Help Manual

Understanding the User Interface (Excerpt from the project report)

The main features and the UI components of the application, as running on an iPad device, are labelled in Figure 1. Every time the application is initialized from a terminated state, the default splash screen of a Unity application shows up, and the device camera gets activated. This is followed by a message on the screen that says, '*Please scan a surface to start*'. This message stays until the app is able to detect a horizontal plane in the scene. As soon as a horizontal surface is detected, a reticle marking (Label I in Figure 4) appears on the plane. The size of the reticle marking changes as per the distance of the horizontal plane from the device's camera i.e., for planes that are farther away, the marking size is reduced, and for the planes closest to the camera, the reticle size increases.

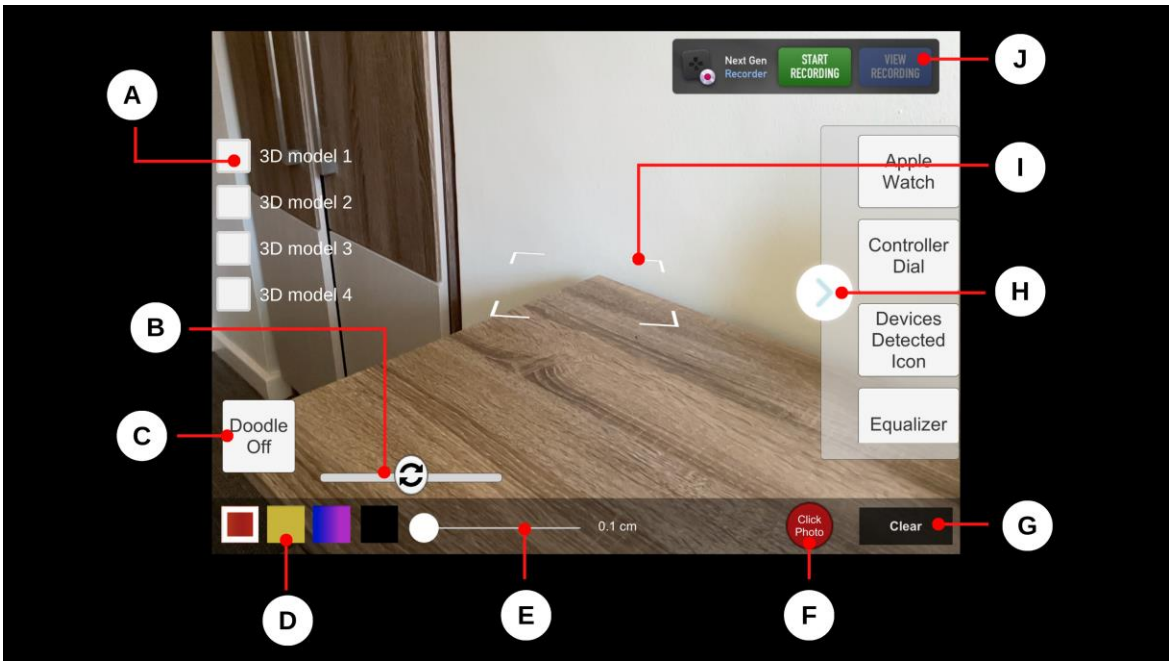

Figure 1. User Interface of ExemplAR. (A) Option to enable/ disable the display of marker-based virtual objects. (B) Slider for rotating markerless virtual objects. (C) Toggle for hiding/show doodles. (D) Colour palette for the stylus pen. (E) Slider to choose the thickness of the stylus pen tip. (F) Button to capture images/ screenshots. (G) Button to erase sketched information. (H) Collapsible library of in-app 3D models. (I) Horizontal plane detection reticle. (J) Video recorder controls.

The panel that appears on the left and consists of checkboxes (see label A in Figure 1) is dynamic in nature. It is not present on the screen when the app is first launched. Checkboxes start appearing as soon as a marker image registered within the app shows up in front of the camera and gets detected, one checkbox per 3D model. This gives the user an extra level of control over the virtual objects as the user can now toggle the visibility of the 3D model by checking/ unchecking these checkboxes. If the number of checkboxes exceeds the available vertical space on the iPad screen, this panel automatically turns into a scrollable list. Label C in Figure 1 depicts a button that acts as a switch to toggle doodling on/off in the app. The text displayed on this button reflects the action which the user would want to perform next, rather than the current state of doodling. For example, if the doodling has been turned

off, the button text would show ‘Doodle On’. Also, turning doodles off hides the bottom tool panel as well (except the image capture button).

There is also a provision for rotating virtual objects on the horizontal plane through a rotation slider. Usually, within AR apps, to rotate a virtual object, it is first picked using a finger and a thumb and then it is rotated either clockwise or anti-clockwise. But in a scenario where there are too many augmented objects in a scene, such an action can be tricky to perform. Thus, a rotation slider offers more control than the pick and rotate touch input. The bottom toolbar provides four options (labels D, E, F, and G in Figure 4). There is a colour palette with an option to choose from four colours – red, yellow, a blue-purple gradient and black. Next to it is a slider, using which the user can change the thickness of the stylus tip. The minimum value is 0.1 cm, and the maximum possible tip thickness can be 2 cm. Label F is a button to allow capturing screenshots, which can then be augmented in the AR scene similar to other 3D objects. Label G represents a button that would clear the screen from all sketched doodles. It is worth noting that this button doesn’t affect the augmented objects and is meant to work only for the sketched information.

There are two UI components on the right edge (Labels H and J) – a collapsible panel and controls for video recording. This panel acts as an in-app dynamic library of 3D models that are shipped with the app. The images captured from within the app also appear at the end of this library but are not saved on the device or within the app cache. The video recording controls comprise three buttons, one each for starting, stopping and viewing the video recording.