Project Statement – Forge API Exploration Project

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Abstract

Group 20’s project branches from an Autodesk prototype project called VRok.it, which is a simple web-based 3D model viewer and mobile virtual reality (VR) explorer. Group 20’s project will expand upon its features and functionalities on a new website, with a focus on utilizing the Forge API. Conventionally, viewing 3D models in VR is a challenge if you have model files on many devices, or have a headset that only works in conjunction with a smartphone. Group 20’s project aims to do this by utilizing a web-based software that uses the Forge API in conjunction with Amazon Web Services. The project will also be expanded with new ideas as the project is developed.

Problem definition

Currently most of the cad software that is available can be expensive to get and can be very difficult to use if you don’t know what you are doing. There is also not a lot of software available that allows users to easily and affordably go between viewing their cad files in a 3D model viewer and on a VR device. With so many smartphones and other devices now supporting VR many more users can afford to take advantage of VR technologies. Each different smartphone and device however can operate at a different optimal specification depending on the hardware that it is using. With so many different devices it is hard to know exactly what a user would be able to display on their specific device. Larger models and models that are very detailed or have many of different parts can take a lot of effort to render in 3D. In turn that would make these models hard to view in a VR environment with a device that doesn’t have a lot of power. Most users don’t want to have to worry about this though and just want the software to make it work for them on which ever device they might have. The user should be able to simply upload any cad file they have and then have it be viewable in a 3D viewer. The software should take the model they uploaded, figure out what device they are trying to use to view it in VR on and alter the model so that it is useable on their device. The software should also be able to let the user know if the model they are trying to view is just too large for the device they are trying to use.

Proposed solution

To accomplish this, we would be working from the vrok.it project that was started by Keam Walmsley. We would use the vrok.it project as the starting point with the goal of making it more accessible for user’s and increase the projects functionality. To make this more accessible we would need to make it so that vrok.it would be able determine what type of devices a user is currently trying to use to view their models in VR. We could use different web services to determine this. After the software knows what device the user will be using it could then begin to determine the different ways in which it could optimize the user’s VR experience. Based on the device that is being used software needs to determine if the model they are trying to view is even possible on that device. One way would we could do this is to have the software check if the model that is being viewed has many internal components that can’t actually be seen by the user in the VR environment. IF this is the case then the software would then remove these components from the model prior to being viewed in VR, increasing the ability of the device to display the model. Then we could have it start checking different resolutions that the model could be displayed at and still have it be viewable by the user. Need to add more here!!!

Performance metrics

When viewing models there should be a good framerate at least 30 fps in order to have a good viewing experience. The finished project must be able to make suggestions on what the users model quality should be based on the device that they are currently using as their VR environment. At the time of the Expo we should be able to demonstrate the full process of uploading different models into the software and viewing them on different types of devices to show that the product works.