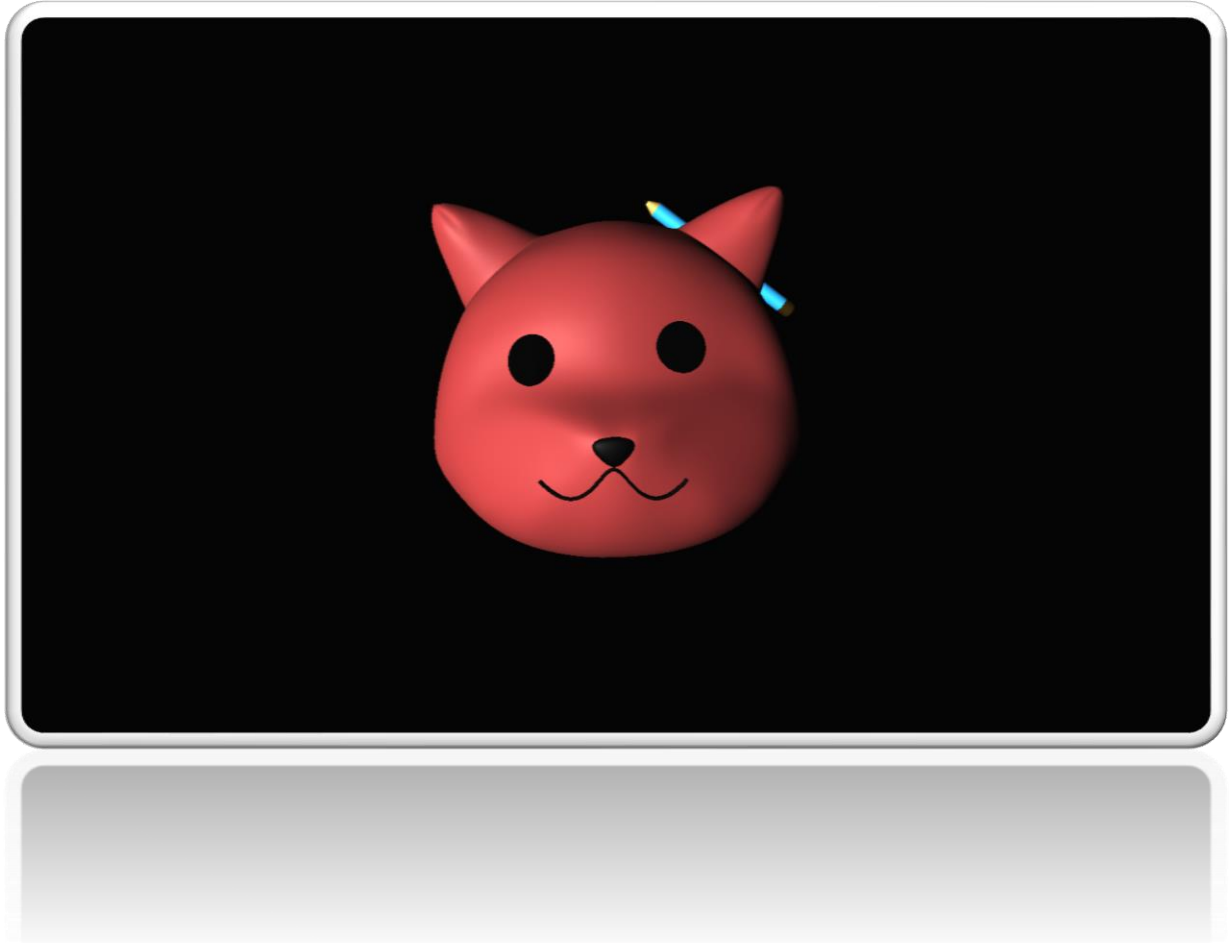# 3D Model and 3D Website

Name: Arianne Xiang

Project: Research voor Sprint-X and Advanced Development

Date: 02-01-2022

Contents

Introduction

I always have curious about how 3D Model and 3D websites are made. So, I decided to challenge myself for making a 3D website. For my Sprint-X project, I want to explore how to make and design a 3D model. For the project "Advanced Development", I want to learn about how to code a 3D Website.

My goal is to make a 3D model of my own logo in Sprint X and to animate this 3D logo with the knowledge I have learned from the project "Advanced Development".

In this document I will explain everything that I have researched during this project time with the method "library research/desk research" from DOT framework.

Advanced Development

JavaScript 3D librabries

Some of the JavaScript 3D libraries and frameworks for making a 3D website are:

- Three.Js
- D3
- Aframe
- Babylon Js
- Zdog

I have chosen for Three.Js.

What is Three.Js?

"Three.Js is a cross-browser JavaScript library/API which is used to create and animate 3D computer graphics to display in a web browser. It's one type of a single JavaScript file and includes features like effects, scenes, cameras, lights, sky, materials, meshes, shaders, animations, and 3D objects. Three.js uses WebGL which is JavaScript API used for rendering interactive 3D and 2D graphics in web browsers without using any plugins. With the use of WebGL, Three.js enables your browser to render smooth 3D animation and being cross-browser, it provides immense leverage of multi-dimensional objects across the web" (Patel, 2018).

Why Three.Js?

According to Ashimi (2020) Three is the most popular and supported by a big community of developers and it is capable on any Browser.

Installation of Three.Js

You can install three.js with npm and modern build tools or a CDN. I have used for my first poc a CDN and my second poc npm, because I want to know how both work and what the difference are.

What is CDN?

"A content delivery network (CDN) refers to a geographically distributed group of servers which work together to provide fast delivery of Internet content. A CDN allows for the quick transfer of assets needed for loading Internet content including HTML pages, JavaScript files, stylesheets, images, and videos. The popularity of CDN services continues to grow, and today the majority of web traffic is served through CDNs, including traffic from major sites like Facebook, Netflix, and Amazon" (Cloudflare, n.d.).

What is npm?

"Npm is the package manager for the Node JavaScript platform. It puts modules in place so that node can find them and manages dependency conflicts intelligently. It is extremely configurable to support a wide variety of use cases. Most commonly, it is used to publish, discover, install, and develop node programs" (npm, n.d.).

NPM install vs pulling from a CDN?

According to experienced frontend developers from the DEV community (2018), using CDN or npm packaging depends on your needs. According to them, using CDN is a quick and cheap way to experiment and to make PoCs. But do not use CDN for important projects, because we can not have control over CDN's resources. On the other hand, npm packaging is more reliable, because it gives you dependency management, source control, static checks / analysis.

Module Bundlers

When I was following a tutorial about Three.Js on Three.Js Journey, this frontend developer said in his video about bundler. So, I have searched on google what a bundler is and why to use it.

What is a bundler?

"A bundler is a tool that puts together all your JavaScript code and its dependencies and throws a new JavaScript output file with everything merged, ready for the web, commonly known as the bundle file" (DEV Community, 2021).

5 most used bundlers are:

- Webpack
- Rollup
- Browserify
- ESBuild
- Parcel

Why to use Webpack?

Before webpack, running JavaScript on web browsers was an issue. Either you could create a script for each functionality, which was hard to scale, or you could choose to use a big *.js file* to store the entire code, which was a big problem in terms of size, readability, and management. These problems can cause for a bad website performance which is not we want for our users. Webpack solved this problem by providing IIFEs for large projects (Habilelabs, 2020).

The reason why I want to use Webpack is because it is the most popular bundlers in 2021 and it is a tool that is required for every frontend developer. I think it is worth to learn about it.

Sprint-X

3D Modeling

Some of the tools for 3D modeling are:

- Blender
- MakeHuman
- SketchUp
- ZBrushCoreMini
- Daz Studio 3D

According to Rosna (2019) Blender is the best fit for me, because:

- It is free.
- It is open sources.
- It runs on any machine
- And there is lots of tutorial on internet to start with, so it is a good fit for beginners.

Interactive 3D models

After making the 3D model in blender, it is time to import it in three.js.

Main (2020) has a tutorial about this. The first step is to export the blender file as gltf or glb file. The second step is to import it in the three.js scene by using the method GLTFLoader(). It is important to import GLTFLoader in your JavaScript file, because it is a hidden class. At last, don't forget your lights, otherwise your model would not be visible.

Conclusion

With this research of creating a 3D website with JavaScript libraries and 3D models with Blender, I have made my goal for Sprint X come true. In this whole research I have thought critically about making the right decision such as using CDN or NPM, why to use Webpack and which software for 3D modeling suits me.

Reference

Ashimi, A. (2020, May 1). *Top 21 JavaScript 3D Library and Frameworks*. Dunebook. Retrieved January 2, 2022, from https://www.dunebook.com/javascript-3d-libraries-and-frameworks/

Chandler, J. (2018, April 14). *Should I install the package or use the CDN?* DEV Community. Retrieved January 2, 2022, from https://dev.to/jessachandler/should-i-install-the-package-or-use-the-cdn--4jia

Cloudflare. (n.d.). *Attention Required! | Cloudflare*. Retrieved January 2, 2022, from https://www.cloudflare.com/learning/cdn/what-is-a-cdn/

DEV Community. (2021, July 9). *JavaScript Bundlers: An in-depth comparative. Is Webpack still the best bundler in 2021?* Retrieved January 2, 2022, from https://dev.to/underscorecode/javascript-bundlers-an-in-depth-comparative-is-webpack-still-the-best-bundler-in-2021-59jk

Habilelabs. (2020, August 4). *Introduction to Webpack — Why do we need it? - Minds Verse*. Medium. Retrieved January 2, 2022, from https://medium.com/habilelabs/introduction-to-webpack-why-do-we-need-it-f9b8d003884d

Main, M. (2020, April 15). *How to Import a 3D Blender Object into a Three.js Project as a glTF File*. Medium. Retrieved January 14, 2022, from https://medium.com/@matthewmain/how-to-import-a-3d-blender-object-into-a-three-js-project-as-a-gltf-file-5a67290f65f2

npm. (n.d.). *npm | npm Docs*. Npmjs. https://docs.npmjs.com/cli/v6/commands/npm/

Patel, P. (2018, January 16). *Why to use ThreeJS in Web application development?* CMARIX. Retrieved January 2, 2022, from https://www.cmarix.com/blog/why-to-use-threejs-in-web-application-development/

Rosna, S. (2019, January 31). *Why use Blender when you're new to 3D modelling? | OptimalBI*. Optimalbi.Com. Retrieved January 14, 2022, from https://optimalbi.com/why-use-blender-when-youre-new-to-3d-modelling/