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Section 2 | Real-Time Computer Graphics

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Lab Assessment: Features Tracking for Web-Based AR Application

Web-Based Augmented Reality (AR) is a technology that allows the user to experience AR using the internet connection without any application required. Using HTML file to code our website, we used JavaScript to make sure that the website can work with web-based AR. The JavaScript files that are included in this lab are SimpleImage.js to create an image object, tracking.js to generate feature of the image and threex-arpatternfile.js which is to display the three-dimensional model in web and open the camera.

The web will firstly acquire the user to upload an image which will be read and interpreted by the function uploadimage(). The image will then be processed using updateFullMarkerImage() to generate the pattern for the AR marker. To extract the image features, the image needs to be converted to greyscale using greyscale() and undergo the detectfeature() function to detect the features. Users also can specify the threshold value using the slider provided to see the detection point in the image uploaded. For the pattern to be recognized by the camera, the image will be downloaded using the download button in .patt format so that the camera can use the pattern as the marker to display the object. When the button to call the camera is clicked, the cameratrack.html will be opened and the camera will detect the pattern in the same folder. The cameratrack.html used aframe.js to embed the ar.js, display the 3D model and call the camera. For the 3D object we imported the glb file from the SketchFab and adjusted the scale and position in the a-entity tag.

We have successfully run the lab and have the three patterns detected. We do need to improve our lab in the future because the pattern cannot be replaced automatically in the same path as the camera. As a conclusion, this lab helps us to discover a way for web-based AR tracking.