WebGL + WebGPU Webinar Fall 2024

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KHRONOS GROUP / WEBINARS & MEETUPS

WebGL & WebGPU Updates

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Agenda

WebGL Updates

- ANGLE/Metal Progress
- Pixel Local Storage Progress

WebGPU Updates

- Standardization
- Implementations
- Three.js's WebGPU Backend
- Resources and Contributions

Call to Action: Join WebGL & WebGPU Communities

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ANGLE/Metal Progress

- Work is still ongoing in ANGLE's Metal backend
  - Used by WebKit's WebGL implementation on macOS/iOS, Chromium's on Apple silicon Macs, and soon, Chromium's on Intel Macs
- Many fixes in recent months
  - Fixed textureProj[Offset] for shadow samplers
  - Fixed textureGrad for shadow samplers on AMD GPUs
  - Infinite recursion with occlusion queries + lots of renderpasses
  - Overriding of clear color without a bound texture
  - Fix use-after-free in parallel linking error messages
  - Removed EAGL and older macOS code
  - Multiple fixes and cleanups in ANGLE's shader translator
  - Memory leak in stencil views
- Thanks to Alexey Knyazev, Kimmo Kinnunen, Dan Glastonbury, Quyen Le

Pixel Local Storage Progress

- Work has resumed to ship the Pixel Local Storage extension
- Simplifications to the underlying ANGLE specification and implementation are underway
- This, combined with additional validation, will complete the extension
- Hoping to ship across platforms in the next couple of months

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WebGPU Standardization Updates

Development happening on GitHub and at the W3C.

After the recent WebGPU F2F, the API and WGSL specifications are within 1 or 2 issues of taking the first “Candidate Recommendation” snapshot! (integer and stencil textureGather portability and stability)

Major progress on WGSL texture builtin testing thanks to Gregg Tavares from Google. Uncovered stability issues of corner-case features, being validated out from the API.

Significant progress on subgroup operations feature, key to achieving feature and performance parity with native platforms (with better portability).

Robust roadmap for next release laid out.

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WebGPU Implementation Status

Safari

- Enabled in Safari Technology Preview - please test!

Firefox

- Enabled in Nightly on Windows, Mac, and Linux!
- Aiming to ship to Release early in 2025.

Chromium

- Currently shipping on Windows, ChromeOS, Mac, and Android!
- Tracks the top-of-tree WebGPU and WGSL specifications
- web.dev/gpu for higher level details
- Looking forward to your feedback, and applications built using WebGPU!

Implementations are mostly interoperable already!

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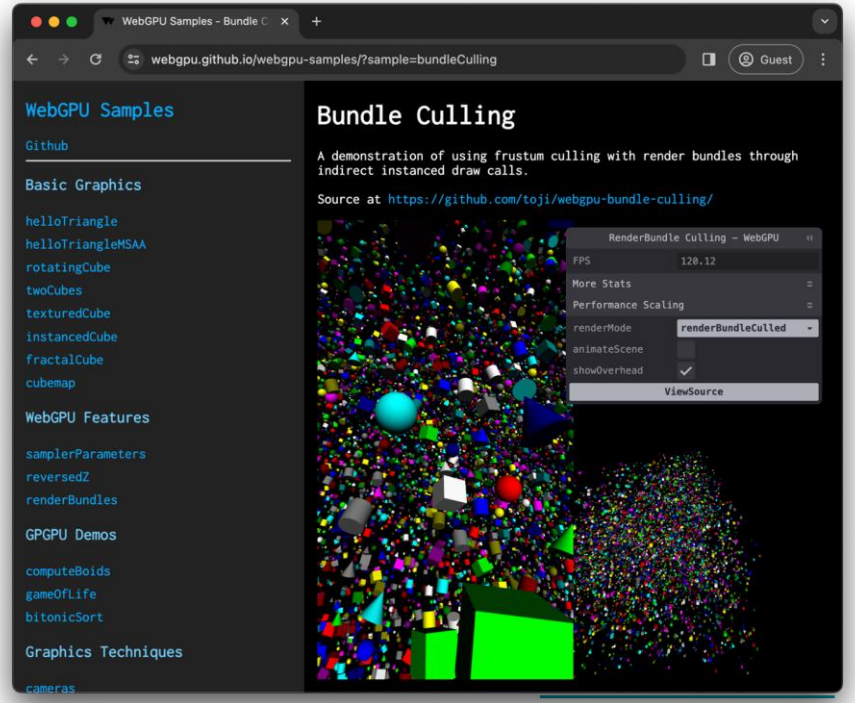
Three.js' WebGPU Backend

- Continued progress on Three.js's WebGPU backend
- Working to achieve feature parity with WebGL backend, and give developers confidence in targeting WebGPU
  - Some recent hiccups on the API side (filterable depth textures) raised questions about whether WebGPU is stable enough; think it is
- To ease developers' transition to the WebGPU backend, there are actually WebGL 2.0 fallbacks for most functionality!
- This is a major rearchitecture of Three.js; the team is still aiming for a first official release of the WebGPURenderer later this year
- There are already many WebGPU examples in Three's examples to refer to
- Thanks to sunag, mrdoob, Mugen87 and others for driving this work!
- Follow Three.js for the team's latest updates

WebGPU Samples

https://webgpu.github.io/webgpu-samples

- Refactored for easier participation
- Can add external examples too!
- Several new samples
  - MSDF text
  - skinned mesh
  - render bundle culling
  - points
  - multiple canvases
- **Submit yours**!!!



WebGPU Resources

Tutorials:

- WebGPU Fundamentals by Gregg
- WebGPU Best Practices by Brandon

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WebGPU Contributions!

Many ways to engage!

- Try the API and provide feedback (see later slides for channels)
- Try publishing sites using WebGPU
  - Can use WebGPU support in popular frameworks like Three.js, Babylon.js and TF.js
- Help with conformance testing
- Contribute samples / demos / articles using WebGPU

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Join WebGL & WebGPU Communities

- The WebGL and WebGPU APIs are supported by vibrant online communities!
- If you're developing with these APIs, we would like to hear from you!
- On the WebGL side:
  - Please join the WebGL Dev List: announcements of products, demos, new tools, job postings, questions, discussions - all are welcome!
  - Khronos' public_webgl mailing list hosts lower-traffic spec announcements
  - The WebGL Matrix chat room offers a way to talk with browser implementers and other developers
  - You can find a lot of cool stuff by searching #webgl on Twitter, Mastodon 😎

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Join WebGL & WebGPU Communities

- On the WebGPU side:
  - Have API feedback ? See the main WebGPU “gpuweb” repository for options to communicate it to the community group
  - The WebGPU Matrix chat room (#WebGPU:matrix.org) also offers a great way to talk directly with browser implementers and other developers
  - There's an increasing amount of cool stuff showing up on #webgpu on Twitter, Mastodon 😎
- We all look forward to hearing from you!

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A recording of this presentation will be available at
www.khronos.org/events/webgl-webgpu-meetup-november-2024

For more information on WebGL, please visit
https://www.khronos.org/webgl

For more information on WebGPU, please visit
https://github.com/gpuweb/gpuweb

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