

SAOV (Satellite Attitude and Orbit Visualization) User Guide

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Section 1: Setting up CesiumJS

(1.1) Installation: All users need a key provided by registering on CesiumJS's site at <https://cesium.com/ion/signup>. Insert the key into the index.html file once the repository is cloned: <https://github.com/AnalyticalGraphicsInc/cesium-workshop>

(1.2) Requirements: Node.js and npm are required to work alongside CesiumJS. The libraries installed into the /cesium-workshop. Use

‘npm install’

to obtain all the dependencies for the project.

*Node.js 10 or greater is required to run this project

Section 2: Running SAOV locally

(2.1) Running locally: First clone the project (From this GitHub link: https://github.com/r3lek/Vue-Nodejs-Socket.io_SeniorDesign) by SSH into your laptop. Move into the directory Vue-Nodejs-Socket.io_SeniorDesign and run the following commands:

Clean the npm cache:

‘npm cache clean --force’

Install all the required libraries. To make sure there are no build errors on the next step:

‘npm install’

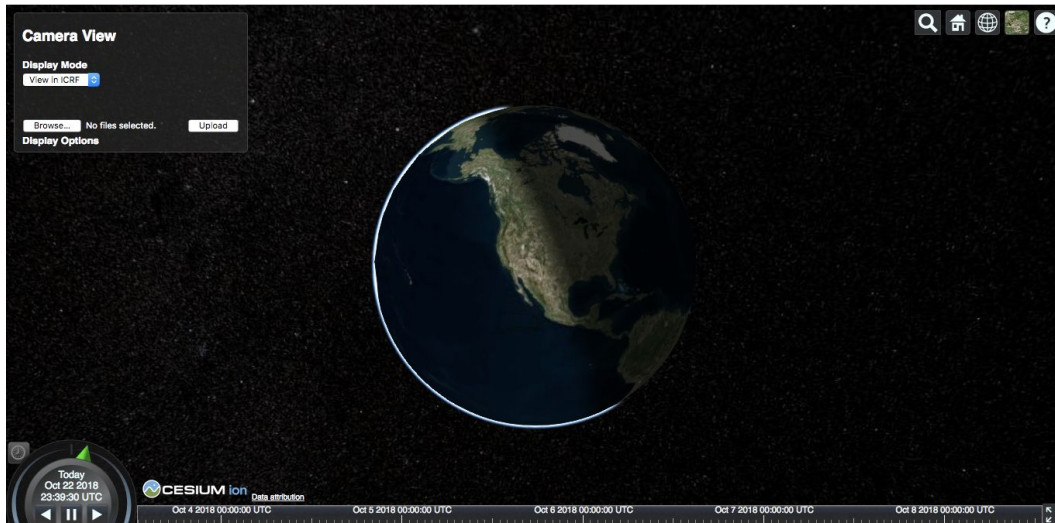
Then to run the software locally:

‘npm run build’

Once successfully built, enter

`'npm run start'`

It should look like the following when accessing <http://localhost:4042>:



Section 3: Deployment of SAOV on a Server

(3.1) Deployment: First, transfer the necessary files (From this GitHub link:

https://github.com/r3lek/Vue-Nodejs-Socket.io_SeniorDesign) by SSH into the server. Within your server and within the directory of Vue-Nodejs-Socket.io_SeniorDesign, type in the command

`'npm cache clean --force'`

to install all the required libraries. To make sure there are no build errors on the first attempt run

`'npm install'`

first and then

`'npm run build'`

It should look like the following when accessing the configured web address for the application:



Our current build (subject to change)

Section 4: How to use the SAOV

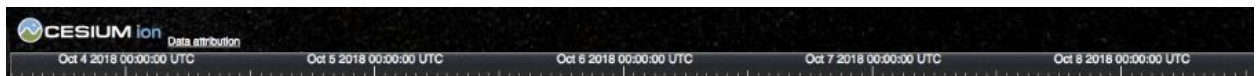
(4.1) Initial Startup

The software is to be used exclusively for TLEs. Select your TLE by clicking on the browse button and upload your TLE. The website will automatically update the visual with a view of the satellite path (the load time varies on machine). The visual can be given two different, but similar views: ICRF allows the Earth to rotate, while ECI provides a static view of the Earth.

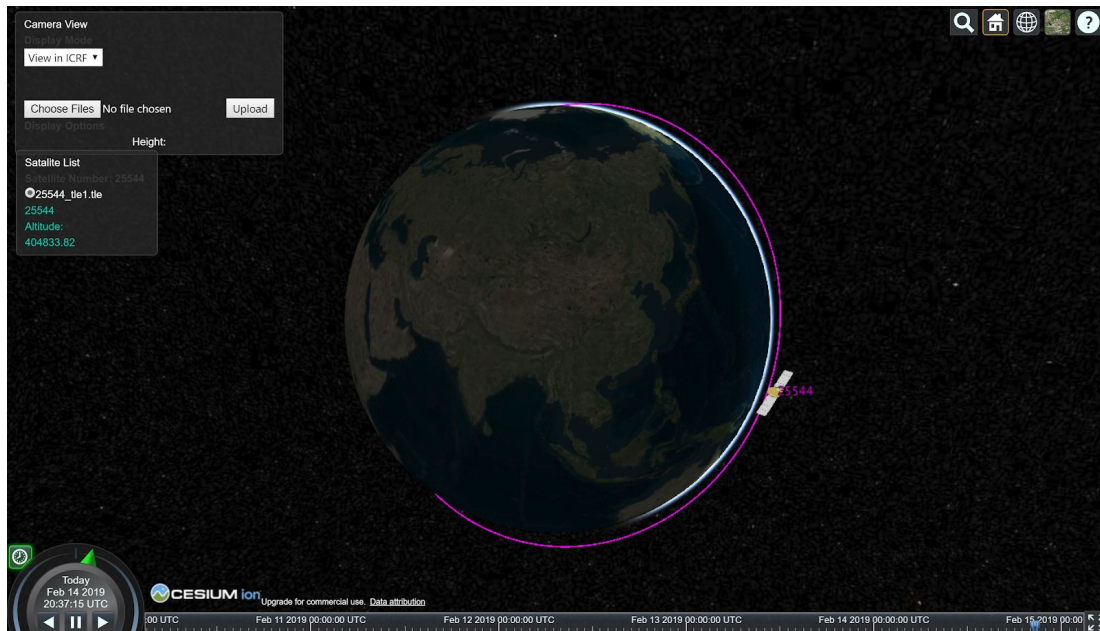
(4.2) Using the SAOV: The bottom-left arrow on the dial is used to speed up (right) and slow down (left) time.



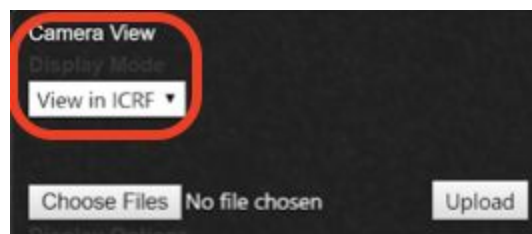
The timeline down below with the dates also serves as a scrubber; where the user can jump from a specific time when clicking and dragging on it.



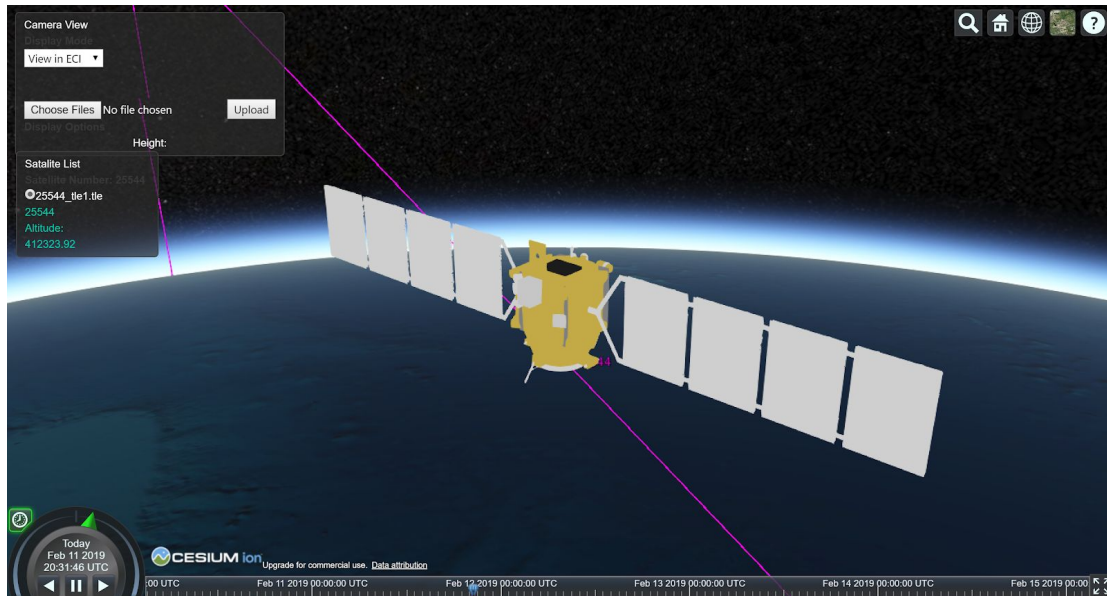
The TLE will only display the satellite path for the data provided and, once the time interval is done (Only up to 3 to 5 days), the path resets to its initial position.



The SAOV is also capable of zooming in on the satellite. First change the ‘Camera View’ to ‘View in ECI’,



then double clicking on the satellite allows the user to have a closer view of the satellite’s orientation at the TLE’s given time.



Press the 'Home' icon to reset the view and exit satellite view mode. Press the 'Globe' icon to see the orbit in a flat orientation of the Earth or in a spherical orientation.

