Software Architecture Description

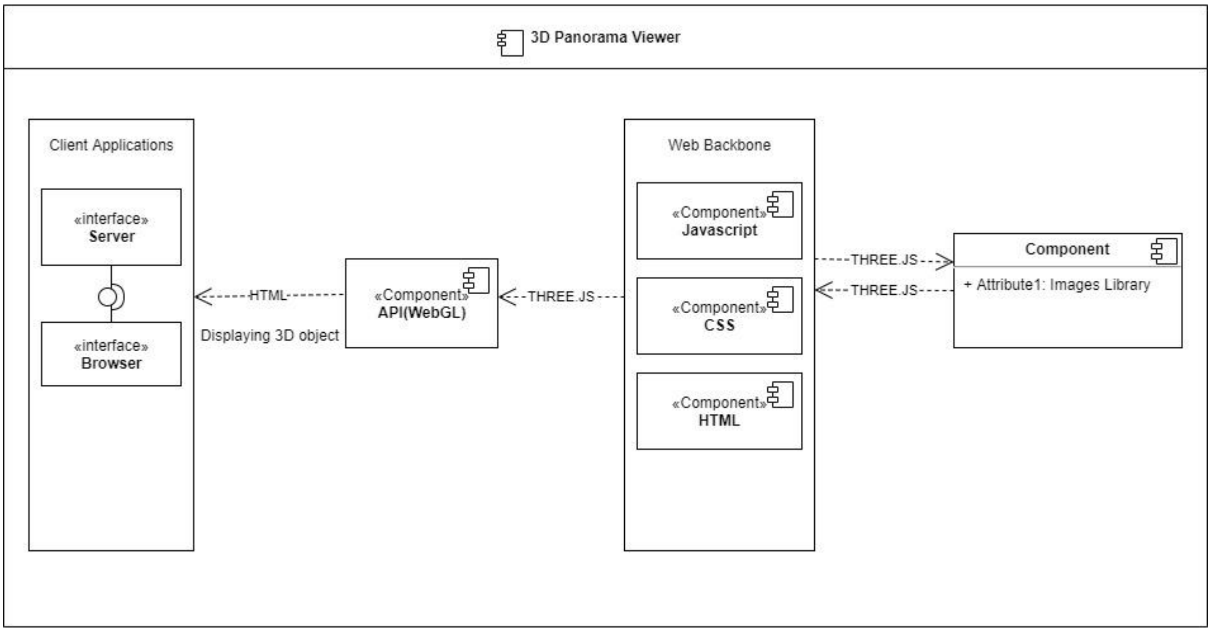
AMOS SS2021

Project – 5 3D Viewer

Architecture Overview

The Architecture overview describes the various components and interfaces within the Software and how they are linked to each other. Below is the description of the Runtime and Code Component.

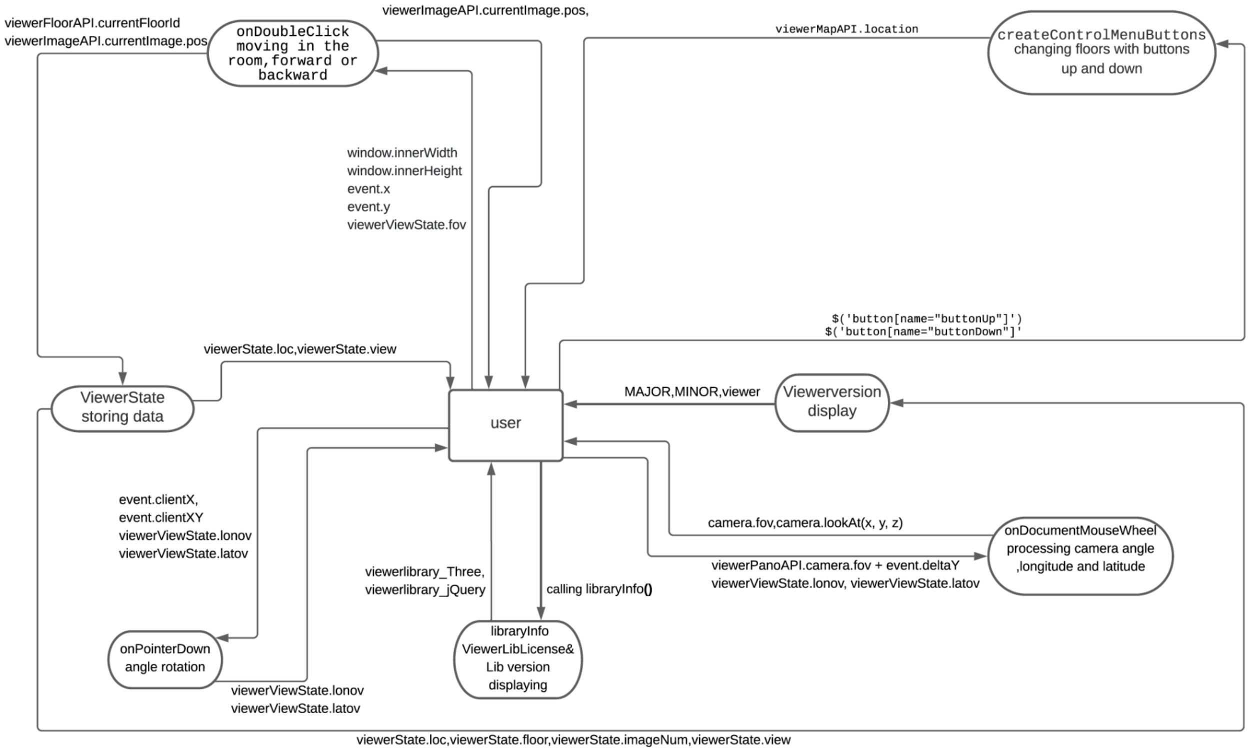
Runtime Components



The runtime component of this project has JavaScript as the programming language. Visual Studio Code which is a free-ware source code editor made by Microsoft for Windows was chosen. The Visual Studio code was used in this instance.However another code editor can be used.The Code editor is linked with Three.js a cross-browser JavaScript library and application programming interface, which is used to create and display animated 3D computer graphics in a web browser using WebGL act as the framework. The source code is hosted in a repository on GitHub. WebGL is the API that allows the images to be displayed.

Cascading Style Sheets (CSS) are used to layout and Structure HTML web pages. Lastly, to be able to visualise the 3D panorama viewer a Live Server which is a Plug-in installed, is used to visualise the various functions of the Software on selected Browser.

Code Components


viewerFloorAPI.currentFloorId
viewerImageAPI.currentImage.pos
onDoubleClick moving in the room,forward or backward
viewerImageAPI.currentImage.pos,
viewerMapAPI.location
createControlMenuButtons changing floors with buttons up and down
window.innerWidth
window.innerHeight
event.x
event.y
viewerViewState.fov
$('button[name="buttonUp"]')
$('button[name="buttonDown"]'
viewerState.loc,viewerState.view
ViewerState storing data
user
MAJOR,MINOR,viewer
Viewerversion display
event.clientX,
event.clientXY
viewerViewState.lonov
viewerViewState.latov
camera.fov,camera.lookAt(x, y, z)
onDocumentMouseWheel processing camera angle ,longitude and latitude
viewerPanoAPI.camera.fov + event.deltaY
viewerViewState.lonov, viewerViewState.latov
viewerlibrary_Three,
viewerlibrary_jQuery
calling libraryInfo()
onPointerDown angle rotation
libraryInfo ViewerLibLicense& Lib version displaying
viewerViewState.lonov
viewerViewState.latov
viewerState.loc,viewerState.floor,viewerState.imageNum,viewerState.view

The ViewerSate class stores data for the viewer. Name of the current floor (viewerState.floor), current image number (viewerState.imageNum), current WGS 84 coordinates(viewerState.loc) and current view (viewerState.view) are obtained from this class.

The onPointerDown function is triggered when moving the panorama. The coordinates of the mouse (event.clientX, event.clientY) and view longitude and latitude (viewerViewState.lonov, viewerViewState.latov) are updated in this function.

Description for a used third-party library and information about license are stored in LibraryInfo.

The onDocumentMouseWheel function updates current view and panorama view characteristics, including longitude, latitude and field of view (lonov, latov, fov).

ViewerVersionAPI Class stores versions of the API and viewer.

Changing the floor is achieved by two HTML buttons and a dropdown menu in the frontend. In the backend, viewerPanoAPI.display and viewerMapAPI.redraw functions are triggered.

Moving between panoramas is achieved by the onDoubleClick and viewerAPI.move functions. The information for the current panorama is updated.

Technology Overview

Technology Stack

Application Software:

- Web Browser

Developing Tools:

- Version Control(SVC): GitHub
- Front end: HTML, CSS, JavaScript
- Back end: JavaScript
- Library: Three.js, jQuery

Description of Developing Tools:

GitHub: An open-source version control platform which allows developers to collaborate with each other by creating their own branches, merging together in the end, tracking the history of all changes made to the code and leaving comments under. Also, you can create Kanban boards, to create user stories which describe the tasks that the developers should fulfill and to monitor the progress of each user story.

HTML: A markup language to describe the structure and information of the website.

CSS: A stylesheet to control the style, font, color and background of the website.

JavaScript: An object-oriented and high-level programming language mostly used in developing websites, which also allows you to use third-party libraries.

jQuery: A JavaScript library used to handle the JSON file which saves the information of our Panorama. In addition, it is a powerful library to create buttons and dropdown lists so that you could combine JavaScript with HTML and CSS easily.

Three.js: A JavaScript library for creating and displaying 3D objects as our goal is to build a 3D Viewer. It is based on WebGL, which is a well-known JavaScript API for interacting with 2D and 3D graphics with high performance and within a compatible web browser.