

## 9. Introducción a Cesium



### Recursos Cesium JS

- Web <https://cesiumjs.org/>
- API <https://cesiumjs.org/refdoc/>
- Ejemplos <https://cesiumjs.org/Cesium/Build/Apps/Sandcastle/index.html>
- Definición [https://en.wikipedia.org/wiki/Virtual\\_globe](https://en.wikipedia.org/wiki/Virtual_globe)
- Tutoriales

<http://cesiumjs.org/tutorials.html> <http://cesiumjs.org/demos.html> <http://developer.digitalglobe.com/docs/maps-api/integration-examples/maps-apicesium-js/> <http://cesiumjs.org/Cesium/Apps/Sandcastle/index.html>

- Videos <https://www.youtube.com/watch?v=ELYsCn-caXY> [https://www.youtube.com/watch?v=YZ\\_2T6dgSw4](https://www.youtube.com/watch?v=YZ_2T6dgSw4) <https://www.youtube.com/watch?v=S745qetDaCc> <https://www.youtube.com/watch?v=IhzYRnNYmwo>

### Descripción

Cesium JS es una librería basada en WebGL, creada por la empresa AGI, que permite trabajar con globos virtuales 3D. Cesium destaca por haber creado de forma abierta las especificaciones de : *Formato GLTF* Especificación 3D Vector-Tiles

## ¿Cómo empezar?

- Nos damos de alta en <https://cesium.com/ion/signup?gs=true>
- Copiamos nuestro token `Access Tokens`

## Mapa básico

- Creamos **cesium-basico.html** dentro directorio geoweb Ejemplo básico :

```

<html lang="es">
<head>
  <title>Ejemplo 0 Cesium básico</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <meta name="author" content="autor" />
  <meta name="description" content="descripción página">
  <meta name="robots" content="index,follow">
  <script src="https://cesiumjs.org/releases/1.53/Build/Cesium/
Cesium.js"></script>
  <link href="https://cesiumjs.org/releases/1.53/Build/Cesium/
Widgets/widgets.css" rel="stylesheet">
  <style>
    #map {
      position: absolute;
      top: 0;
      left: 0;
      height: 100%;
      width: 100%;
      margin: 0;
      overflow: hidden;
      padding: 0;
    }

    body {
      padding: 0;
      margin: 0;
      overflow: hidden;
      height: 100%;
    }
  </style>
  <script>
    function Init() {
      Cesium.Ion.defaultAccessToken =
'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJqdGkiOiI2ZjVkZDdjMC0zNWNjLTFs8YmqoAXwQTr-dT-CCQkGxe5jk_8b6xFUd1VxgY';
      map = new Cesium.Viewer('map');

      //add Properties

      /*
      map.camera.flyTo({
        destination :
Cesium.Cartesian3.fromDegrees( 2.1806,41.4003, 15000)
      });

```

```
        */  
    };  
    </script>  
</head>  
<body onload="Init()">  
    <div id="map"></div>  
</body>  
</html>
```

## Mapa personalizado

- Creamos **cesium-personalizado.html**

```

<html lang="es">

<head>
  <title>Ejemplo 0 Cesium básico</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <meta name="author" content="autor" />
  <meta name="description" content="descripción página">
  <meta name="robots" content="index,follow">
  <script src="https://cesiumjs.org/releases/1.53/Build/Cesium/
Cesium.js"></script>
  <link href="https://cesiumjs.org/releases/1.53/Build/Cesium/
Widgets/widgets.css" rel="stylesheet">
  <style>
    #map {
      position: absolute;
      top: 0;
      left: 0;
      height: 100%;
      width: 100%;
      margin: 0;
      overflow: hidden;
      padding: 0;
    }

    body {
      padding: 0;
      margin: 0;
      overflow: hidden;
      height: 100%;
    }
  </style>
  <script>
    function Init() {
      Cesium.Ion.defaultAccessToken =

'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJqdGkiOiI2ZjVkZDdjMC0zNWNjLTFs8YmqoAXwQTr-dT-CCQkGxe5jk_8b6xFUd1VxgY';
      map = new Cesium.Viewer('map', {

        imageryProvider: new
Cesium.ArcGisMapServerImageryProvider({
          url: '///services.arcgisonline.com/ArcGIS/rest/
services/World_Imagery/MapServer/',
        }),

```

```

        timeline: false,
        navigationHelpButton: true,
        scene3DOnly: true,
        fullscreenButton: true,
        baseLayerPicker: false,
        homeButton: false,
        infoBox: true,
        sceneModePicker: false,
        animation: false,
        geocoder: false,
        sceneMode: Cesium.SceneMode.SCENE3D,
        terrainProvider: Cesium.createWorldTerrain()

    });

    map.camera.flyTo({
        destination: Cesium.Cartesian3.fromDegrees(2.1806,
41.4003, 15000),
        orientation: {
            pitch: Cesium.Math.toRadians(-45.0)
        },
    });
};
</script>
</head>

<body onload="Init()">
    <div id="map"></div>
</body>

</html>

```

## Mapa con datos externos GeoJSON

- Creamos **cesium-ruta.html**



```

<html lang="es">

<head>
  <title>Ruta cesium</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <meta name="author" content="autor" />
  <meta name="description" content="descripción página">
  <meta name="robots" content="index,follow">
  <script src="https://cesiumjs.org/releases/1.53/Build/Cesium/
Cesium.js"></script>
  <link href="https://cesiumjs.org/releases/1.53/Build/Cesium/
Widgets/widgets.css" rel="stylesheet">
  <style>
    #map {
      position: absolute;
      top: 0;
      left: 0;
      height: 100%;
      width: 100%;
      margin: 0;
      overflow: hidden;
      padding: 0;
    }

    body {
      padding: 0;
      margin: 0;
      overflow: hidden;
      height: 100%;
    }
  </style>
  <script>
    function Init() {
      Cesium.Ion.defaultAccessToken =

'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJqdGkiOiI2ZjVkZDdjMC0zNWNjLTFs8YmqoAXwQTr-dT-CCQkGxe5jk_8b6xFUd1VxgY';
      map = new Cesium.Viewer('map', {

        imageryProvider: new
Cesium.ArcGisMapServerImageryProvider({
          url: '///services.arcgisonline.com/ArcGIS/rest/
services/World_Imagery/MapServer/',
        }),

```

```

        timeline: false,
        navigationHelpButton: true,
        scene3DOnly: true,
        fullscreenButton: true,
        baseLayerPicker: false,
        homeButton: false,
        infoBox: true,
        sceneModePicker: false,
        animation: false,
        geocoder: false,
        sceneMode: Cesium.SceneMode.SCENE3D,
        terrainProvider: Cesium.createWorldTerrain()

    });

    GPX_lyr = Cesium.GeoJsonDataSource.load('datos/
ruta.geojson', {
        stroke: Cesium.Color.RED,
        strokeWidth: 3,
        clampToGround: true
    });

    GPX_lyr.then(function (dataSource) {
        map.dataSources.add(dataSource);
        map.flyTo(dataSource);
    });

    };
</script>
</head>

<body onload="Init()">
    <div id="map"></div>
</body>

</html>

```

## Mapa Cesium con Mapbox y/o ICGC

- Creamos **cesium-mapbox-icgc.html**

```

<html lang="es">

<head>
  <title>Ejemplo 0 Cesium básico</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <meta name="author" content="autor" />
  <meta name="description" content="descripción página">
  <meta name="robots" content="index,follow">
  <script src="https://cesiumjs.org/releases/1.53/Build/Cesium/
Cesium.js"></script>
  <link href="https://cesiumjs.org/releases/1.53/Build/Cesium/
Widgets/widgets.css" rel="stylesheet">
  <style>
    #map {
      position: absolute;
      top: 0;
      left: 0;
      height: 100%;
      width: 100%;
      margin: 0;
      overflow: hidden;
      padding: 0;
    }

    body {
      padding: 0;
      margin: 0;
      overflow: hidden;
      height: 100%;
    }
  </style>
  <script>
    function Init() {

      var imageReference = new
Cesium.UrlTemplateImageryProvider({
        url: 'https://api.mapbox.com/styles/v1/
gismasterm2/cjqg9p2lm00442rqm4v1k89rt/tiles/256/{z}/{x}/{y}@2x?
access_token=pk.eyJ1Ijoiz2lzbWZkdGVybTIIiLCJhIjoieY2plZHHubTQxMTNoYzMza
SsA'

      });

    /*

```

```

        var imageReference=new
Cesium.createOpenStreetMapImageryProvider({
    url: 'https://geoserveis.icgc.cat/
icc_mapesmultibase/noutm/wmts/orto/GRID3857/',
    fileExtension: 'jpeg',
    maximumLevel: 19,
    credit: 'Institut Cartogràfic i Geològic de
Catalunya'
});

*/

Cesium.Ion.defaultAccessToken =

'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJqdGkiOiI2ZjVkZDdjMC0zNWNjLTFs8YmqoAXwQTr-dT-CCQkGxe5jk_8b6xFUd1VxgY';
    map = new Cesium.Viewer('map', {

        imageryProvider: imageReference,
        timeline: false,
        navigationHelpButton: true,
        scene3DOnly: true,
        fullscreenButton: true,
        baseLayerPicker: false,
        homeButton: false,
        infoBox: true,
        sceneModePicker: false,
        animation: false,
        geocoder: false,
        sceneMode: Cesium.SceneMode.SCENE3D,
        terrainProvider: Cesium.createWorldTerrain()

    });

    map.camera.flyTo({
        destination: Cesium.Cartesian3.fromDegrees(2.1806,
41.4003, 15000),
        orientation: {
            pitch: Cesium.Math.toRadians(-45.0)
        },
    });
};
</script>
</head>

<body onload="Init()">
    <div id="map"></div>
</body>

```

```
</html>
```

## Mapa con capas

- Creamos **cesium-capas.html**

```

<html lang="es">
<head>
  <title>Ejemplo extra</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <meta name="author" content="autor" />
  <meta name="description" content="descripción página">
  <meta name="robots" content="index,follow">
  <script src="https://cesiumjs.org/releases/1.53/Build/Cesium/
Cesium.js"></script>
  <link href="https://cesiumjs.org/releases/1.53/Build/Cesium/
Widgets/widgets.css" rel="stylesheet">
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/
3.2.1/jquery.min.js"></script>
  <style>
    #map {
      position: absolute;
      top: 0;
      left: 0;
      height: 100%;
      width: 100%;
      margin: 0;
      overflow: hidden;
      padding: 0;
    }

    body {
      padding: 0;
      margin: 0;
      overflow: hidden;
      height: 100%;
    }

    html {
      height: 100%;
    }

    #capas {
      position: absolute;
      top: 10px;
      left: 10px;
      z-index: 1000;
      width: auto;
      height: auto;
    }
  </style>

```



```

        background-color: white;
    }

    li {
        list-style-type: none;
    }

    ul {
        padding: 10px !important
    }
</style>
<script>
    function Init() {

        var imageReference = new
Cesium.UrlTemplateImageryProvider({
            url: 'https://api.mapbox.com/styles/v1/
gismasterm2/cjqq9p2lm00442rqm4vlk89rt/tiles/256/{z}/{x}/{y}@2x?
access_token=pk.eyJ1IjoiZ2lzbWFzdGVybTIiLCJhIjoiY2plZHhubTQxMTNoYzMza
SsA'

        });

        Cesium.Ion.defaultAccessToken =

'eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJqdGkiOiI2ZjVkZDdjMC0zNWNjLTF
s8YmqoAXwQTr-dT-CCQkGxe5jk_8b6xFUd1VxgY';
        map = new Cesium.Viewer('map', {

            imageryProvider: imageReference,
            timeline: false,
            navigationHelpButton: true,
            scene3DOnly: true,
            fullscreenButton: true,
            baseLayerPicker: false,
            homeButton: false,
            infoBox: true,
            sceneModePicker: false,
            animation: false,
            geocoder: false,
            sceneMode: Cesium.SceneMode.SCENE3D,
            terrainProvider: Cesium.createWorldTerrain()

        });

        map.camera.flyTo({
            destination: Cesium.Cartesian3.fromDegrees(2.1806,

```

```

41.4003, 15000),
    orientation: {
        pitch: Cesium.Math.toRadians(-45.0)
    },
});

var overlay = map.imageryLayers;

var ortoICGC = overlay.addImageryProvider(new
Cesium.createOpenStreetMapImageryProvider({
url: 'https://geoserveis.icgc.cat/icc_mapesmultibase/noutm/wmts/
orto/GRID3857/',
fileExtension: 'jpeg',
maximumLevel: 19,
credit: 'Institut Cartogràfic i Geològic de Catalunya'
}));
ortoICGC.show = false;

var topoICGC = overlay.addImageryProvider(new
Cesium.createOpenStreetMapImageryProvider({
url: 'https://geoserveis.icgc.cat/icc_mapesmultibase/noutm/wmts/
topo/GRID3857/',
fileExtension: 'jpeg',
maximumLevel: 19,
credit: 'Institut Cartogràfic i Geològic de Catalunya'
}));
topoICGC.show = false;

var topo2ICGC = overlay.addImageryProvider(new
Cesium.createOpenStreetMapImageryProvider({
url: 'https://tilemaps.icgc.cat/mapfactory/wmts/topo_suau/
CAT3857/',
fileExtension: 'png',
maximumLevel: 19,
credit: 'Institut Cartogràfic i Geològic de Catalunya'
}));
topo2ICGC.show = false;

var orto46 = overlay.addImageryProvider(new
Cesium.createOpenStreetMapImageryProvider({
url: 'https://tilemaps.icgc.cat/mapfactory/wmts/orto46/CAT3857/',
fileExtension: 'png',
maximumLevel: 17,
credit: 'Institut Cartogràfic i Geològic de Catalunya'
}));
orto46.show = false;
2
$('.chk_capes').on('click', function() {

```

```

var layer = $(this).val();
var estado = $(this).prop('checked');

if (layer == 'ortoICGC') {
    ortoICGC.show = estado;
} else if (layer == 'topoICGC') {
    topoICGC.show = estado;

} else if (layer == 'topo2ICGC') {
    topo2ICGC.show = estado;

} else if (layer == 'orto46') {
    orto46.show = estado;
}

}); //fin onclick

    };
</script>
</head>

<body onload="Init()">
    <div id="capas">
        <ul>
            <li>Capas</li>
            <li>
                <input type="checkbox" value="ortoICGC"
class="chk_capes"> ortoICGC
            </li>
            <li>
                <input type="checkbox" value="topoICGC"
class="chk_capes"> topoICGC
            </li>
            <li>
                <input type="checkbox" value="topo2ICGC"
class="chk_capes"> topo2ICGC
            </li>
            <li>
                <input type="checkbox" value="orto46"
class="chk_capes"> orto46
            </li>

        </div>
        <div id="map"></div>
    </body>

</html>

```