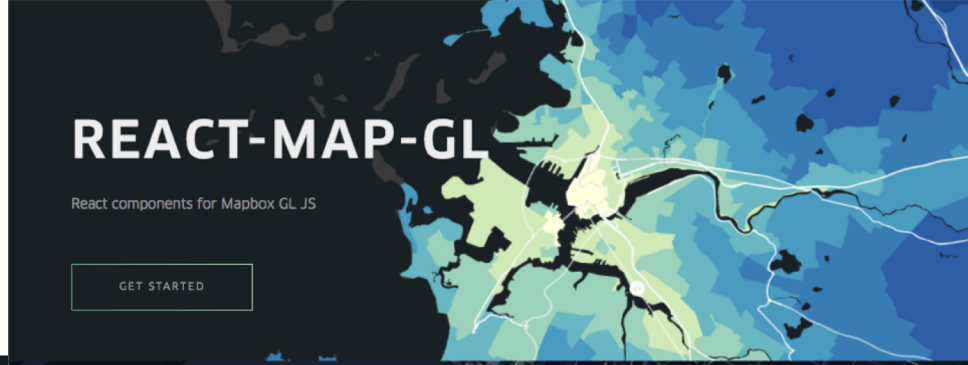
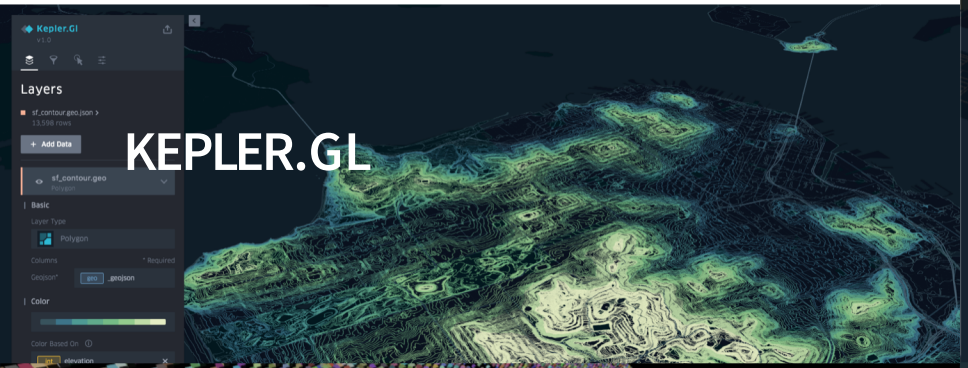
glTF in Big Data Visualization

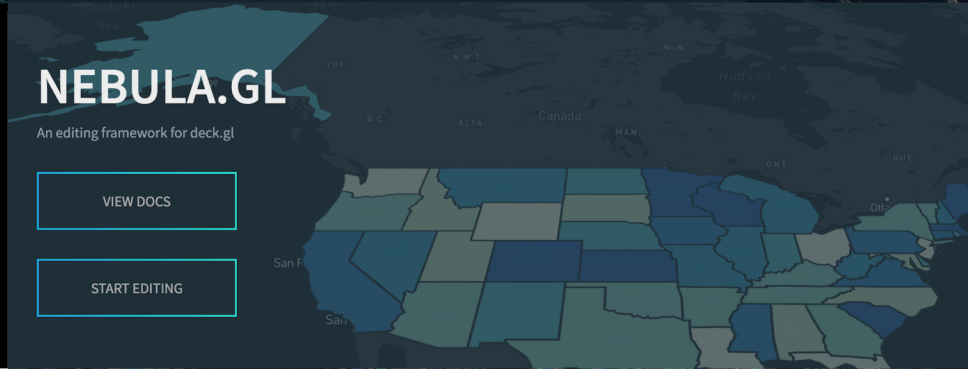
Uber

Our Frameworks

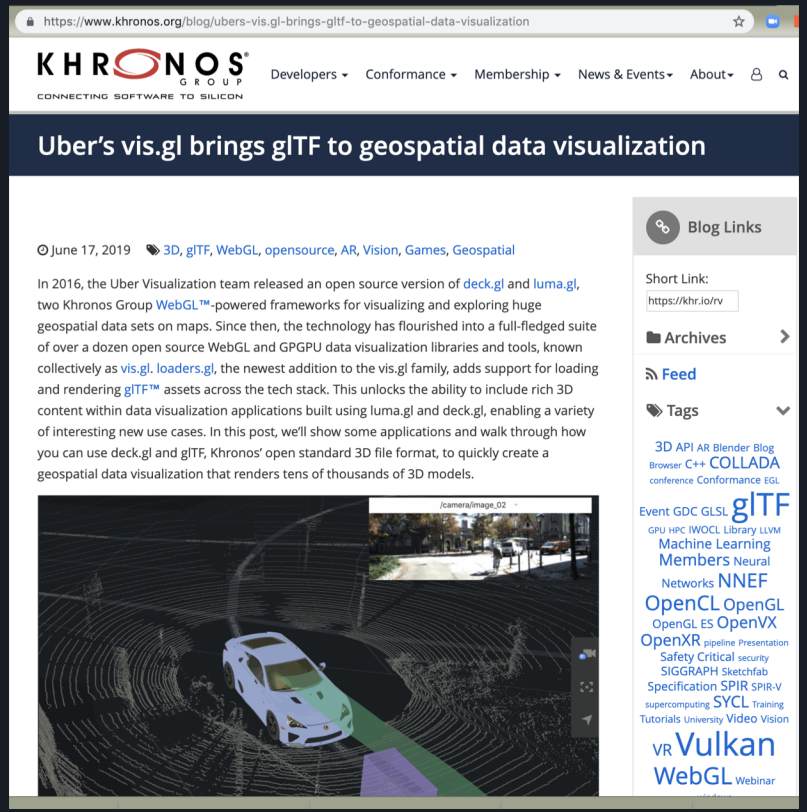
A suite of open-source visualization frameworks





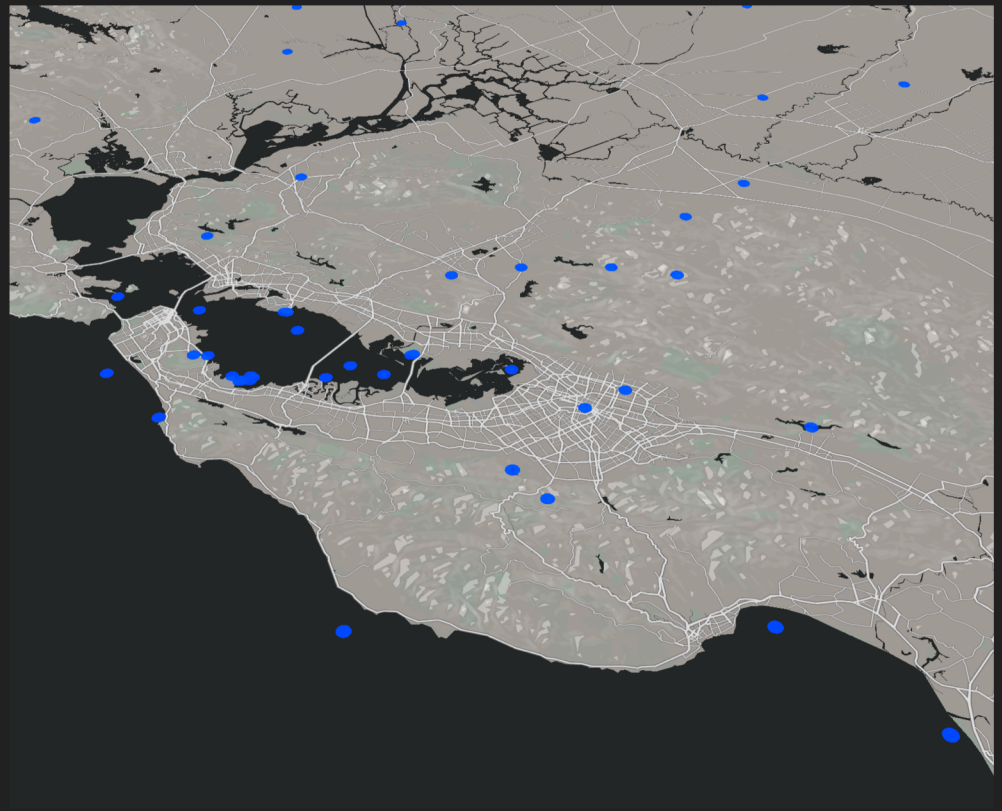


glTF support available throughout the vis.gl stack!

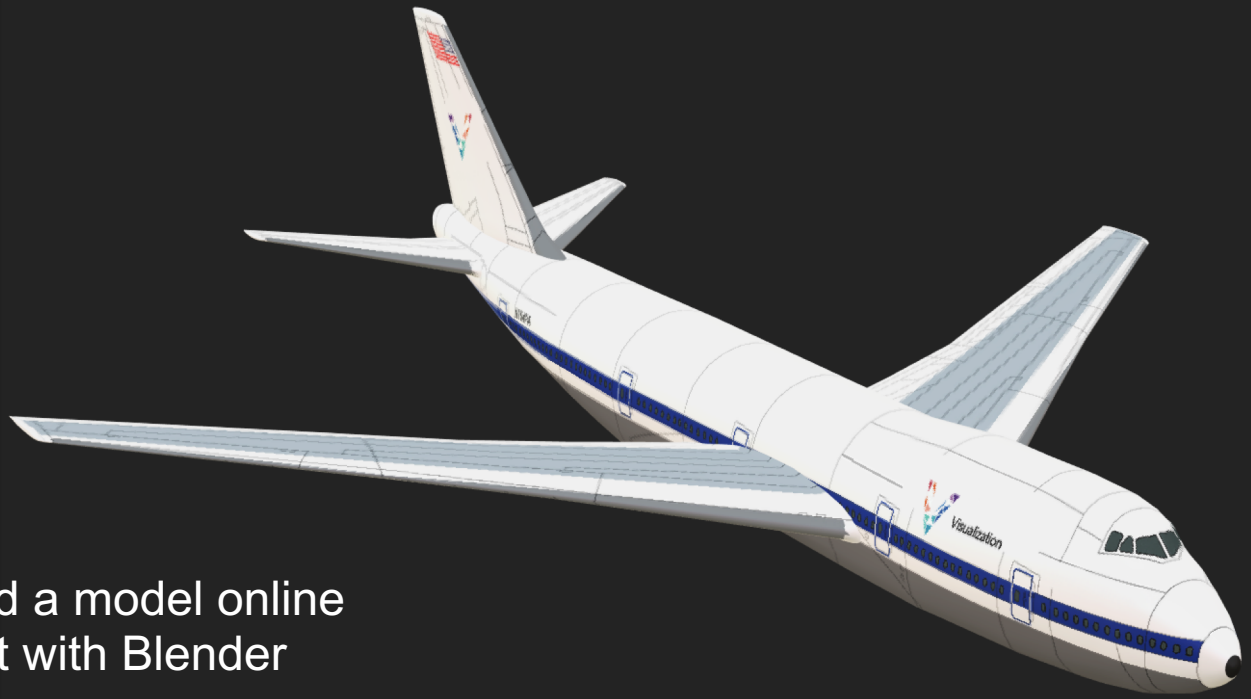


Visualizing Big Data without glTF

- Lines, points or circles
- Not obvious what they represent



Visualizing Big Data with glTF: Model Selection



- Find a model online
- Edit with Blender

Visualizing Big Data with glTF

Adding glTF support to luma.gl

- Reference PBR Shader

- luma.gl modular shader
  - Works with geo-coordinate projection system

- Khronos glTF Sample Viewer

- luma.gl code

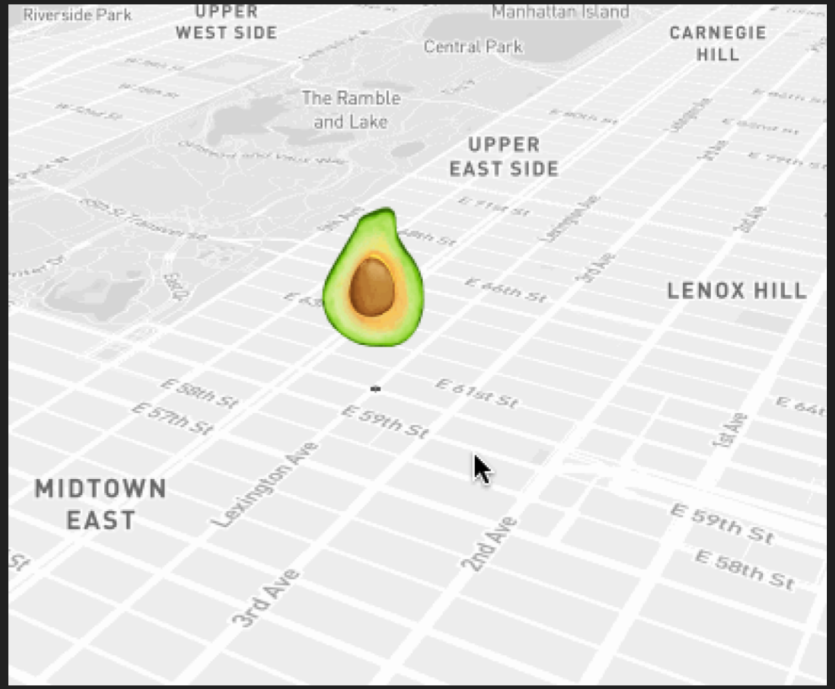
Adding glTF support to luma.gl: Benefits

- Advanced photorealistic rendering with very little effort
- Consistent visuals with other frameworks
- Allows us to do pixel-to-pixel comparisons of rendering to verify correct rendering

Editing & More...

- Last year we open-sourced nebula.gl
- We combine editing with glTF
- Only ~80 lines of code for this demo

- Future plans: WebVR



LOADERS.GL

Framework Agnostic Loaders for Data Visualization

GET STARTED

The need for a portable glTF parser...

- Rendering glTF was “easy”, thanks to the Khronos PBR reference implementation
- Parsing the glTF data required more effort
- All the resulting parsing code was “WebGL Framework Independent”
- Wouldn’t it be great if there was also a reference implementation for this?

yarn add @loaders.gl/gltf

```
import {load} from '@loaders.gl/core';
import {GLTFLoader} from '@loaders.gl/gltf';
const gltf = await load(url, GLTFLoader);
```

- Returns a javascript object with **typed array** views into the binary chunk
- Optionally decodes and removes Draco encoded meshes

A Growing Family of Framework-Independent loaders

GLTF Loaders

@loaders.gl/gltf
@loaders.gl/draco

Point Cloud Loaders

@loaders.gl/laz
@loaders.gl/pcd
@loaders.gl/ply
@loaders.gl/obj

Other Loaders

@loaders.gl/csv
@loaders.gl/arrow
@loaders.gl/zip
@loaders.gl/kml
...

Some loaders are forks from other open source projects, some are newly written.

Loaders: a way to increase community collaboration?

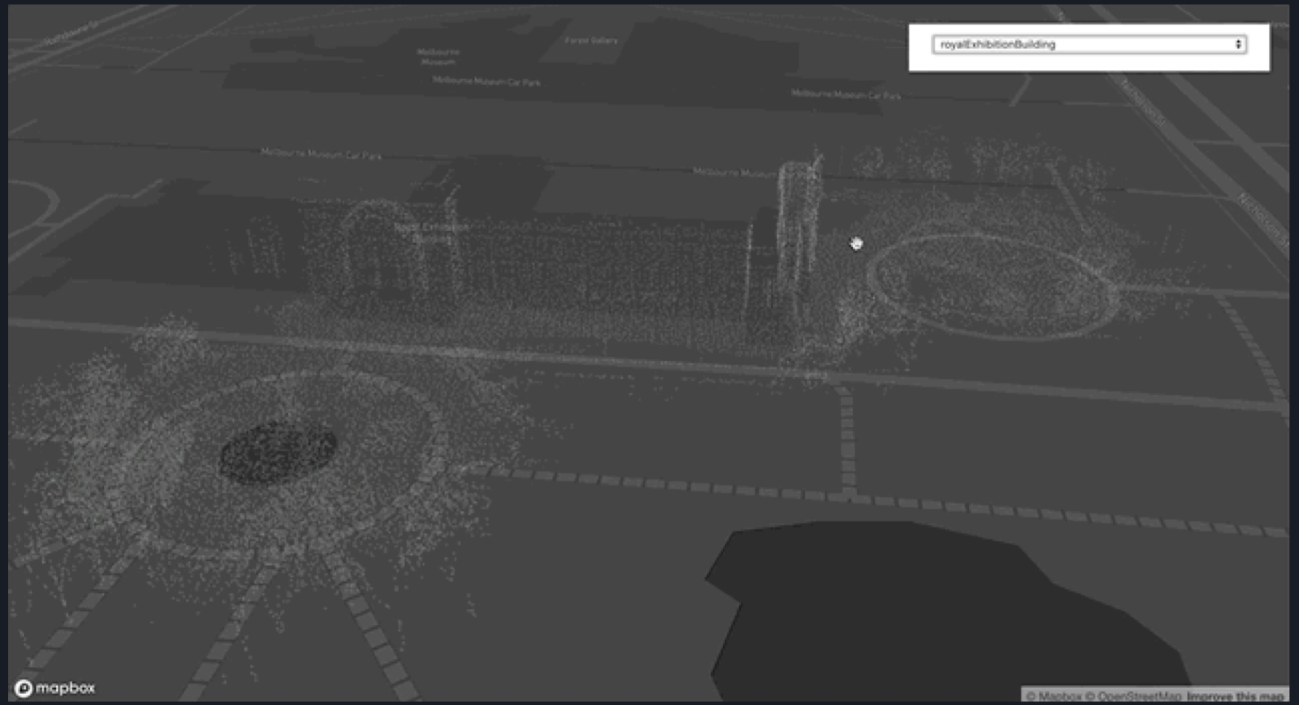
- WebGL will likely remain a multi-framework world
- This is great as it promotes innovation
- But the price is duplication of effort
- If not addressed, our WebGL frameworks will be less innovative and unique
- Can we factor out common WebGL frameworks parts and make them reusable?

First loaders.gl collaboration!

@loaders.gl/3d-tiles: A portable implementation of the 3D Tiles standard

Both Uber and Cesium engineers contributing

Uses both **@loaders.gl/gltf** and **@loaders.gl.draco** for 3D model and point tiles



Point Cloud of the Royal Exhibition Hall in Melbourne

18M points** in 600+ 3D tiles loaded by **Tileset3DLoader,** rendered by **Tile3DLayer

We are Looking for Potential Users / Partners!

Yes, that means you!