CS SENIOR CAPSTONE PROBLEM STATEMENT

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CREATING IMMERSIVE EXPERIENCES ON THE WEB USING VR AND AR.

PREPARED BY

GROUP 47

BRANDON MEI

Abstract

This document outlines the problem statement, and proposed solution, for the development of promoting a virtual world experiences hosted through the browser and can be deployed in the OpenSource portal of Intel. While WebVR can already be used today, WebXR will serve as a replacement of WebVR and it will provide more features, better API, and capable of supporting more use case like AR. Virtual reality is one of the cutting edge technologies and a new way to experience the content and utilize it in VR and AR environment. The project will not only be creating immersive experiences on the web but enhancing the UX using virtual reality and augmented reality. This would allow many content creation for a developer using VR/AR technologies in the web browsers and share it with the world. The WebXR device API is able to fully support Firefox, Chrome, and Edge.

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I. Definition and Description of Problem

As improvements in technology and computing, VR and AR are gaining momentum throughout the consumers and enterprise users. The cost of VR and AR solution can be less expensive for a casual-level immersive user. Even as the technology matures and content grows, there are still challenges that needed to be solved to become a fully immersive mainstream. The main challenges of VR and AR are content delivery, which would require a huge amount of download data and other complicated apps installation steps. The virtual and augmented realities companies may spend a large number of resources to just create content, but it didn't expand farther because it was unmanageable for the developers to spread to large markets because of multiple vendors and skills requires. The main idea is to promote VR and AR technologies to have more capabilities on the web platform with less irritation, and entertaining user experiences. In order for virtual and augmented realities to address this issue that application requires low latency, high precision interfaces to have an immersive experience. The WebXR device API provides interfaces to the VR and AR hardware to allow developers to build an enhanced version of the website immediately when they access it with a click of a button. This is an effective solution to the problem as it could potentially have more content creation, low friction, and able to create new development environment to deliver immersive and entertaining experiences, while simultaneously providing students with cutting-edge technology and fun and useful project to develop as their senior capstone project.

II. Proposed Solution

In order for our group to help bring high-performance Virtual Reality and Augmented Reality to the open Web. We need to effectively enhance virtual users content to provide a better VR experience, whether without an advanced VR or AR system. WebVR allows web developers to create an immersive experience through the web browser. As it is built on the main foundation of the web, HTML, JavaScript, and CSS. The WebVR is built in the browser engine. This enables content creation because the web has great scaling and it is easily accessible to millions of internet user instantly. The value of WebVR is it can furthermore enhance users content by providing a better VR and AR experience. In this era of technology, it is necessary to utilize and explore what it might mean to expand WebVR to include AR/MR capabilities. We need to look at the web as a place where the user experience is fluid. The users should able to just click on the URL, and the most recent content appears. There should be no update process and complex steps. The web can reach to many types of compatible devices or operating system. This means it has a great number of perimeters to handle virtual environments. To have a completely immersive experience is to get rid of motion sickness requires VR and AR to trick the brain into thinking that it is in actual reality. This allows the user to become fully immersive in the virtual reality. Our group has met our client and come up several ideas of how we can bring immersive VR and AR to the web. One of the ideas is exploring 01.org content through virtual reality. Then select several projects like Chromium, Linux to map them into a virtual set of rooms to immerse users and plan to find content that could be explained in VR. Another proposed idea is to create a physics simulator in VR so users can play around the tools provided and be immersive in a detail surrounding objects. This can be very educational for developing countries education while being immersed in content. Overall, the main solution is to have a great experience and the UX is immersive that demonstrate the capabilities of the immersive web.

III. Performance Metrics

For this project to be considered a complete and have a successful project, there should be the various criterion that need to be met. The project as a group first has to be decided together for the content and concept as we move during the project. Second is to have a paper prototype to design better UX experiences. For future immersive experience is the WebXR device API. WebXR makes it easier to support many controllers to make the experiences better and more immersive. The web will also need to get some improvements with the WebGL so it will allow developers to create more content for more advanced immersive experiences. To have a better satisfactory UX is to open a way to easily create content and share it with the world. This enables a wide range of creative content of the video, 3D, and social virtual and augmented reality that could bring more immersive experiences to the users. where it can have a virtual reality or augmented reality portal where users with compatible hardware can experience an immersive version of the website when they access it. For example, there should be a compatibility of multiple Virtual and Augmented reality to maintain the seamlessly interactive experience and portability. For more content performance and to introduce a possibility of multiplayer content for more user experience. It is important that our group make an enjoyable VR and AR experience that enhance the web user experience.