Technical Plan – User Interface/User Interaction Designs

The user interface will use a smartphone and Microsoft HoloLens to allow the user to interact with the augmented reality aspect of the project. The project will largely interact with events and commands that happen in reality, and translate these into a specific function to happen within the application. The user interface itself will be simple, offering a projection of the real-world on-screen/in the user’s view. The application will constantly be checking to see whether it recognises any real-world objects around it, such as analysing the distance & size of surfaces, or identifying a card that forms part of the play-space. This will then augment in to the view. For example, seeing a card on a surface will result in the application projecting what appears to be a 3D model of the card on to the surface, using both the surface size and the distance/angle from the user to decide the scale of the model. What in reality looks like a simple card will be translated to a 3D projection of that model through the augmented reality application.

The application will have a small ‘HUD’ projected on top of the camera view. This will allow the user to see things such as scores, who’s turn it currently is and allow the user to access the menu options. Through here they can change various settings such as accessibility, text sizes or close the application. The HUD will occupy the perimeter of the view. For example, scores for each play may appear across the top, while a menu button appears at the bottom. Keeping track of the turn will be central, at the top of the screen, so the user can always see the current state of the application. While the display will show live, real-world footage, in the event of a recognised object being identified the display will project a 3D model visible only through the augmented reality application. This will ultimately give the user more depth to a simple real-world game.

Interaction with the application will be done in two ways. First will be the analysing of the real world. This is achieved simply by looking around the real-world play-space, this is an automated process in which the application will constantly analyse to see whether or not it recognises any of the surrounded objects. Via this, the application will be able to ascertain what to display, where to display and how it should be displayed. Complex calculations in the background will take place – particularly on working out the angle and draw-distance of the augmented models. All of this happens will no user commands; the user looks around with the camera.

Secondly will be the menu command, in which the user does a gesture with their hands in view of the camera, similar to a click, where they press their index finger and thumb together. The application will recognise this gesture, which will augment the menu over the application. From here the user can pause an in-progress game, access the accessibility settings or exit the application. This is the only form of direct interaction with the application itself; the rest of the user interactions being indirect based on recognised objects and events in the real-world.

Alternatively, the HoloLens provides support for voice commands. This would enable the user to use their voice to perform direct interaction with the application. For example, if the application detects the word “Menu”, it could then bring up the menu, removing the need for hand gestures which could prove problematic to certain types of autism. Allowing either hand-gestures of voice commands will greatly enhance the accessibility of the application to a vast range of autism sufferers.