WEB DAY 2026

Building WebXR Experiences with React and Babylon.js

Simone De Vittorio
XR Technologist
Reactlyon

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Kudos

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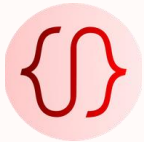

Partner

Paradigm Shift

2007: THE MOBILE SHIFT

ACCESSIBILITY AND PORTABILITY

Era of the rectangle: design for pocket-sized glass.

2026: THE SPATIAL SHIFT

INTELLIGENT, IMMERSIVE REALITIES

Era of the presence: design for the world around us.

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Escape from the "Flatland" Prison

- The 2D web is still trapped in rectangles and `<div>`
- We fake depth with shadows and parallax, but we're hitting a ceiling
- Huge data needs a new way to be represented

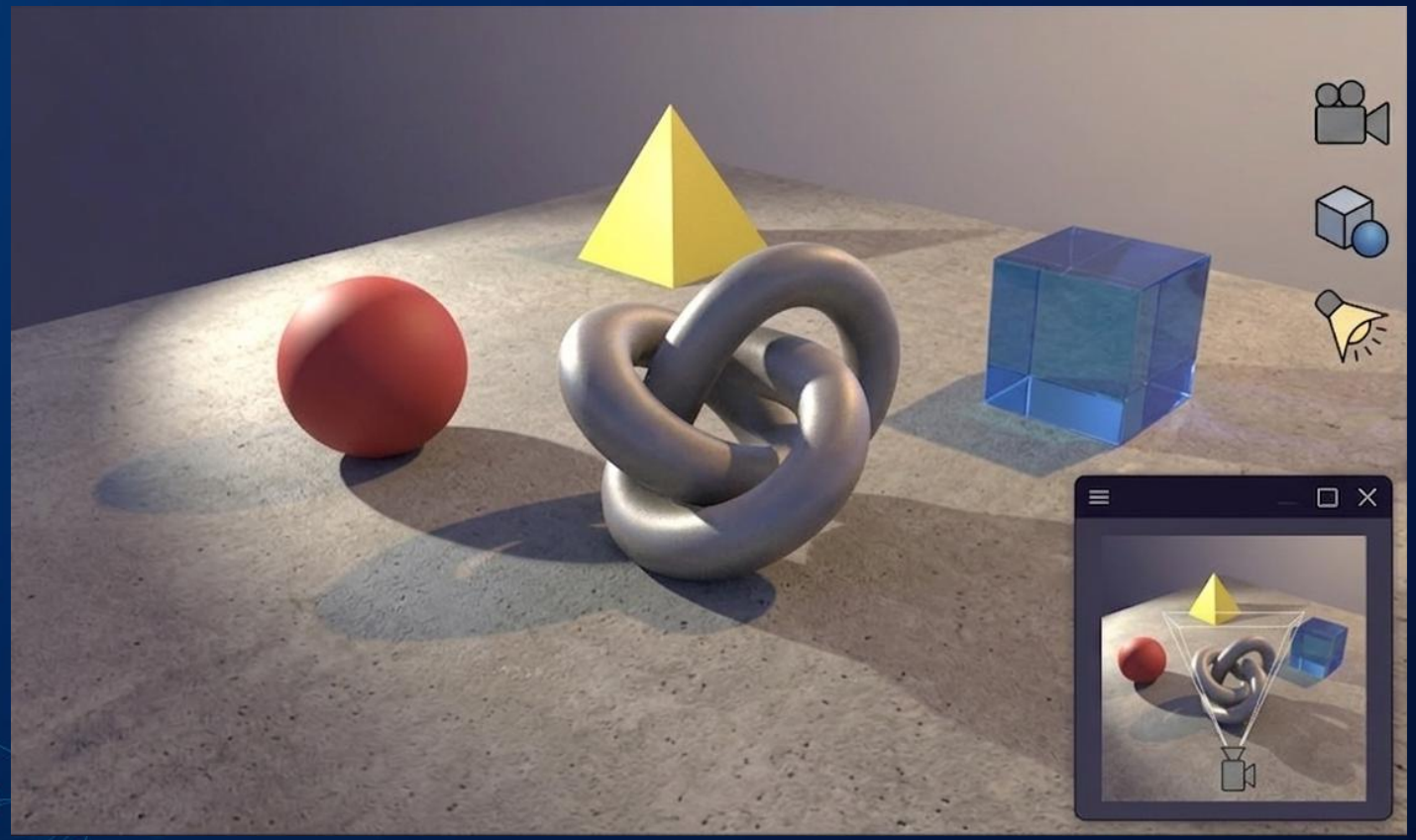
Humans live in 3D. Why don't our apps?

The Holy Trinity: WebGL, WebGPU & WebXR

- **WebGL**: The reliable foundation of browser 3D
- **WebGPU**: The next-gen leap for high-performance compute and graphics
- **WebXR**: The magic glue that connects our code to the lenses of an XR headset or smart glasses

The result: console-grade graphics, directly in a URL.

The Anatomy of a 3D World



Engine

↓

Scene(s) → global container(s)

- **Camera** → point of view
- **Lights** → illumination, shadows
- **Meshes** → 3D objects
- **Materials** → color, texture
- **Audio** → global, spatial
- **Physics** -> simulations
- **Animations**
- **Particles**
- **Post processes**
- **Events**
- **GUI**
- **XR Session**
- ...

Meet the Titan: Babylon.js

- **Graphic Engine**: Open-source, Microsoft-backed, and feature-complete
- **Performance**: Optimized for desktop, mobile, and standalone XR devices
- **Versatility**: NASA, CAD, indie games, e-commerce, portfolio
- **Cross Platform**: Web, PWA, mobile, and VR/AR/MR headsets

The 3D Friction

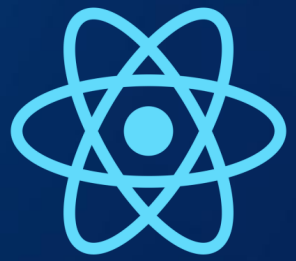
- **Manual lifecycle management**: Every object must be created, updated, and disposed explicitly, making code repetitive, and error-prone
- **Poor Scalability**: What starts simple quickly turns into a tangled scene graph that is difficult to understand, evolve, and maintain
- **Developer Experience Gap**:
  - No declarative mental model
  - No native HMR: Changes require a full scene reload
  - Logic-Rendering Coupling

React to the rescue!

- **Declarative**: Describe *what* you want, not *how* to do it
- **Component & Hooks**: Encapsulate complex 3D behaviors (physics, shaders, interactions)
- **HMR**: Live edits without scene reload
- **Ecosystem**: State management, linting, testing, UI library

Reactylon: What is it?

REACT



UI library for building **component-based** interfaces.

+

BABYLON.JS

JavaScript engine for building and rendering real-time **3D** and **XR** experiences.

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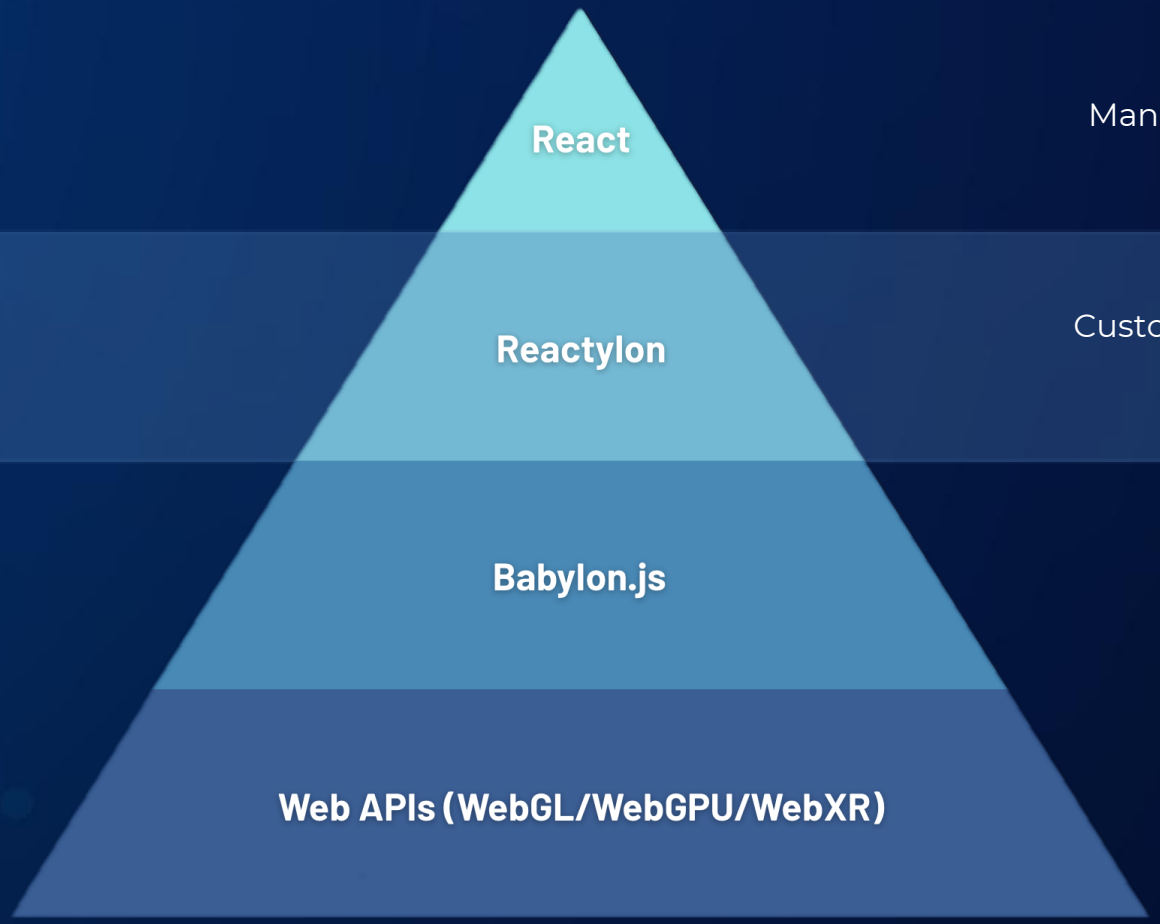
REACTYLON

An open-source multiplatform framework, designed to create interactive and immersive **3D/XR experiences**.

Where it fits



Manages components **state**, **props**, and **lifecycle** deciding when UI updates happen.

Custom **React renderer** that turns JSX into live 3D scene objects and manages their lifecycle.

High-level **3D engine** that owns scenes, cameras, lights, meshes, materials, and post-processing.

Browser's **low-level bridge** to GPU and XR devices.

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Reactylon: Why use it?

- Declarative **JSX syntax** for Babylon.js
- Full **TypeScript** support
- Automatic **objects management**
- Built-in **WebXR** support (VR/AR/MR)
- Interactive **documentation** (125+ live sandboxes)
- **Reactylon** (web) + **Reactylon Native** (desktop/iOS/Android/headset)

Babylon.js

```
const canvas = document.getElementById("renderCanvas");
const engine = new Engine(canvas, true);
const scene = new Scene(engine);

const camera = new UniversalCamera("camera", new Vector3(0, 5, -10), scene);
camera.target = new Vector3(0, 0, 0);
camera.attachControl();

const light = new HemisphericLight("light", new Vector3(0, 1, 0), scene);
light.intensity = 0.7;

const box = MeshBuilder.CreateBox("box", { size: 1 }, scene);
box.position.y = 1;

const material = StandardMaterial("material", scene);
material.diffuseColor = Color3.Red();
box.material = material;

// register a render loop to repeatedly render the scene
engine.runRenderLoop(function () {
    scene.render();
});

// watch for browser/canvas resize events
window.addEventListener("resize", function () {
    engine.resize();
});
```

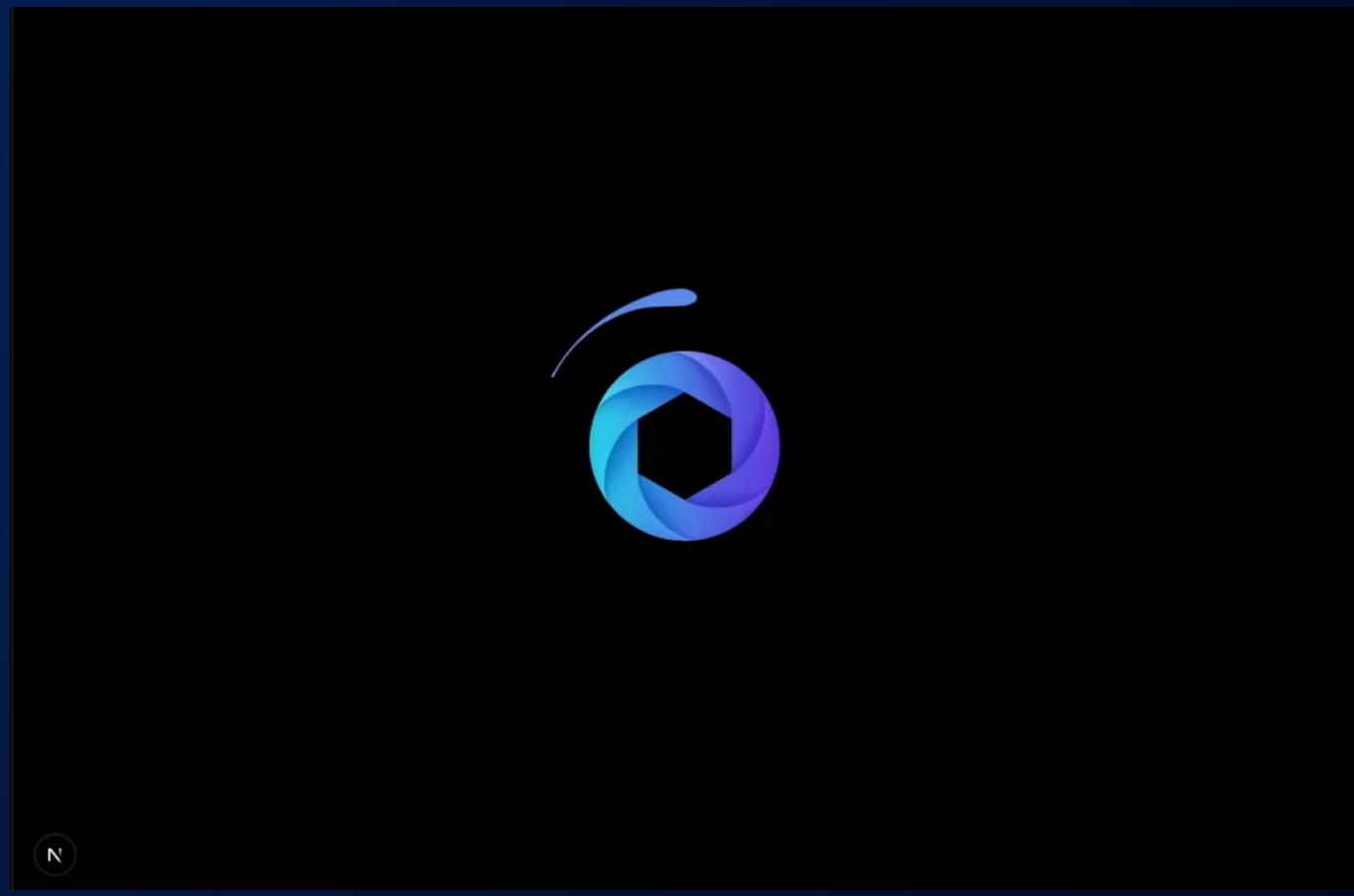
Reactylon

```
<Engine antialias>
    <Scene>
        <universalCamera
            name="camera"
            position={new Vector3(0, 5, -10)}
            target={new Vector3(0, 0, 0)}
            onCreate={camera => camera.attachControl()}
        />
        <hemisphericLight name="light" direction={new Vector3(0, 1, 0)} intensity={0.7} />
        <box name="box" options={{ size: 1 }} positionY={1}>
            <standardMaterial name="material" diffuseColor={Color3.Red()} />
        </box>
    </Scene>
</Engine>
```

Use Case: Interactive 3D

WEB - MOBILE

Deliver **interactive, real-time visuals** that let users inspect, configure, and understand products or data from any angle - right in the browser or PWA-with smooth animation, lighting, and near-photoreal materials. Beyond configuration, interactive 3D also powers **games and simulations**: physics, collisions, particles, skeletal/morph animation, pathfinding, audio, input, save/load, and multiplayer.



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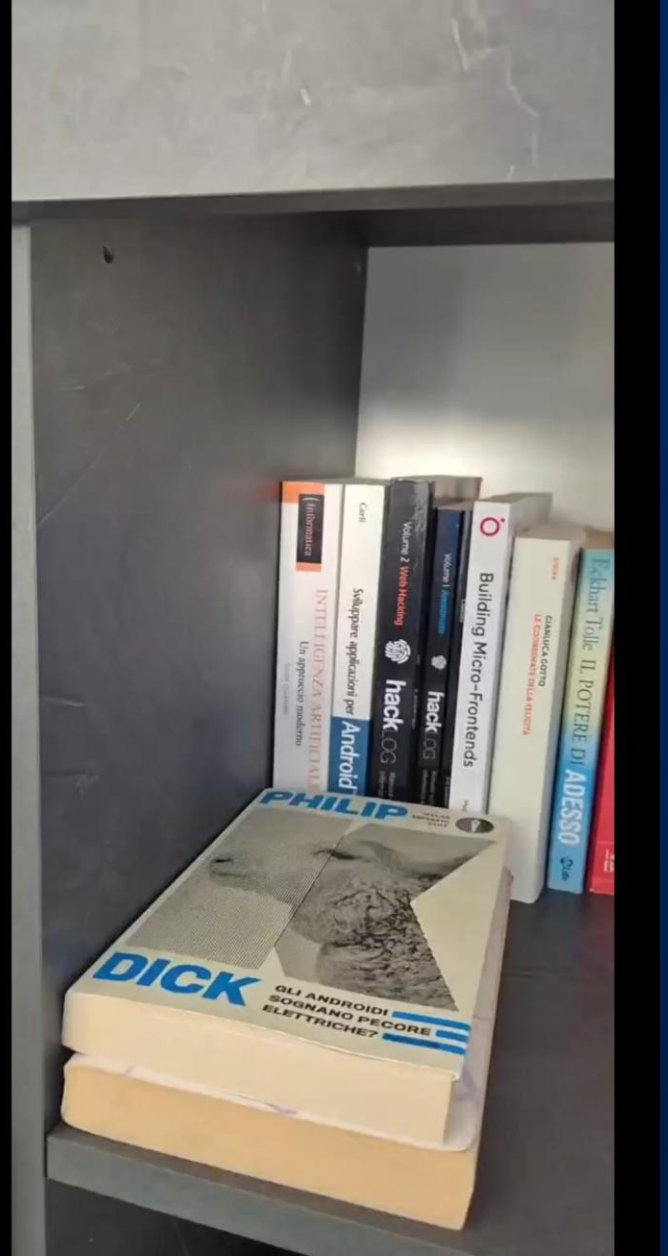

Use Case: VR/AR/MR

MOBILE – HEADSETS - GLASSES

Deliver **immersive experiences** in VR/AR/MR on mobile, headsets, and smart glasses: place and persist content in your space, **blend digital with the real world** via passthrough and occlusion, and interact naturally using hands, controllers, or touch (gestures, rays, grabs, teleportation). Build room-scale scenes with spatial audio, haptics, physics, particles, and animated characters; attach 3D UI or dock standard panels as floating surfaces.

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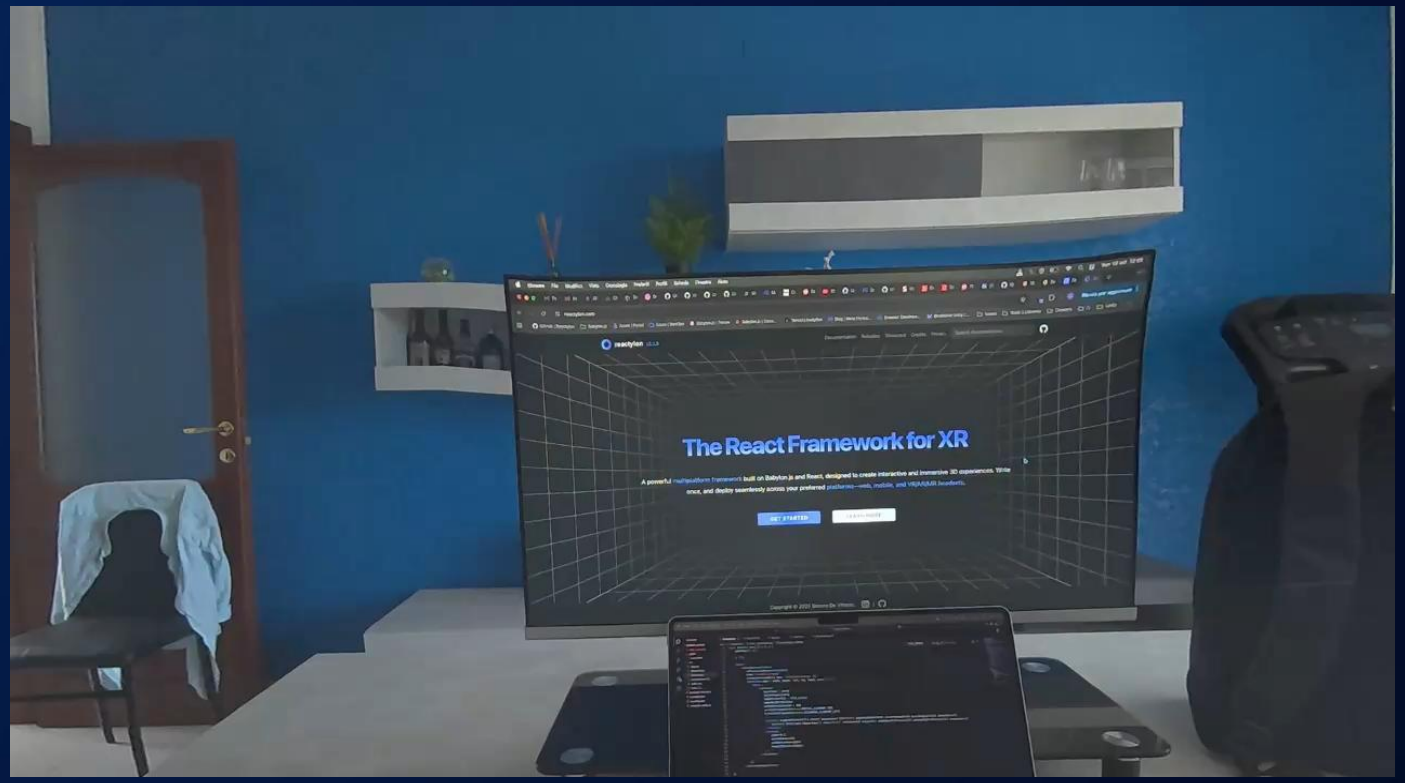
Use Case: Spatial AI Vision

MOBILE – HEADSETS - GLASSES

Deliver Spatial AI Vision on mobile, headsets, and smart glasses: use **passthrough/camera** feeds to run **on-device ML** (object detection, segmentation, pose/hand tracking, OCR) then anchor results into the 3D scene. Overlay labels, outlines, affordances, and guidance arrows; snap UI to detected surfaces; drive interactions with gaze/gestures/controllers; and trigger workflows in real time.



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Getting Started

Reactylon ships with a **CLI** that simplifies the process of generating new Babylon.js and Babylon Native projects, making it easier to start in different environments.

Web - Reactylon

npx create-reactylon-app webday

 React ^19  Babylon.js ^8

Mobile - Reactylon Native

npx create-reactylon-app Webday --native

 React ^18  Babylon.js 8.3.0  React Native 0.74.2

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Resources & Q&A

Documentation

GitHub

YouTube

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Thanks !

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