

## **CIS 5650 2025 Final Project - KTX2 Viewer**

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**Overview:** This project aims to develop a KTX2 texture viewer on both Vulkan/RenderDoc and WebGPU/VSCode gLTF plugin. The goal is to provide an open-source cross-platform SDR + HDR viewer that allows developers and artists to accurately visualize KTX2 textures with Windows HDR support. Planned features include mipmap visualization, tonemapping, and integration with existing pipelines such as RenderDoc and VSCode.

**Motivation:** GPU textures are being used everywhere today from our laptops to our smartphones. The current tools for previewing GPU textures are quite difficult to work with, and most companies have developed their own “hacks” for working with the data. In talking with industry experts, they explained the gap in the industry and expressed the widespread need for a KTX2 previewer tool.

**Relevance:** In this project, we hope to contribute to open source projects. If we’re successful, this tool has the potential to draw in thousands of users.

### **Milestones:**

- *Milestone 1 - Nov 12th*
  - Get KTX2 basic viewer working in our two deliverable pipelines
    - WebGPU + VSCode
    - RenderDoc
    - Stretch Goal: Vulkan
- *Milestone 2 - Nov 24th*
  - Ensure SDR and HDR work in both pipelines
  - Implement and compare different tone mapping operators (Reinhard, Hable, ACES)
  - Verify correct color space handling
  - Compare results with current openHDR and RenderDoc outputs to ensure correctness
- *Milestone 3 - Dec 1st*
  - Create a GUI for settings and analysis tools
    - Stretch Goal: channel and alpha previews, exposure controls, histogram visualization for debugging dynamic range
  - Windows HDR compatibility
  - Optimize texture upload and rendering pipeline for performance
  - Add robust error handling and input validation for different file formats
    - Check that KTX file is compressed or not
- *Final - Dec 8th*
  - Further polish and submit pull request to renderDoc
  - Contact Ed Mackey about merging into/on top of gLTF VS Code Plugin
  - Documentation
    - Add usage guide for developers and artists

**APIs/Platforms:** Vulkan/RenderDoc, WebGPU/VSCode GLTF plugin

### **Resources/Related Work:**

[Texture compression formats](#)

[ASTC GPU texture format](#)

[Design of a CPU-GPU Hybrid ETC2 Encoder](#)