



# FrameRetrace: A Responsive UI for Apitrace

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## About me:

- Working on Linux platforms since 2004, with a background on embedded devices.
- Contributed to Intel's Graphics Performance Analyzers tools for Android OpenGL ES applications 2011-2014.
- Joined Mesa in 2014, working on performance tools and automation.

# GPU Tools stumbling blocks

- Generally hardware-specific
- Mostly closed source
- Linux support is an afterthought
- Tracing/retracing not reliable
- Low numbers of users
- Mesa support for GPU performance counters





# FrameRetrace: frame analysis based on ApiTrace

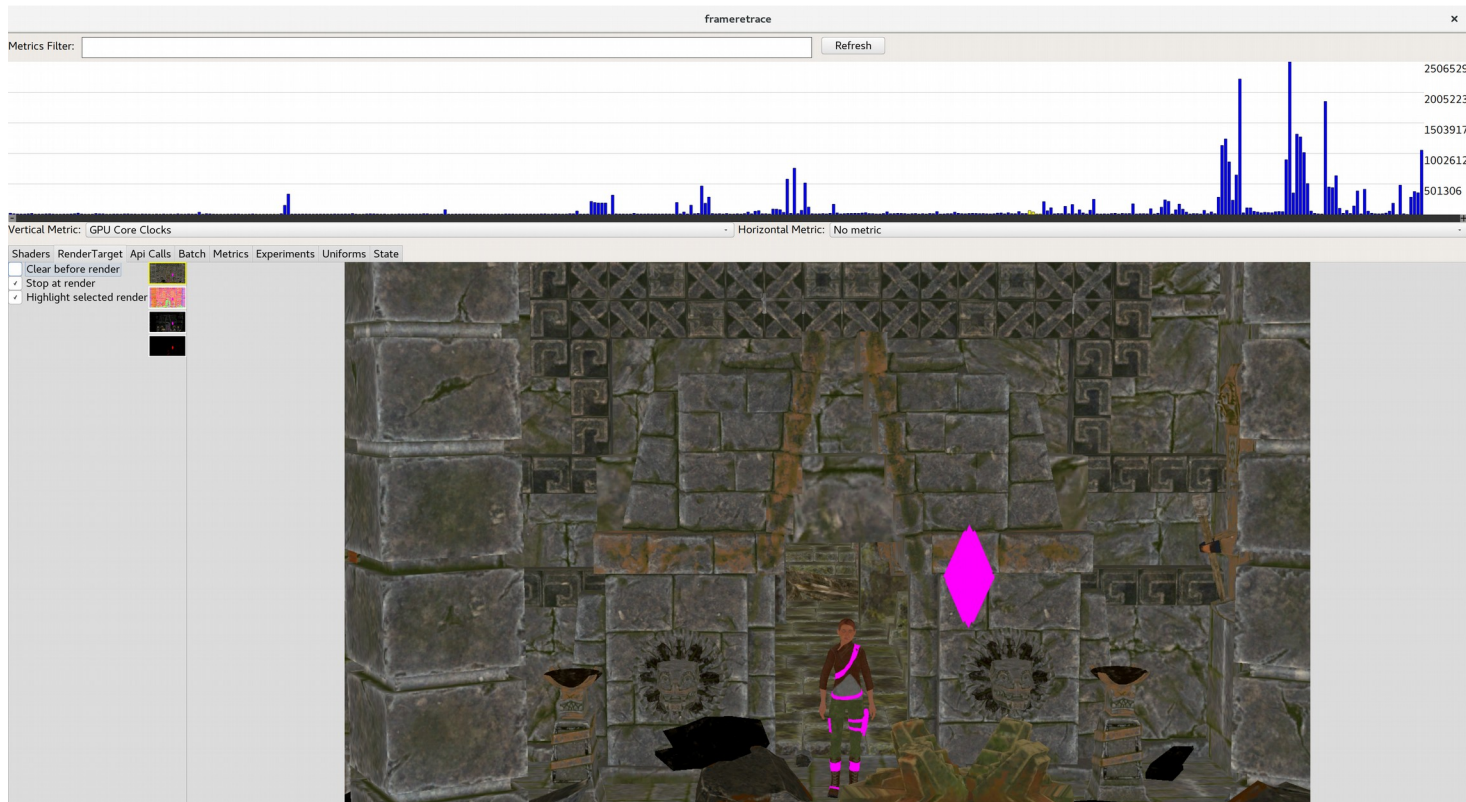
- Widely used and high quality trace/retrace
- <https://github.com/janesma/apitrace>
- Cross-platform: Linux and Windows
- Upstream GPU Counter support in Mesa and Kernel for Haswell and later.
- Leveraged by Intel Mesa team to identify and fix several performance issues in i965.
- Support for Radeon and VC5 in progress.



# FrameRetrace: frame analysis based on ApiTrace

- GPU Metrics for each render
- Render target visualization and experiments
- Api log
- Batch disassembly
- Shader analysis, live editing, and assembly
- Uniform constant display and live editing
- Render experiments
- State display and live editing

# Demo



# Other features

- Windows support provides important leverage for open source driver teams seeking to find Mesa performance gaps.
- Proposed features:
  - Display texture state, with mip clamp experiment
  - Display geometry mesh
  - Depth buffer visualization
  - Overdraw / hotspot rendertarget visualization
  - UI improvements
  - Support for more hardware (Radeon and VC5 in progress)
  - Android support

# Caveats

- Currently a one-person side project, with help
  - Thanks to Laura Ekstrand, Robert Bragg, Lionel Landwerlin, Eero Taminen, Pekka Jylhä-Ollila, Marek Olšák
- Experiments require intricate state tracking
- Some workloads do not have single-frame run loops
- Radeon metrics exposed by `AMD_performance_monitor` are not human-usable
- Please help!





# Questions?



