WebXR & Augmented Reality
Samsung Internet on the Play Store

Samsung Internet provides the best web browsing experience for you with Video Assistant, Dark Mode, and Ad Blocker.
Immersive Web at W3C
This is the union of the Immersive Web Community Group and Immersive Web Working Group at the W3C.

- The Metaverse
- https://immersive-web.github.io/

Pinned repositories

- **webxr**
  - Repository for the WebXR Device API Specification.
  - CSS 1.3k 266

- **webxr-gamepads-module**
  - Repository for the WebXR Gamepads Module
  - CSS 12 4

- **webxr-samples**
  - Samples to demonstrate use of the WebXR Device API
  - HTML 358 141

- **webxr-polyfill**
  - Use the WebXR Device API today, providing fallbacks to native WebVR 1.1 and Cardboard
  - JavaScript 213 41

- **proposals**
  - Initial proposals for future Immersive Web work (see README)
  - 76 4

- **administrivia**
  - A repo for managing the administrative tasks of the Immersive Web Group
  - 16 15
Virtual Reality Headsets
Augmented/Mixed Reality
Headsets
Phones
ADA ROSE CANNON
Developer Advocate - Samsung Internet

A-FRAME

three.js  r124

WebGL  WebXR

Native API  Hardware
WebXR Modules
Modules I will talk about

- Gamepad
  - Hand Input
- Augmented Reality
  - Hit Test
    - Anchors
  - Lighting Estimation
  - DOM Overlay
- Layers
Modules I will talk about

• Gamepad
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• Augmented Reality
  □ Hit Test
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  □ DOM Overlay
• Layers
The Web’s Gamepad API reused for XR

- XRInputSource.gamepad
- Not exposed in navigator.getGamepads
- Standard mappings to help consistent behaviour

Usually in Headset AR and VR
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Hand Input

Get the positions of each join in the user’s hand.

- Exposed as `xrInput.hand`
- Can access by name or all at once
- Does NOT do pose detection such as ‘pinching’ or ‘grabbing’
Headset AR or VR
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Augmented Reality

Combine 3D and the real world

- Adds "immersive-ar" session type
- No other AR features.

Handheld or Headset AR
Handheld or Headset AR
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    ➔ Anchors
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Hit Test and Anchors

Find a point in the real world (hit test) and keep track of it over time (anchors)

- `session.requestHitTestSource`
- `frame.getHitTestResults(this.xrHitTestSource)`
- `hitTest.createAnchor()`
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Lighting Estimation

Make 3D models look integrated with reality, provides:

- Main light direction and colour
- Reflection Map
- Approximation of the environment lighting as a numerical format*

* They are stored as coefficients of a 3rd order spherical harmonic it’s very cool
Camera and Screen based AR
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  ↦ Anchors
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Dom Overlay

Currently the only way to use HTML & CSS with WebXR

- Pick an element, it’s now stretched full screen on top of the WebXR content.
Handheld AR
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Layers

Efficiently display images or videos on simple shapes on top or underneath the 3D content.
Layers for AR and VR
Useful Tools
WebXR Emulator
Firefox/Chrome
https://immersiveweb.dev/

- Support Table
- Getting started quickly
- Examples

![WebXR](image)

The WebXR Device API provides access to input (pose information from headsets and controllers) and output (hardware display capabilities commonly associated with Virtual Reality (VR) and Augmented Reality (AR) devices). It allows you to develop and host VR and AR experiences on the web.

You can read more about the goals of this standardization effort by reading the [WebXR Container](https://immersiveweb.dev/).

**What does this mean...**

**For phones:**
- Enable VR by providing pose information and allowing the WebGL scene to be rendered side by side in a headset like the Cardboard.
- Enable AR by using the platform AR capabilities such as ARCore to render the WebGL scene onto the user environment like a magic window.

**For Desktops:**
- Desktop computers can make use of tethered VR hardware such as the Oculus Rift or HTC Vive to display the VR scene.

**For standalone AR Headsets:**
- Enable AR by using the platform AR capabilities to render the WebGL scene immersively onto the user environment.

**For standalone VR Headsets:**
- Enable VR by rendering the scene using the platform VR capabilities.
Thank you

@adarosecannon
@samsunginternet