PRISM
A MODERN VIEWPORT

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Each studio brings their own unique approach to the market while leveraging Technicolor’s R&D teams to harness the new technological demands of compelling.
ADELAIDE – AUSTRALIA
BANGALORE – INDIA
LOS ANGELES – USA
MONTREAL – CANADA
• OpenGL slows down with the increase of the dataset complexity
• No unique way to describe shaders and use in different production software
• Hard to visualize production shader
• Lighting doesn’t match the production renderers even roughly
• No way to visualize custom primitive types
  • Volume (e.g. OpenVDB)
  • Hair
• No way to scale in the cloud
Early SIGGRAPH Demo 2018
What was our goal?

- We need a modern interactive viewport targeted for the next 5 years
- Fully real time
- Fully scalable between performance and quality
- Compatible with the production software
- Support of production shaders (*e.g.* Open Shading Language)
- Ability to work using cloud technologies
What is PRISM?

• A modern and real-time viewport
• Single GPU and multiple GPU rendering solutions
• Targets visualization and rendering of film production assets
• From simple visualization of extremely complex scenes to the near finish results comparable to offline renderers (e.g. Pixar Renderman)
• From extremely fast to progressive physically-based global illumination
• Performance is fully scalable between speed and quality depending on our needs
• Natively compatible with software like Millefiori (internal initiative) or commercial products such as Autodesk Maya and Side FX Houdini due to the render delegate for Hydra
PRISM Technologies

- NVIDIA OptiX
- Open Shading Language
- Pixar Hydra
- Pixar OpenSubdiv
Using PRISM inside Autodesk Maya

- Own implementation of Pixar USD for Autodesk Maya
- Interaction between Pixar USD proxies shapes and Autodesk Maya geometry
- Uses Pixar Hydra with support of external renderer delegates
Using PRISM inside Millefiori

- A visual effects production application for viewing and editing multiple large scenes at once
- Initiated as a sequence editor by Mill Film, MPC R&D and Technicolor R&I
- Changing shaders and lights
- Modifying attributes, transformations and flags
- Adding comments to the objects
- Uses Pixar Hydra as viewport
Using PRISM as generic Hydra Delegate

- Full support of Hydra
- Full support of Open Shading Language
- Multiple visualization modes
- Native selection and highlighting
Implementation

DCC

Pixar Hydra
- Render Engine
- Usd Imaging
- Hd

Prism Hydra
- plug-in

Prism Core
Pixar Hydra in PRISM
Prism Hydra Plugin Implementation

- Fully compatible with Hydra
- Lighting
- Materials
- Viewport selection
- Interactivity (supports all types of editing)
- Includes OSL integration
- Allows compositing with OpenGL context
• Fully supported with some OSL GPU limitations
  • No strings on multi GPU
  • No textures
Supported lights using PRISM

- Directional
- Point
- Spot
- Area (with texture)
- Environment (with texture)
Supported materials using PRISM

- **Surface**
  - Pixar Surface
    - With textures
  - OSL PTX
    - Standard closures
    - Microfacets
- **Light**
  - With textures
Future work

- Texture streaming
- Reusing OpenGL buffers
- Displacement
- Fur/hair
- Motion blur
- Cloud rendering
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QUESTIONS?
THANK YOU