

PRISM

A MODERN VIEWPORT

Victor Yudin – Lead Software Developer at Mill Film

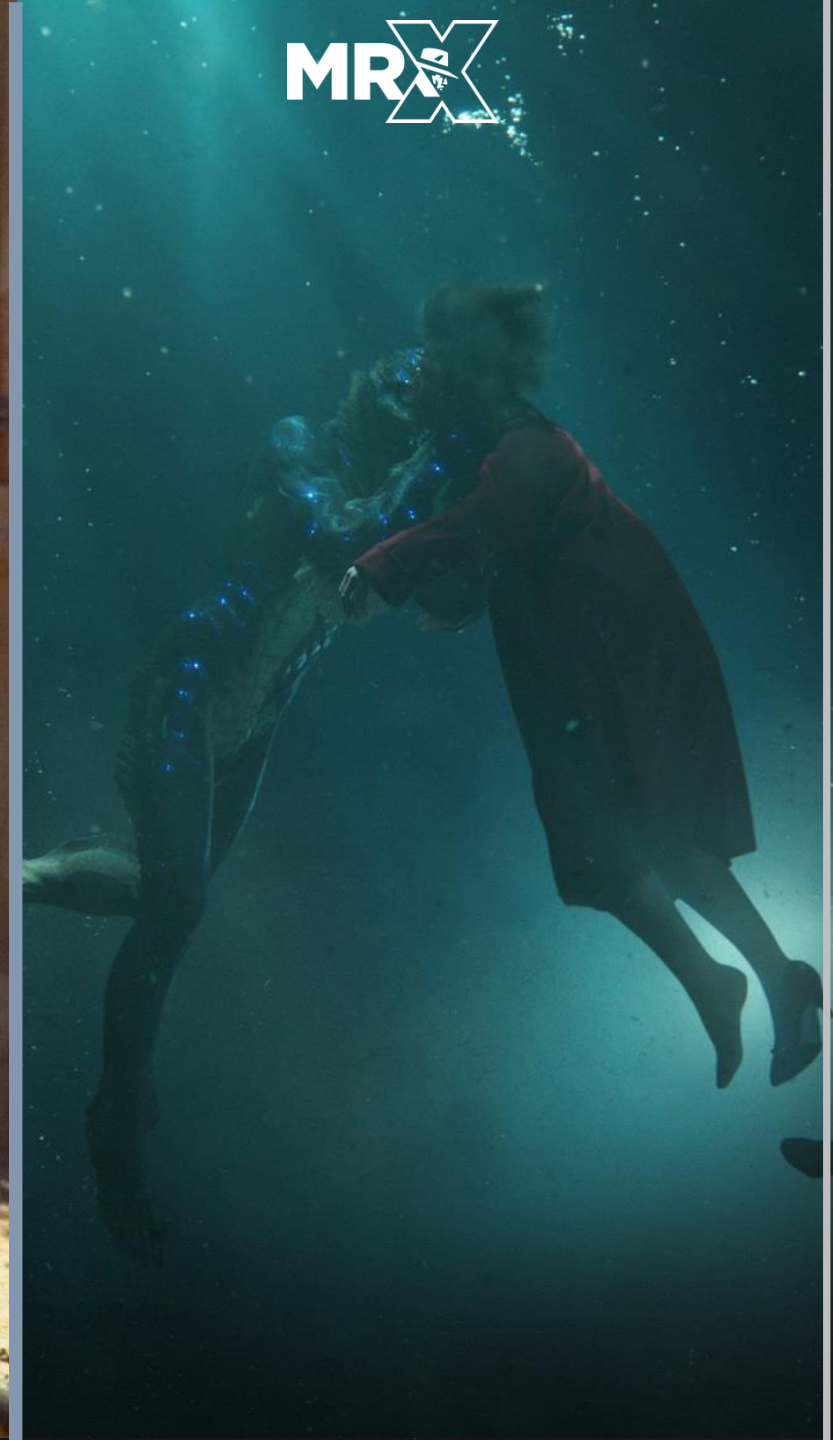
technicolor



MPC Film



MPC Film



Technicolor has the industry's most prominent portfolio of VFX brands, including MPC, MILL FILM and MR. X, Our VFX studios add VISUAL WONDER and CREATIVE EXPERTISE to film and episodic.

WE ARE A FAMILY OF CREATIVE VFX BRANDS

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

VISUAL EFFECTS GLOBAL FOOTPRINT



ADELAIDE – AUSTRALIA
BANGALORE – INDIA
LOS ANGELES – USA
MONTREAL – CANADA

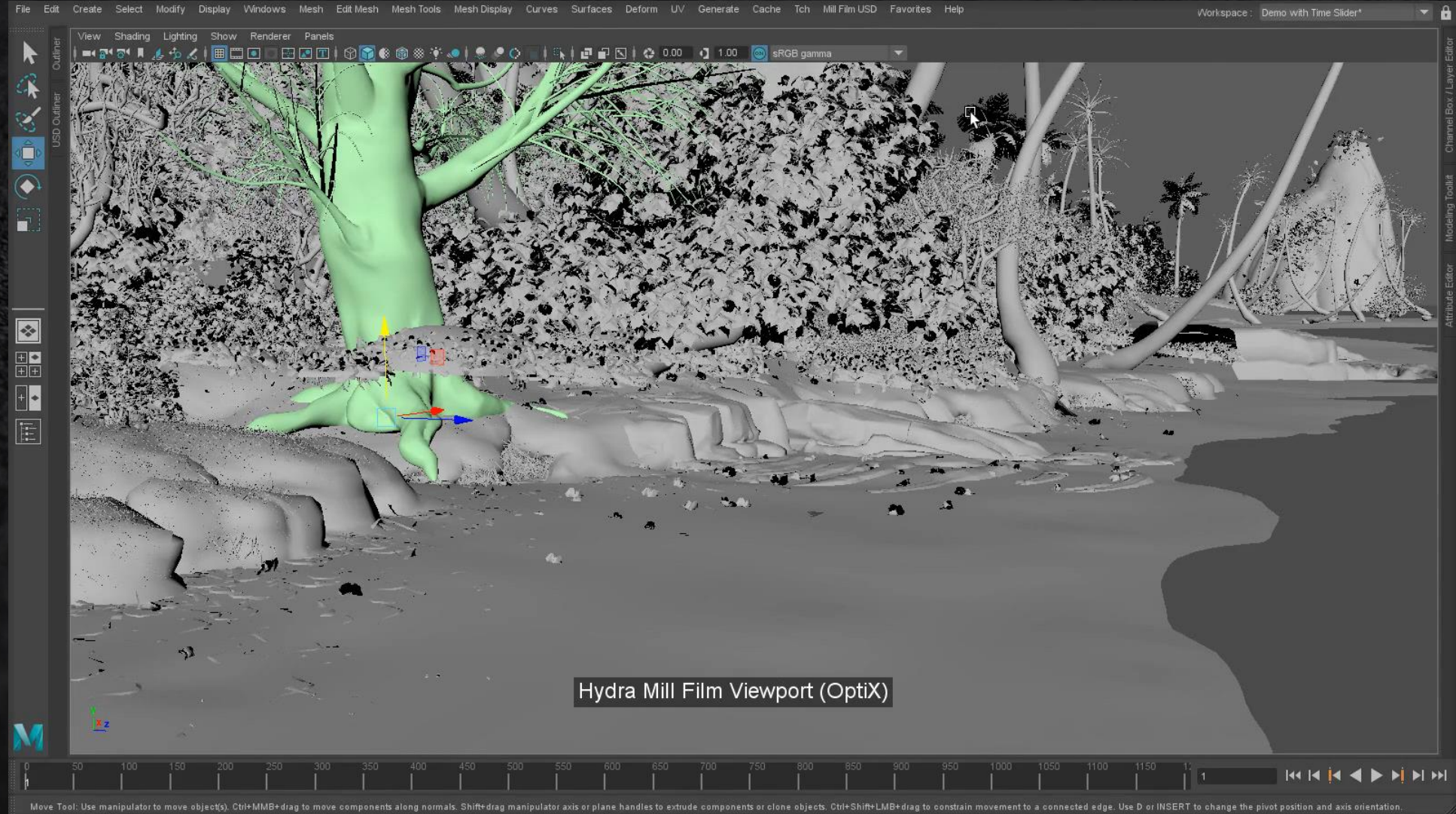


WHY BUILDING A NEW VIEWPORT?

- 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



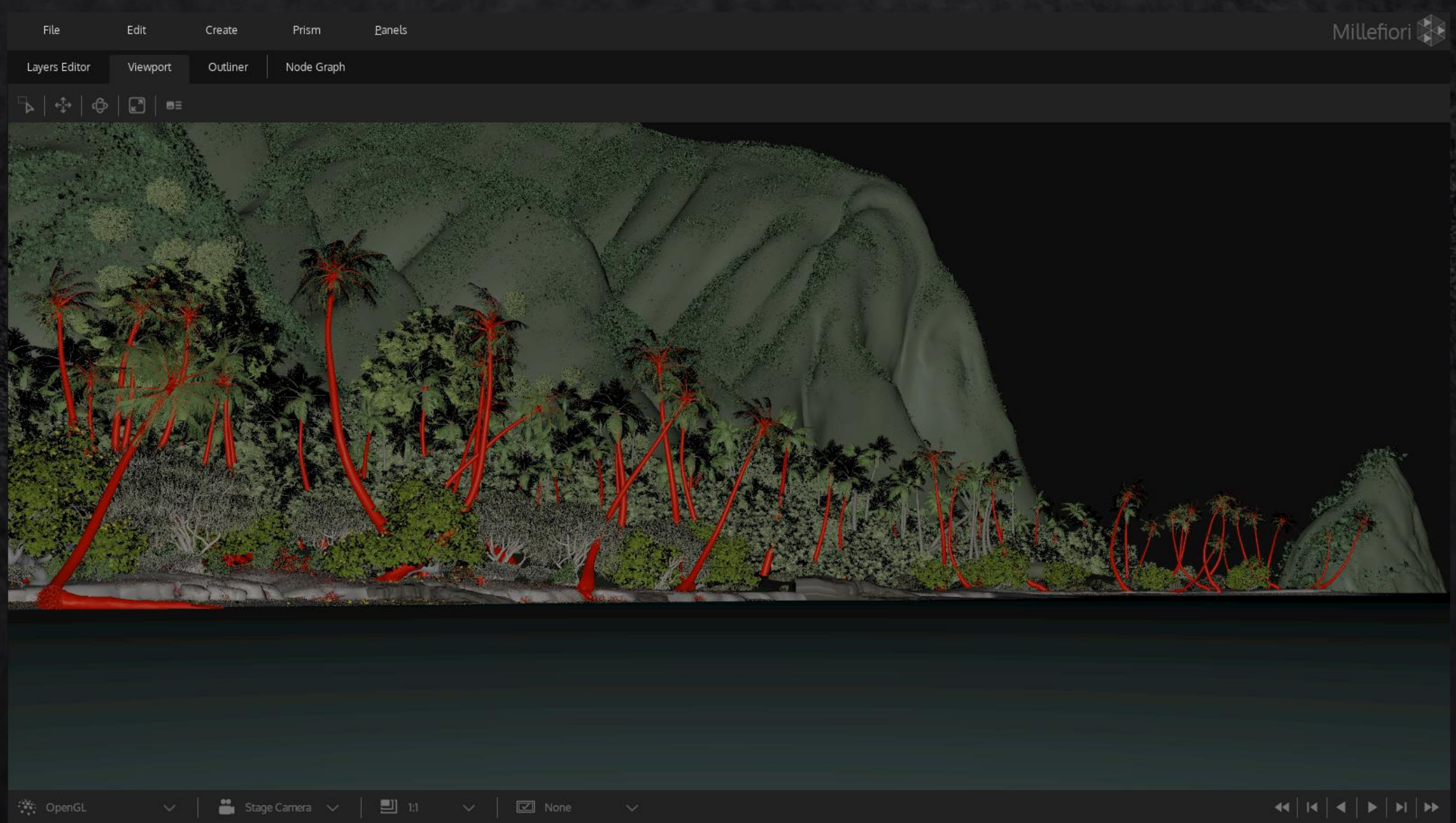
Early SIGGRAPH Demo 2018

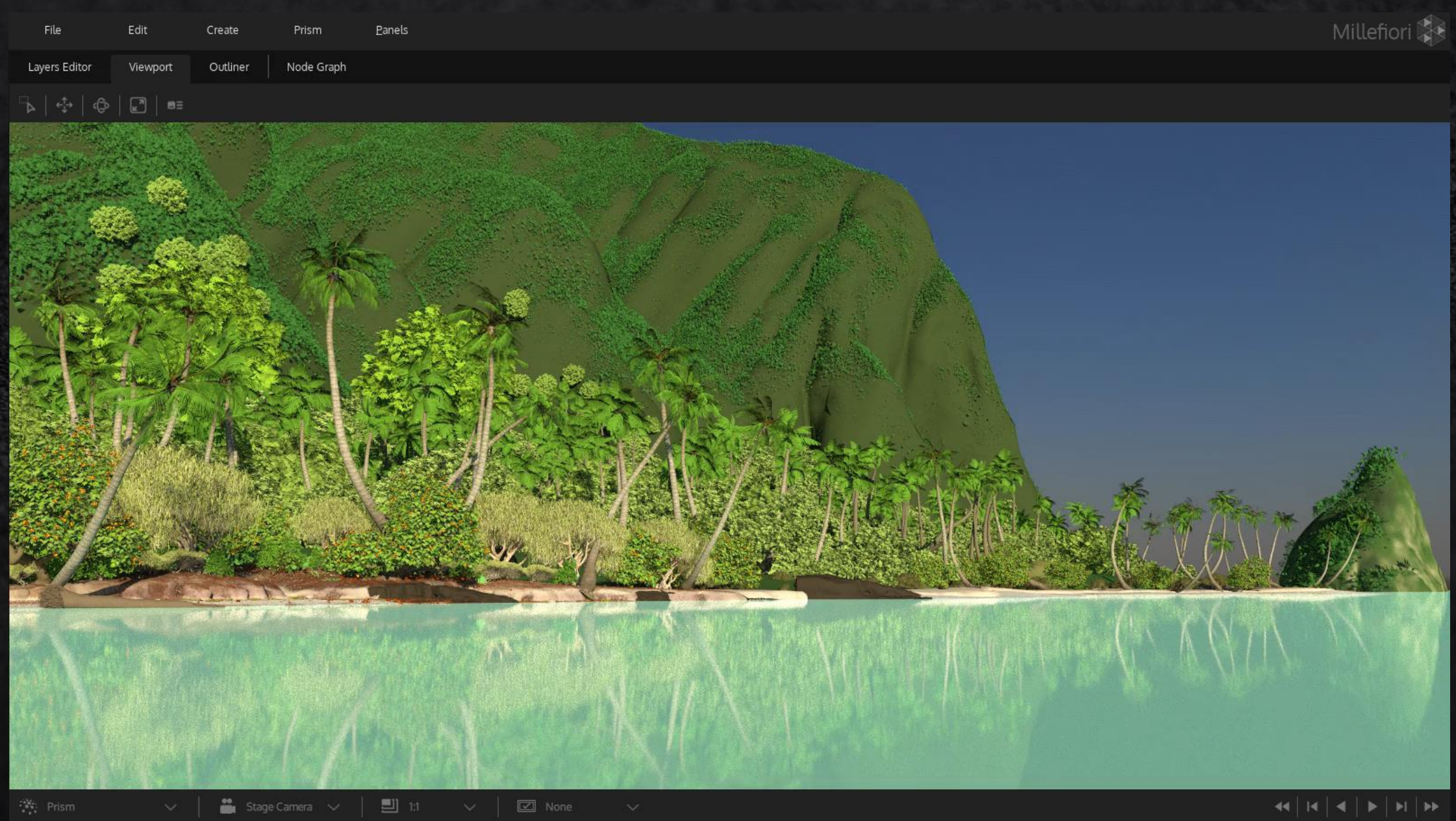


What was our goal?

- 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



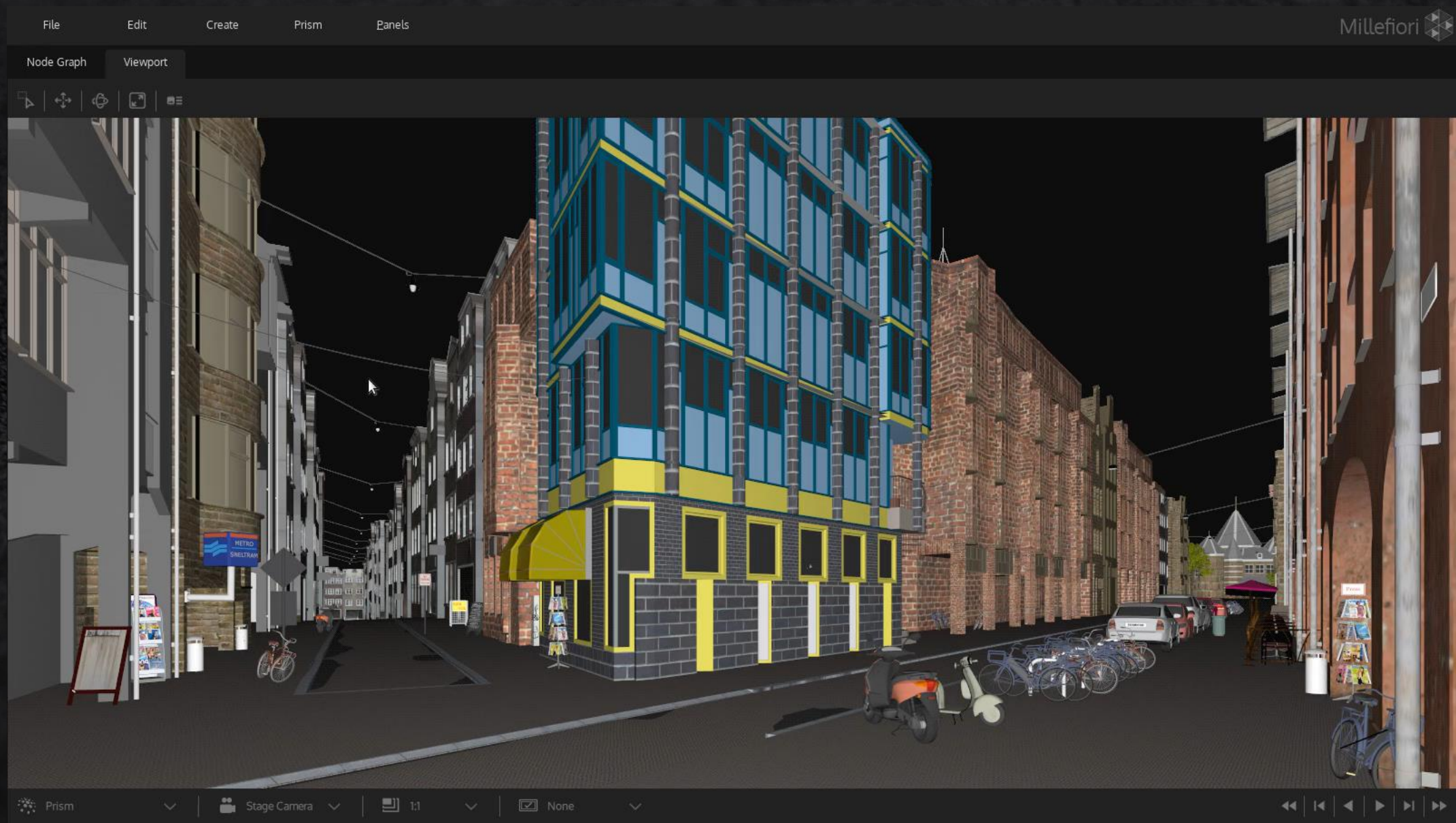




What is PRISM?

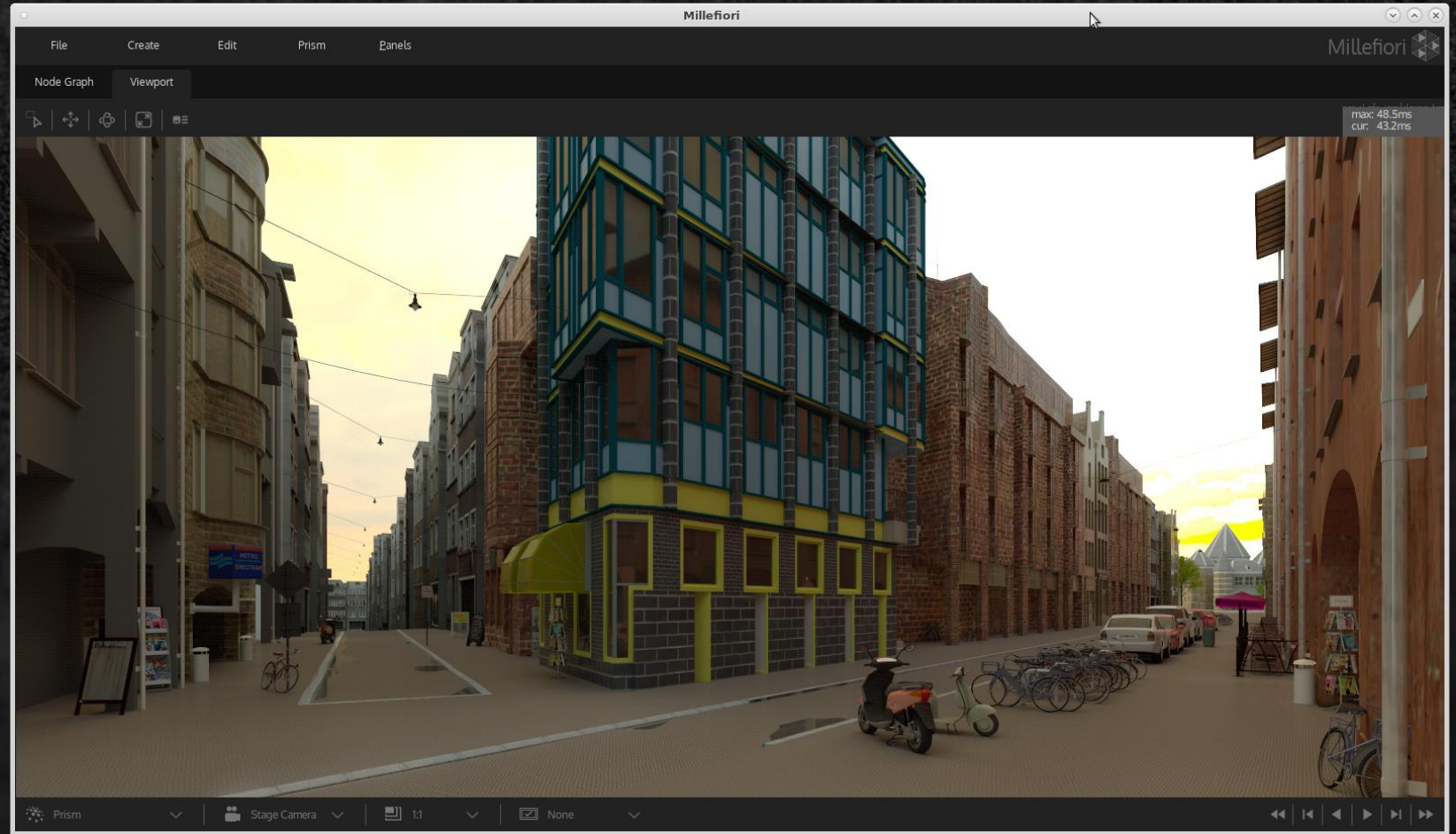
- A modern and real-time viewport
- Single GPU and multiple GPU rendering solutions
- Targets visualization and rendering of film production assets
- From simple visualization of extremely complex scenes to the near finish results comparable to offline renderers (*e.g. Pixar Renderman*)
- From extremely 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



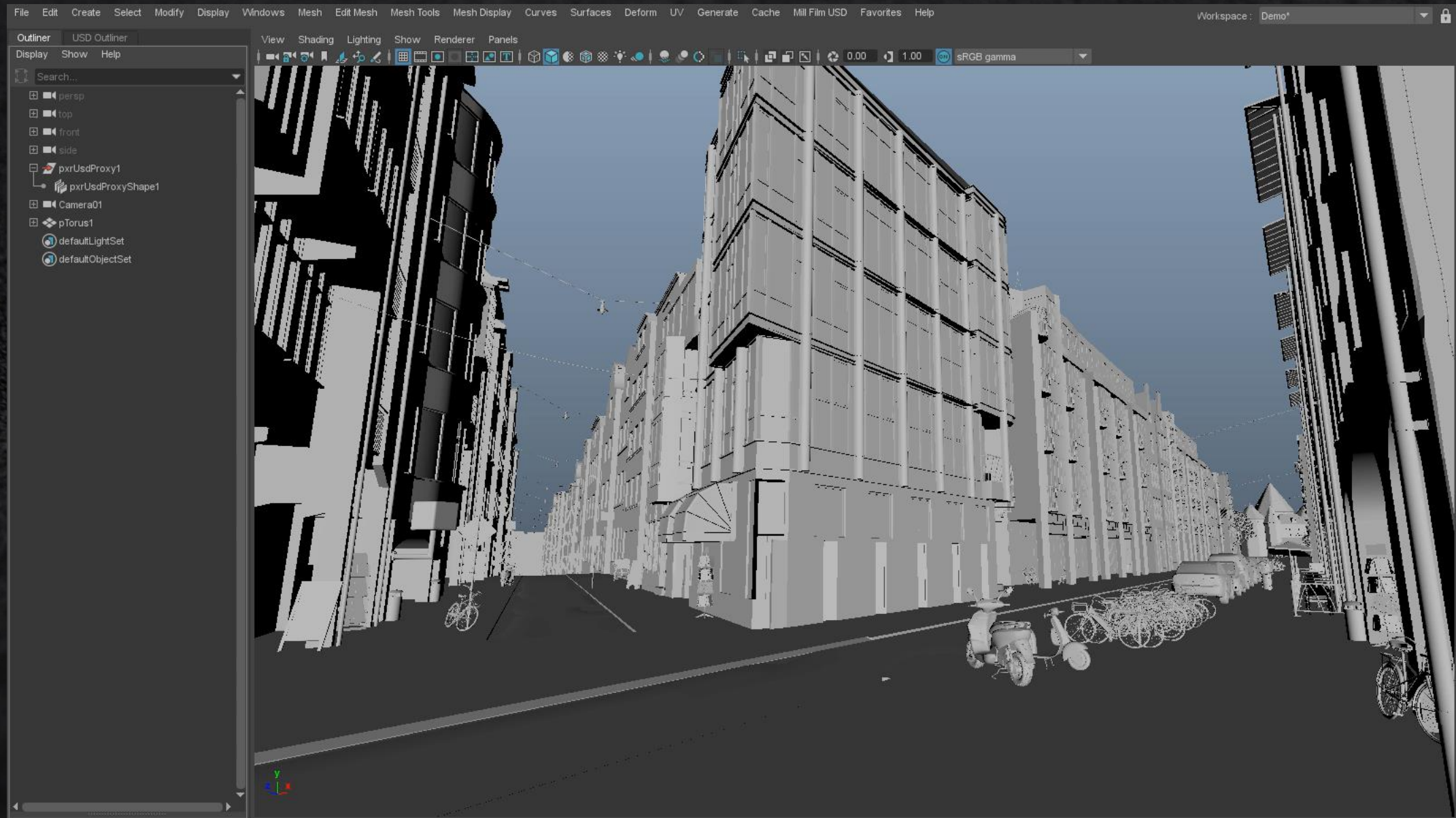
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Using PRISM inside Autodesk Maya

- 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

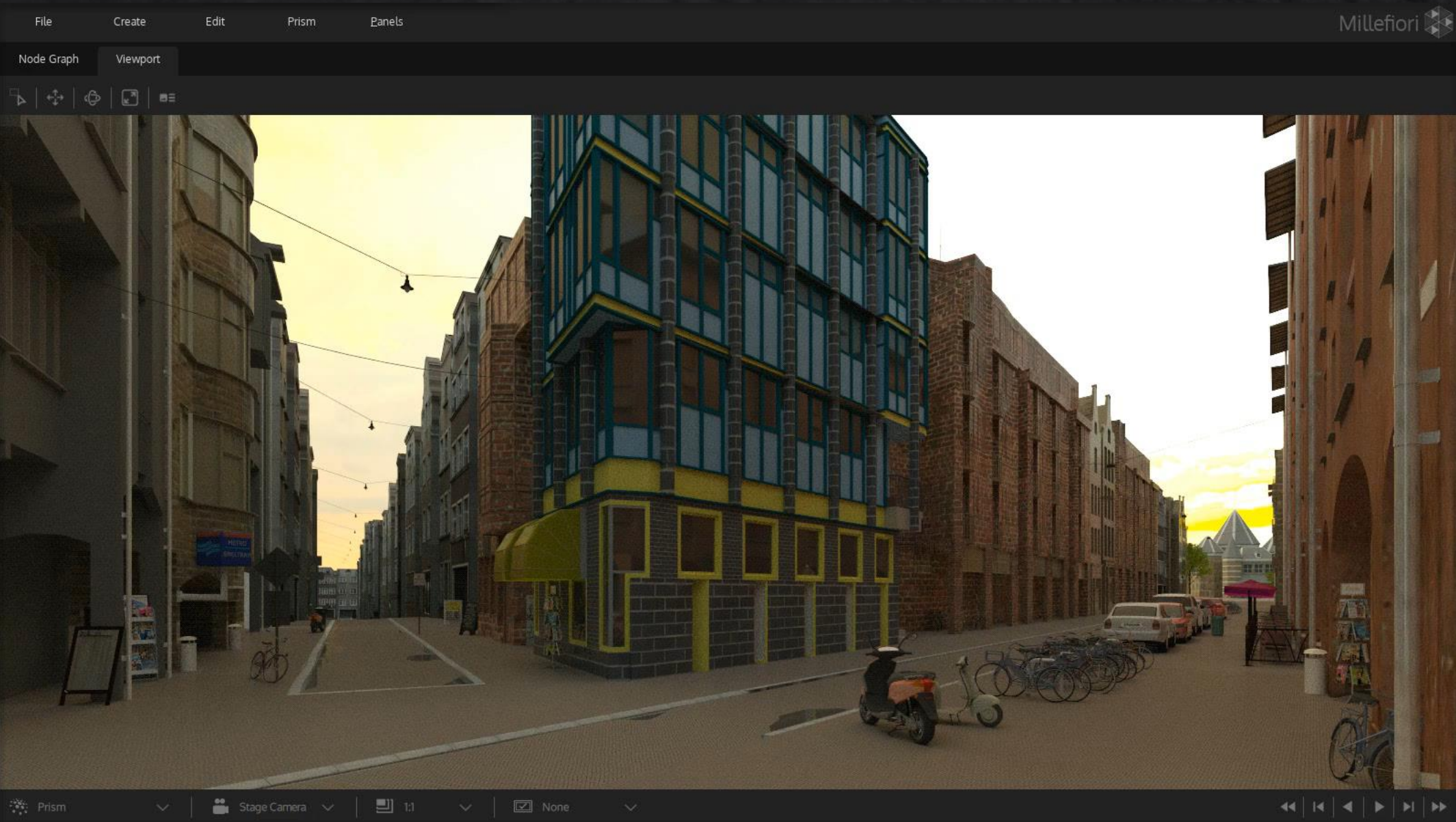




Using PRISM inside Millefiori

- 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



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Prim Name	Type	Vis
▼ root		
▼ Buildings	Xform	V
▼ Buildings_101	Xform	V
Buildings_101	Mesh	V
▼ Buildings_102	Xform	V
Buildings_102	Mesh	V
▼ Buildings_103	Xform	V
Buildings_103	Mesh	V
▼ Buildings_104	Xform	V
Buildings_104	Mesh	V
▼ Buildings_105	Xform	V
Buildings_105	Mesh	V
▼ Buildings_106	Xform	V
Buildings_106	Mesh	V
▼ Buildings_107	Xform	V
Buildings_107	Mesh	V
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Buildings_118	Mesh	V

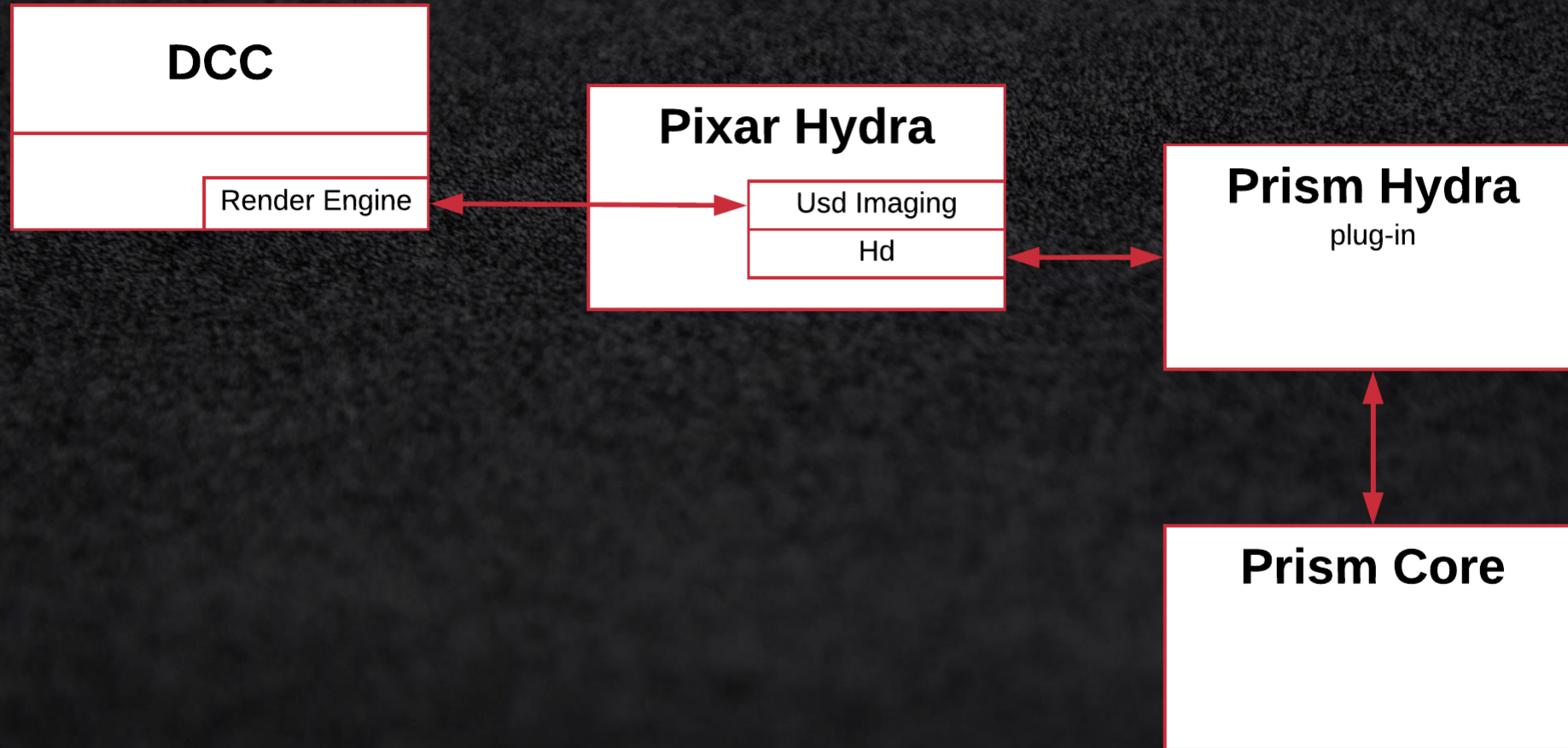
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Search for prim by name

Find Prim



Implementation

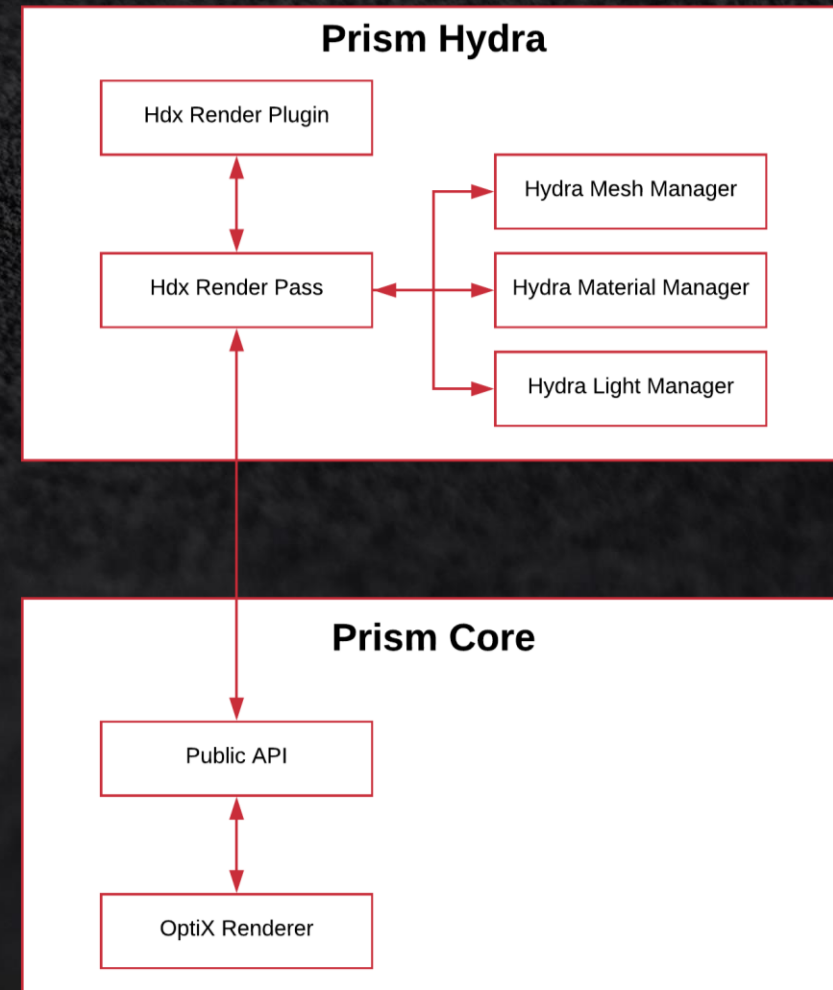


Pixar Hydra in PRISM

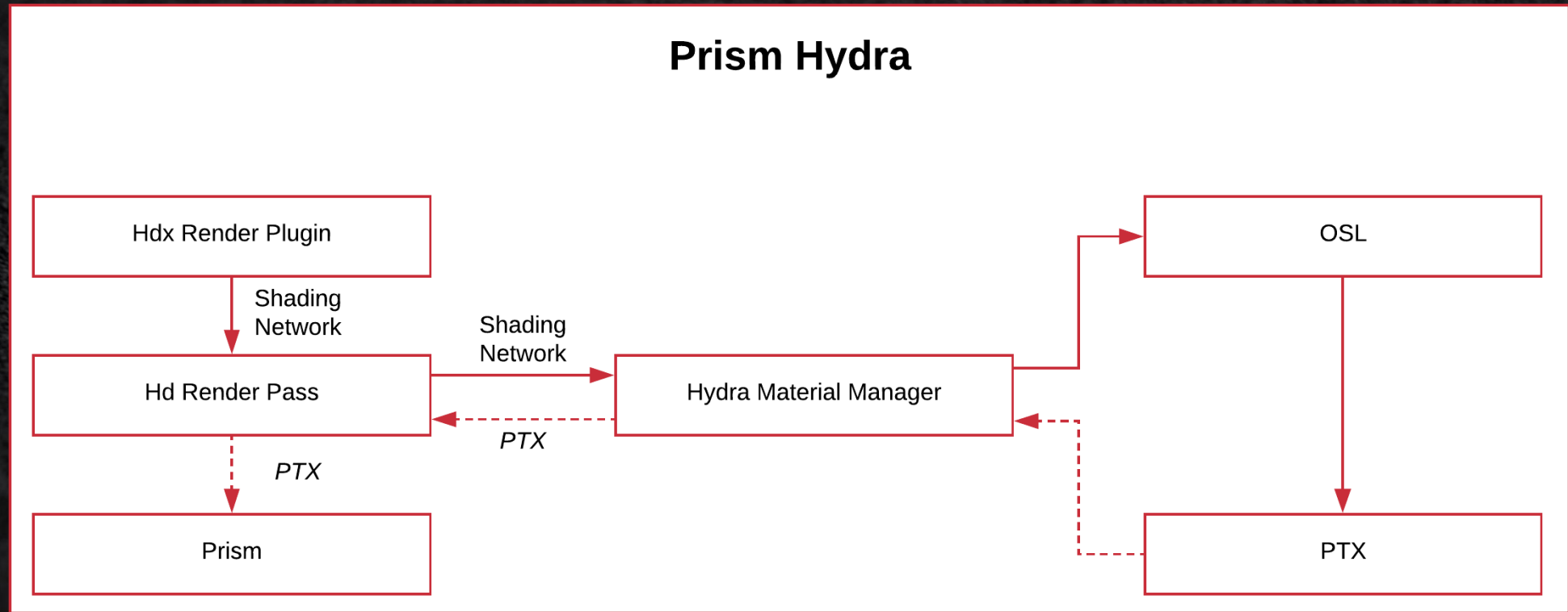


Prism Hydra Plugin Implementation

- Fully compatible with Hydra
- Lighting
- Materials
- Viewport selection
- Interactivity (supports all types of editing)
- Includes OSL integration
- Allows compositing with OpenGL context

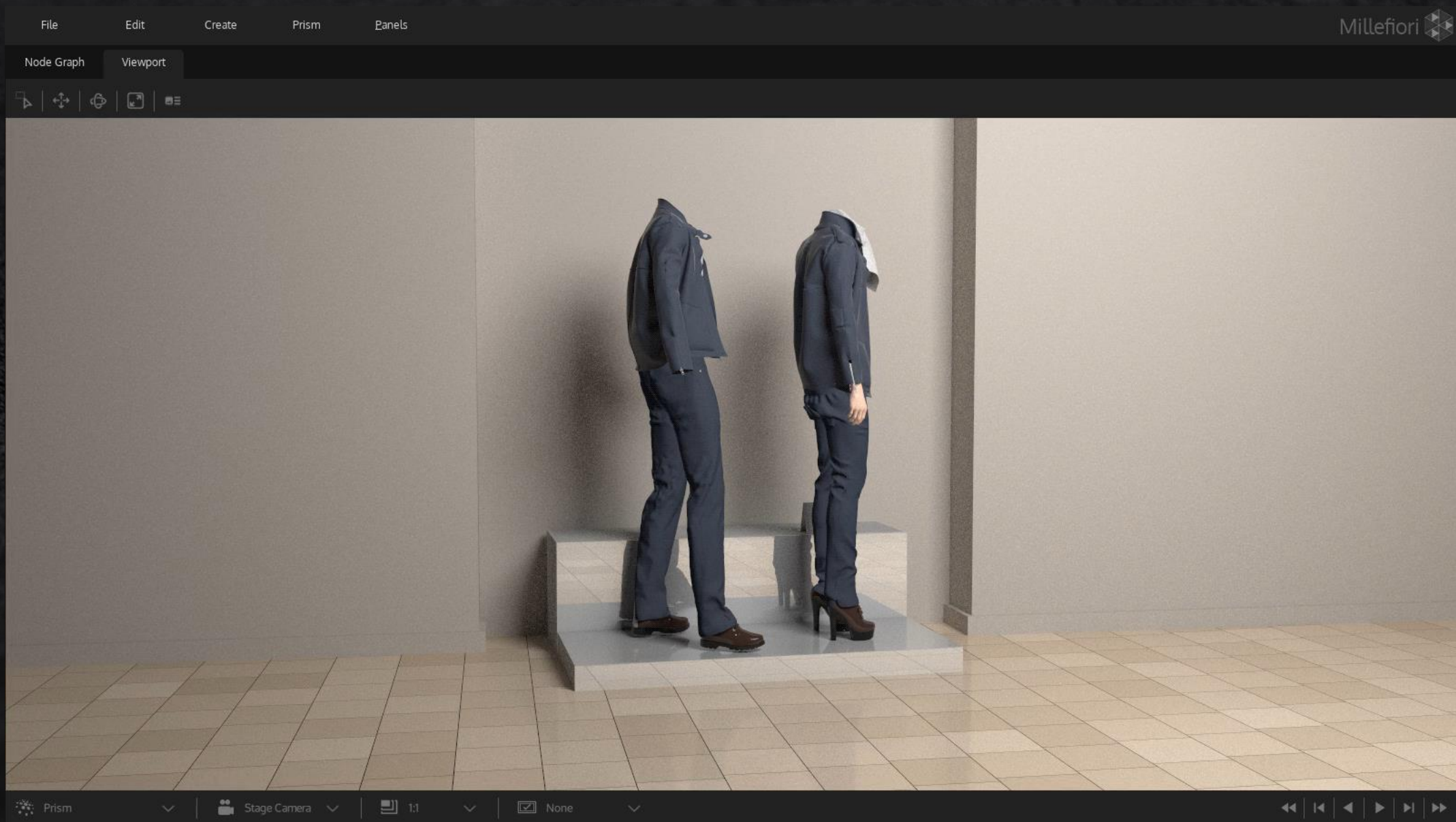


Open Shading Language in PRISM



- Fully supported with some OSL GPU limitations
 - No strings on multi GPU
 - No textures

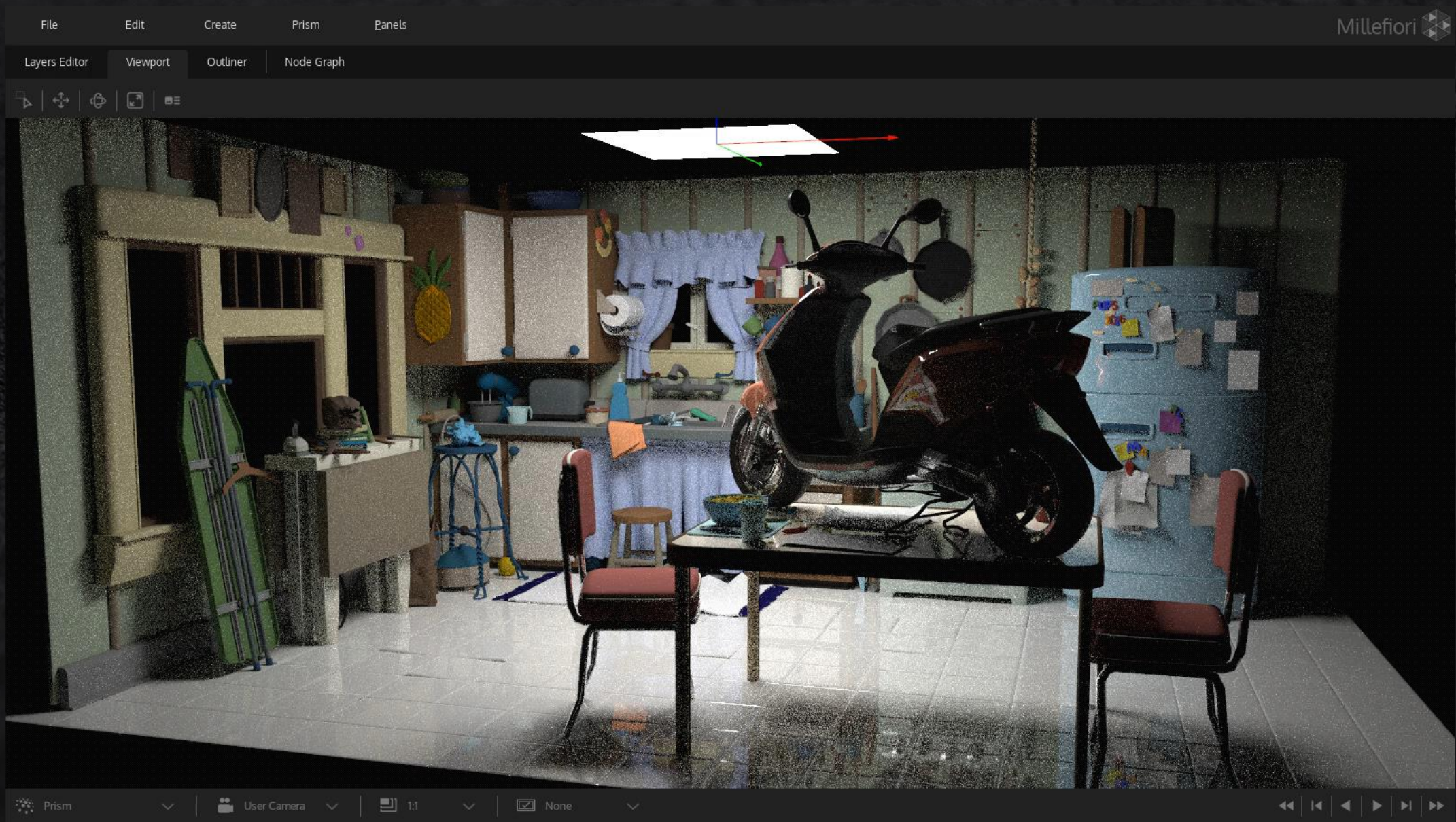




Supported lights using PRISM

- 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



Credits and Special Thanks

Technicolor Research and Innovations

(Heqi Lu, Sourimant Gael, Achibet Merwan, Tariolle Francois-Louis, Hirtzlin Patrice)

Also special thanks to the excellent support of NVIDIA which allow us the ability not to have to worry about low-level development.

(Detlef Roettger, Keith Morley, Eric Enderton, David Hart)







QUESTIONS?





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