

Visualizing GPS tracks with RikiTraki



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RikiTraki

163

What's New...

- Francis Shrader Old Growth Trail, near Gold Beach, Oregon
- Trillium Falls, near Orick, California
- Boardman Park, near Brookings, Oregon
- Umpqua Dunes, near Reedsport, Oregon
- Kentucky Falls, near Eugene, Oregon

120

6

2

9

18

8

3000 km
2000 mi

Leaflet | Tiles © Esri — Source: ArcGIS World Topographic Map

The screenshot shows the RikiTraki website interface. At the top, there's a navigation bar with the RikiTraki logo, a search bar, and social media icons. Below this is a world map with several colored circular markers indicating locations: an orange marker with '120' in North America, green markers with '6', '2', and '9' in South America, a yellow marker with '18' in Europe, and a green marker with '8' in Southeast Asia. A sidebar on the right titled 'What's New...' lists five recent updates, each with a small image and a text description. At the bottom left, there's a scale bar for 3000 km and 2000 mi. At the bottom right, there's a copyright notice for Leaflet and Esri.

[View recorded demo in YouTube](#)

Built on top of a great Open Source foundation...



Single Page Client

Web Services

Database

...with awesome open source components

Leaflet-omnivore	Parsing GPX files
Leaflet.Elevation	Visualizing elevation profiles
Leaflet.markercluster	Visualizing marker groups
Lightbox2	Displaying slide shows
exif-js	Reading exif data
passport	Authentication for nodejs
bcryptjs	Password hashing
jsonwebtoken	JWS token handling
is-my-json-valid	JSON schema validation
javascript-state-machine	Finite state machine μ -framework

It's like having a huge team in your project!

...and open data + free services

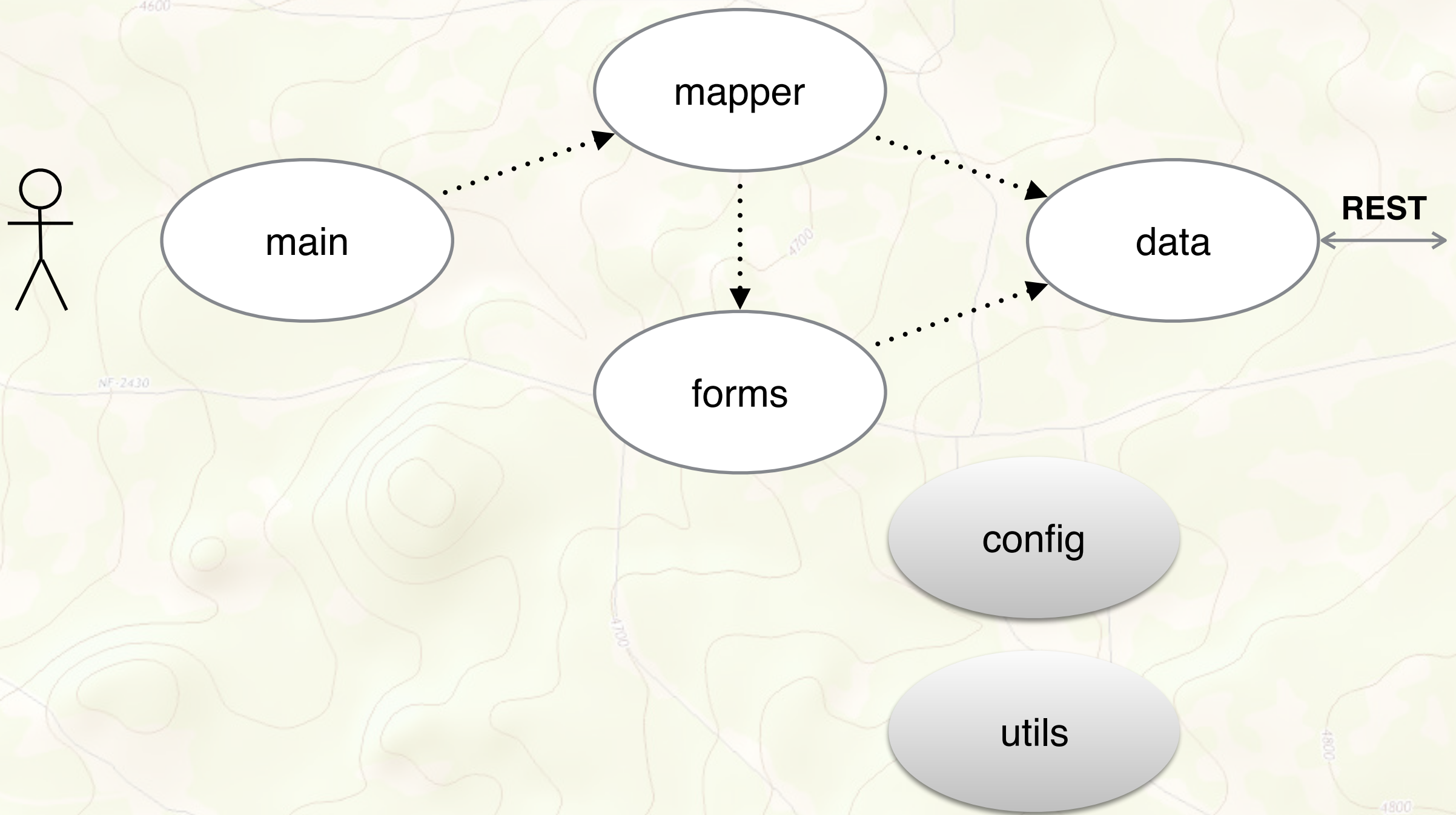


GitHub

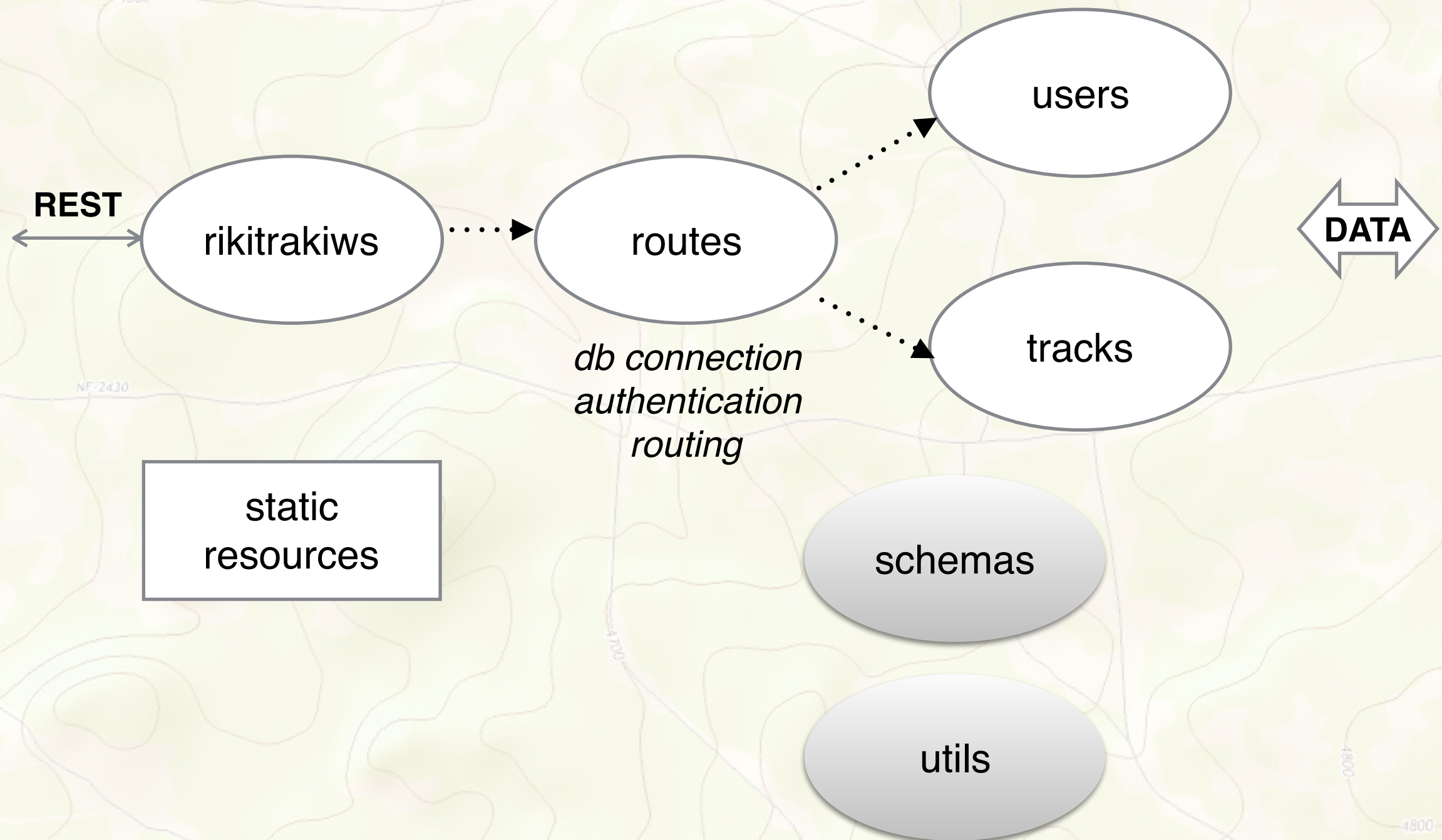


Gratis, zero, zilch, nada!

The client



The web services



Track playback in Cesium using CZML

In function buildCZMLForTrack...

```
var trackCZML = [
  {
    id: 'document',
    name: 'Track CZML',
    version: '1.0',
    clock: {...}
  },
  {
    id: 'track',
    availability: ...,
    path : {...},
    billboard: {...},
    position: {...}
  }
];
```

The time range of the track
 The path to draw as time passes
 The leading shape of the path
 Time + coordinate list

In mapper...

```
viewer.dataSources.add(
  Cesium.CzmlDataSource.load(
    tmUtils.buildCZMLForTrack(
      trackGeoJSON,...)).then(function(ds){...}));
```

On play...

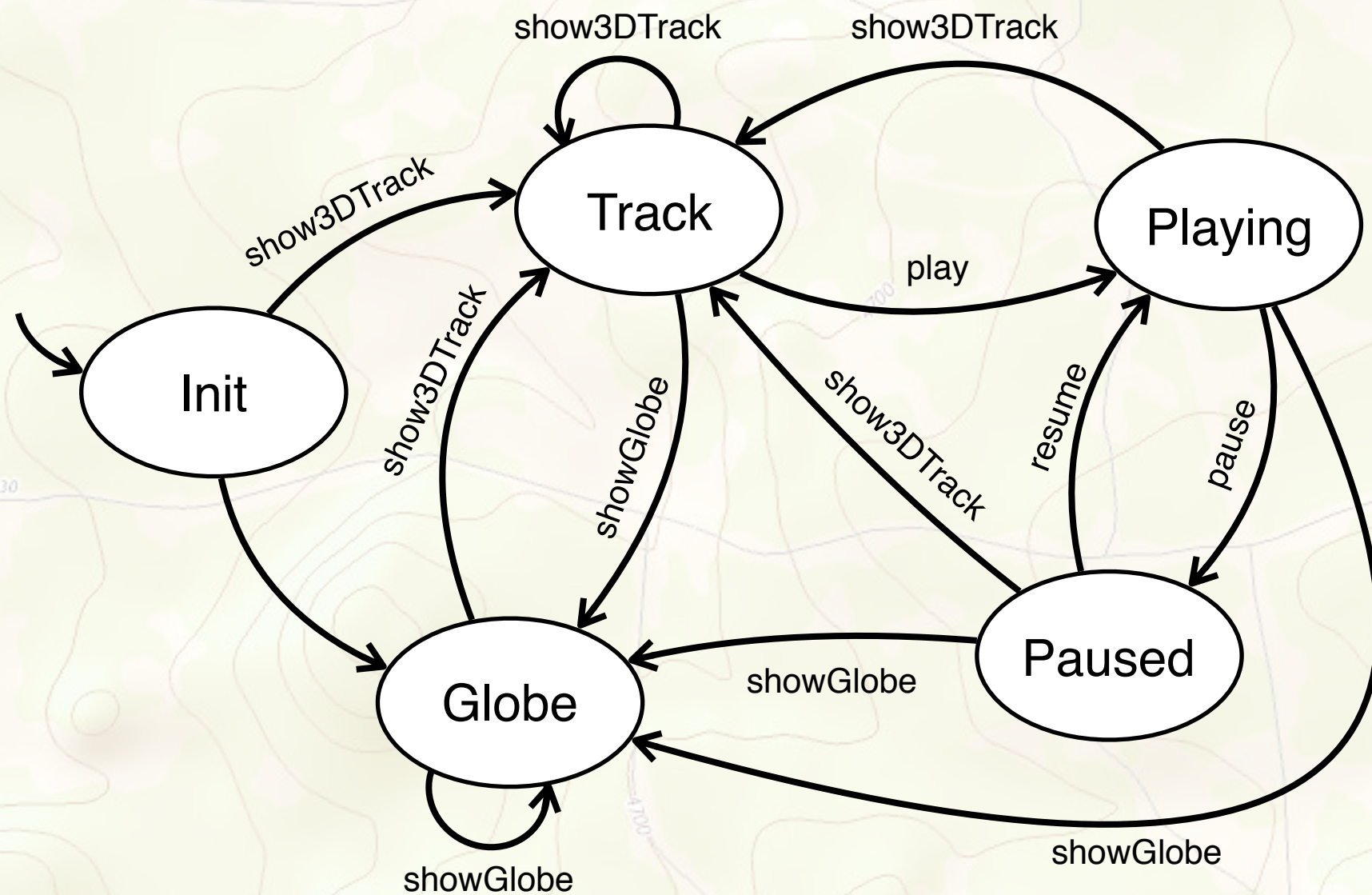
```
viewer.clock.shouldAnimate = true;
```

On pause...

```
viewer.clock.shouldAnimate = false;
```

... voilà, track playback animation!

3D track visualization finite state machine



With javascript-state-machine...

```
fsm3D = StateMachine.create({
  initial: 'Init',
  events: [
    {name: 'show3DTrack', from: ['Init', 'Track', 'Globe', 'Playing', 'Paused'], to: 'Track'},
    {name: 'showGlobe', from: ['Init', 'Globe', 'Track', 'Playing', 'Paused'], to: 'Globe'},
    {name: 'play', from: 'Track', to: 'Playing'},
    {name: 'finishPlay', from: ['Playing', 'Paused'], to: 'Track'},
    {name: 'pause', from: 'Playing', to: 'Paused'},
    {name: 'resume', from: 'Paused', to: 'Playing'},
    {name: 'refresh', from: ['Track', 'Playing', 'Paused'], to: 'Track'}
  ],
  callbacks: {
    onbeforeshow3DTrack: goto3DTrack,
    onbeforeshowGlobe: gotoGlobe,
    onbeforeplay: startPlaying,
    onbeforefinishPlay: resetPlay,
    onbeforepause: enterPauseMode,
    onbeforeresume: startPlaying,
    onbeforerefresh: refresh3DTrack
  }
});
...
fsm3D.showGlobe(initialCameraPosition, tracks);
...
function gotoGlobe(event, from, to, initialCameraPosition, tracks, ...) {...}
...
function goto3DTrack(event, from, to, t, tracks, ...) {...}
...
```

Simple but powerful

Decisions, decisions, decisions

- Web mapping libraries
- Libraries vs full frameworks
- Choice of languages
- SQL vs NoSQL
- BLOB storage
- Drivers vs ODM
- Security
- Scaling

Challenges & Lessons

- Developing incrementally
- Consistent look and feel across mapping libraries
- Multi-browser compatibility, especially mobile
- Dealing with stale libraries/projects
- Keeping an eye on performance and scalability

Contributions welcome!

<i>I just want to see the tracks</i>	Just go to rikitraki.com
<i>I want to save and share my own GPS tracks</i>	Register at rikitraki.com
<i>I want the author to fix bugs</i>	Create issues on Github: https://github.com/jimmyangel/rikitraki/issues
<i>I want the author to consider and work on new features</i>	Comment on the blog: https://www.rikitraki.com/
<i>I want to create my own and contribute code</i>	Fork & PR repos: https://github.com/jimmyangel/rikitraki https://github.com/jimmyangel/rikitrakiws

Find me @jimmieangel on Twitter



2D



Thank you!

