Palette with opacity of 1 for all brush strokes using Brush Stroke #2

Figure 12: Post 1886 Palette with opacity of 1 for all strokes using Brush Stroke Texture #2