NVIDIA®

FX Composer 2

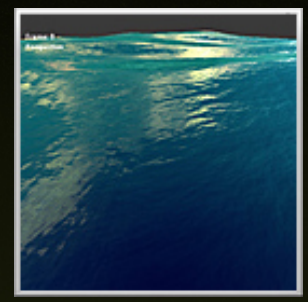
Will Ramey

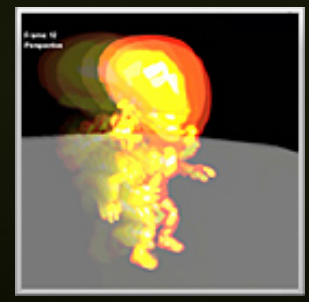
Introduction

- Recap of FX Composer 1.8
- New features of FX Composer 2

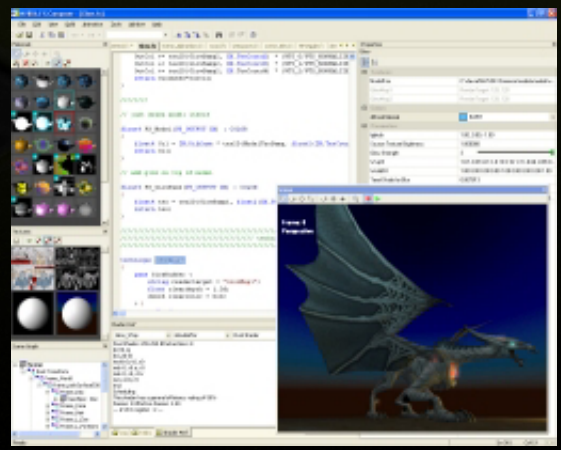
FX Composer

- **CREATE** your shaders in a high powered IDE
  - Native support for HLSL .FX development
  - Render-to-texture effects
  - Save out pre-rendered (“baked”) textures
- **DEBUG** your shaders with visual shader debugging
  - Unique real-time preview of intermediate targets
  - Import your own geometry, complete with animation
- **TUNE** your shader performance with advanced analysis
  - Vertex & pixel shader performance metrics
  - GPU-specific scheduling & disassembly via NVShaderPerf

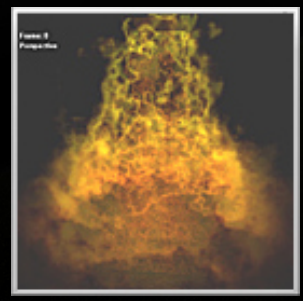




Full plug-in SDK and scripting support for automation



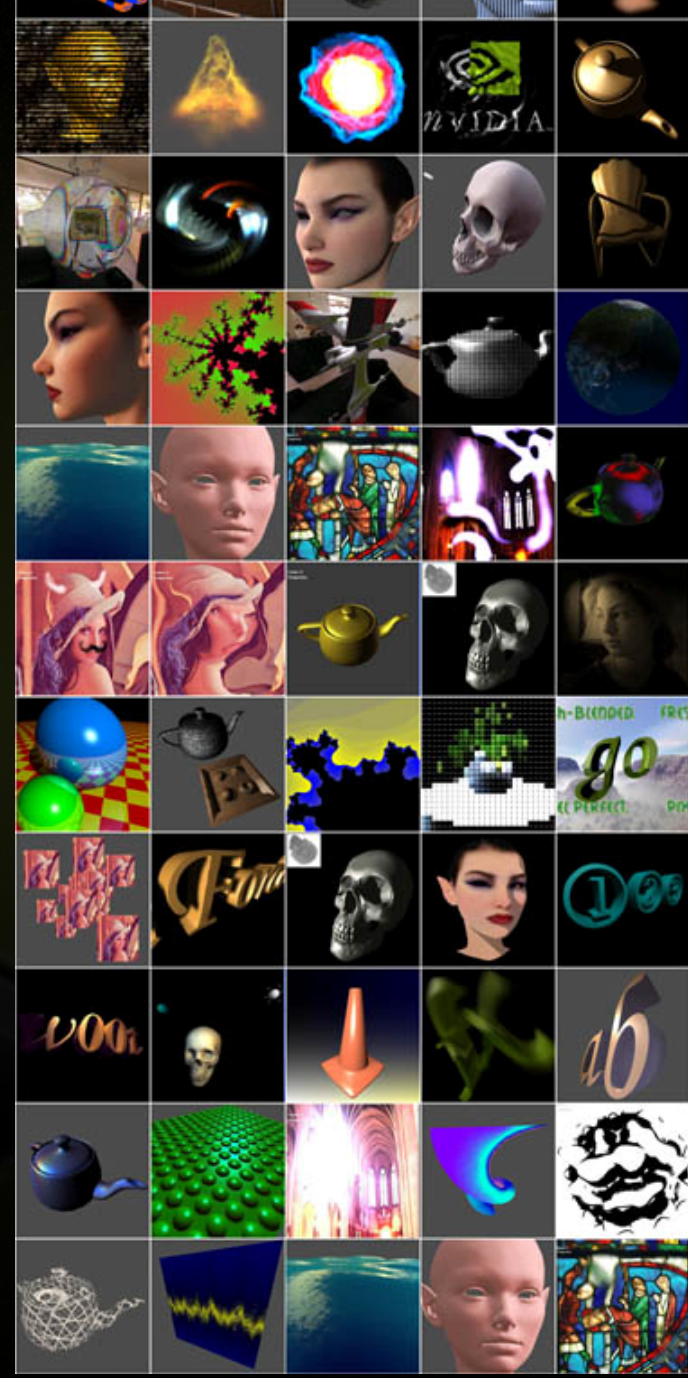
gamedeveloper FRONTLINE FINALIST '04



EverQuest® content courtesy
Sony Online Entertainment Inc.

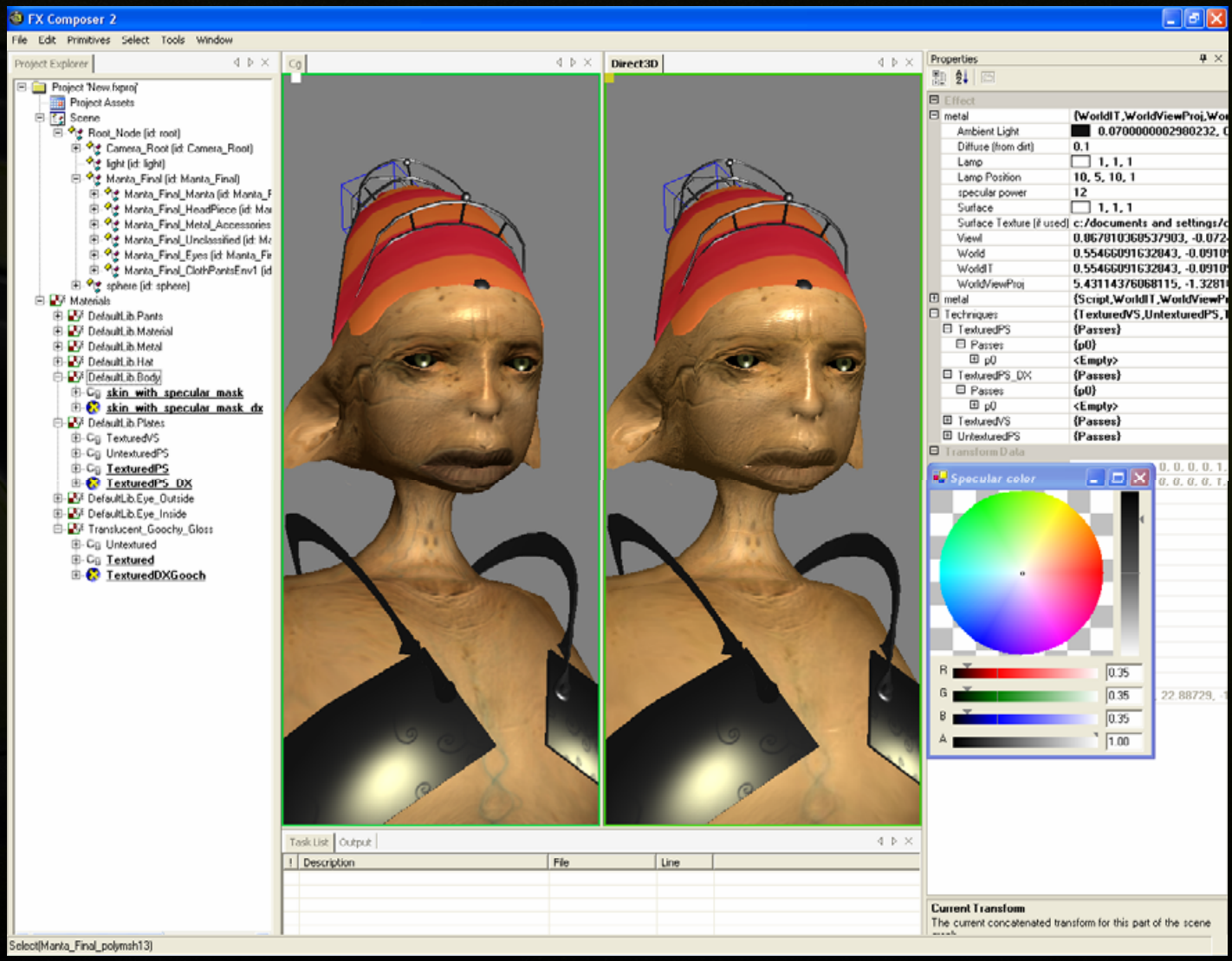
Shipping Effects

- Part of the NVIDIA Developer Toolkit
- 200+ effects and projects
- Copy them, steal them, use them!
  - Standards
    (phong, metal, plastic…)
  - Special effects
    (bloom, glow, blur,…)
  - Research shaders
    (ray tracing, texture filtering,
    volume rendering, ...)



Some of the 200+ NVIDIA SDK Projects

FX Composer 2



Major Update

- Improved user interface
  - Better support for floating, docking panels
  - Improved plug-in integration, layout management.
- Updated engine
  - More generalized & efficient pipeline
  - C#/.NET core
- Multiple device and shader format support
  - First class support for CgFX, HLSL, and GLSL
    - Any back end you like
- Collada project file support
  - More complex geometry types like n-gons, multiple index sets, etc.

New Plug-in Architecture

- Entire application is a hierarchy of plug-ins
  - Even the main window is a plug-in
- Developers can extend the application in numerous ways
  - Custom UI
  - Import/Export
  - Different Devices
  - Geometry generation

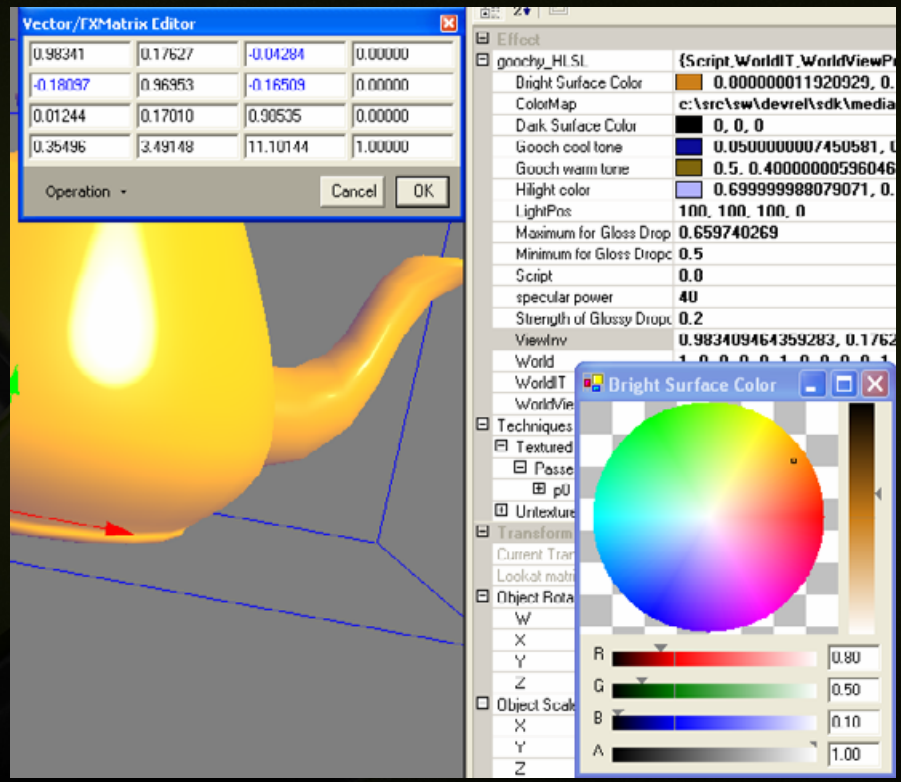
```
<fxplugin>

    <assembly name = "FXComposer.UI.MainWindow.dll"/>
    <assembly name = "../WindowContainer/FXComposer.UI.WindowContainer.dll"/>
    <assembly name = "../FXComposer.UI.ProjectExplorer.dll"/>
    <assembly name = "../FXComposer.UI.TaskList.dll"/>
    <assembly name = "../FXComposer.UI.Log.dll"/>

    <virtualdirectory path="fxcomposer/windowcontainers/mainwindow">
        <class name="FXComposer.UI.WindowContainer.WindowContainer">
            <initialstate maximized="true" width="640" height="480"/>
            <defaultlayout name="data/defaultlayout.xml"/>
            <windowname name="FX Composer 2"/>
        </class>
        <class name="FXComposer.UI.MainWindow.CmdStartup"/>
    </virtualdirectory>
```

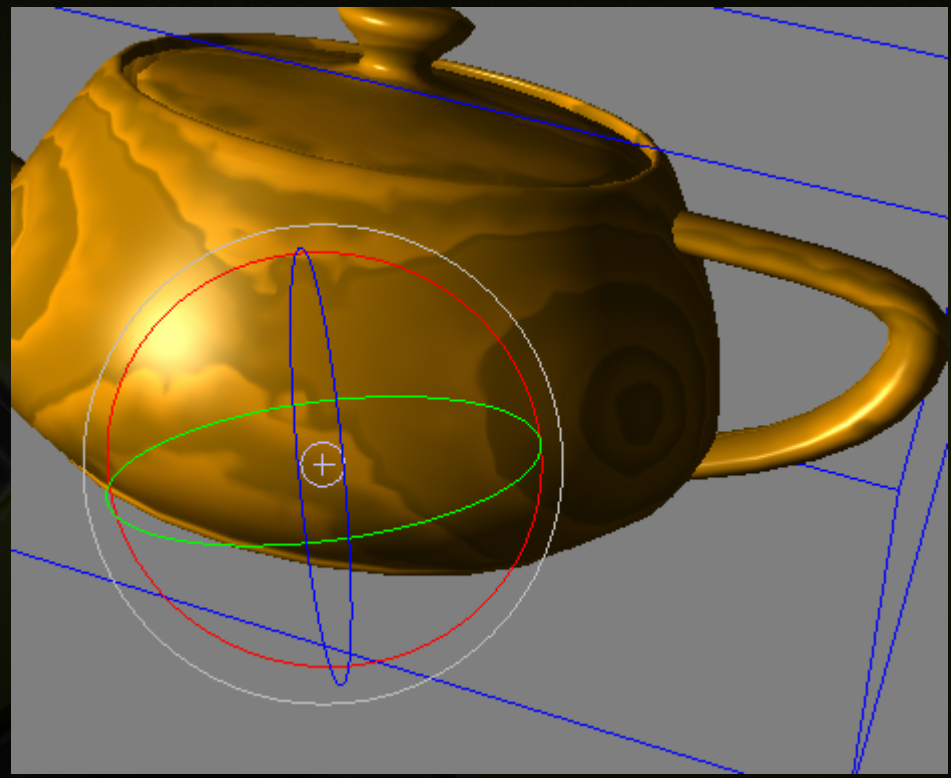
UI Improvements

- Dock windows are plug-ins
  - Developers can integrate their own into the system
- Enhanced property window supports HDR + Alpha color picking, improved matrix editing and tweaking of parameters.



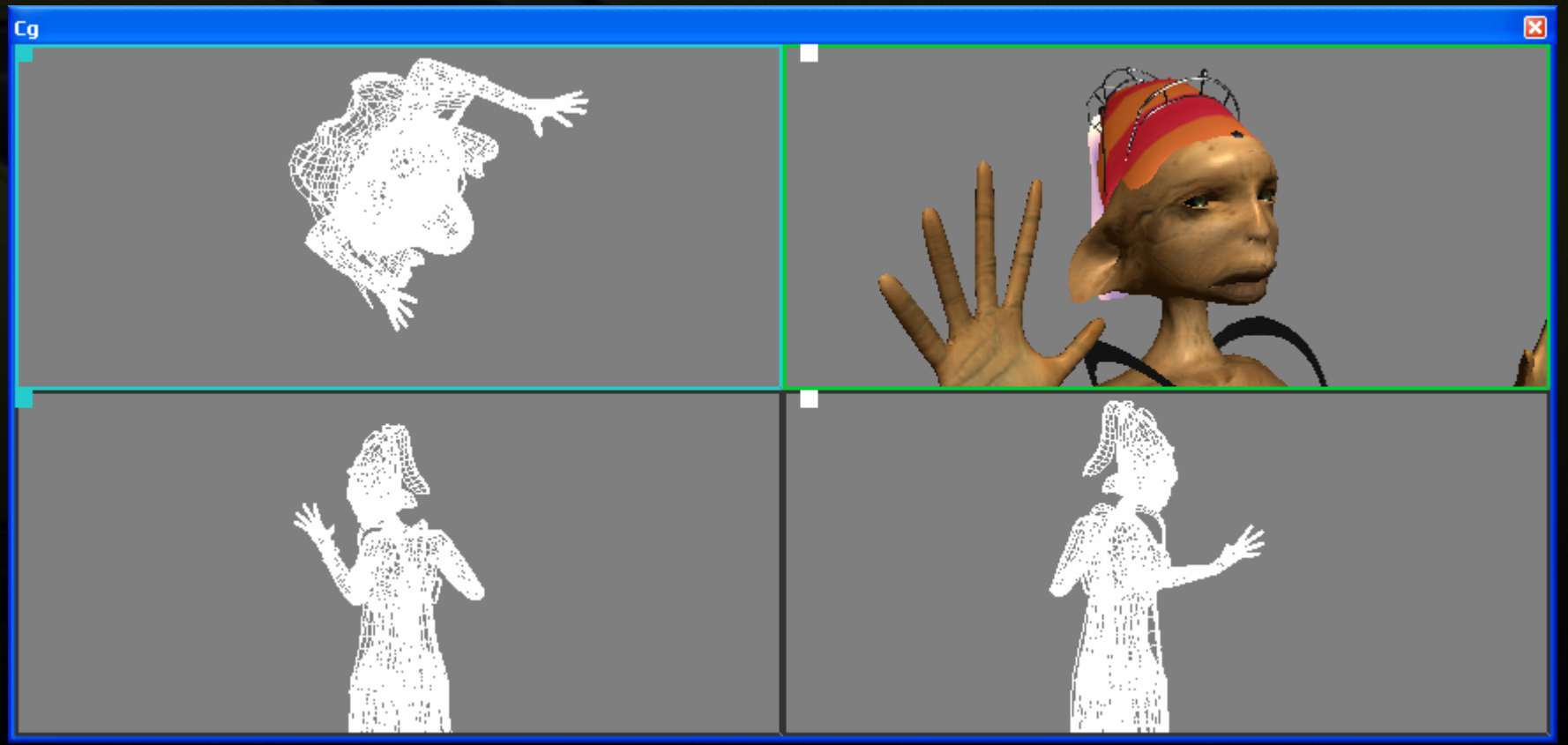
UI Improvements (2)

- Manipulator widgets make it easier to adjust the scene
- Full Undo/Redo supported for all UI actions
- Drag & Drop Everything

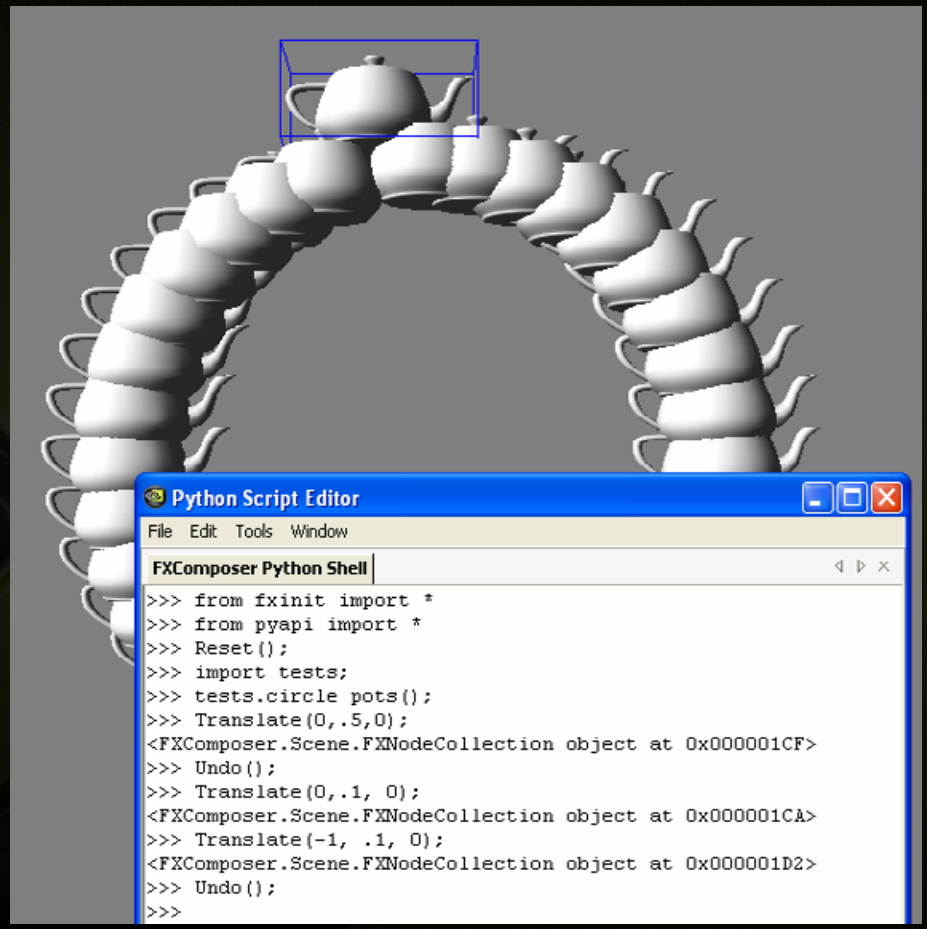


UI Improvements (3)

- Multiple Viewports



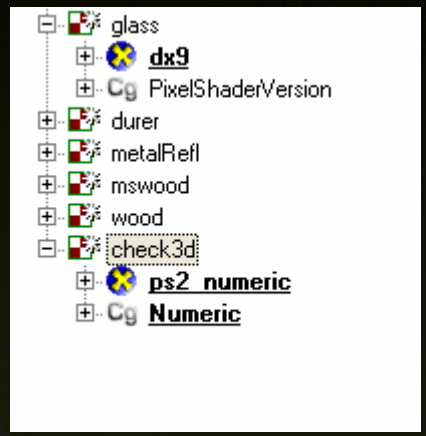
Scripting

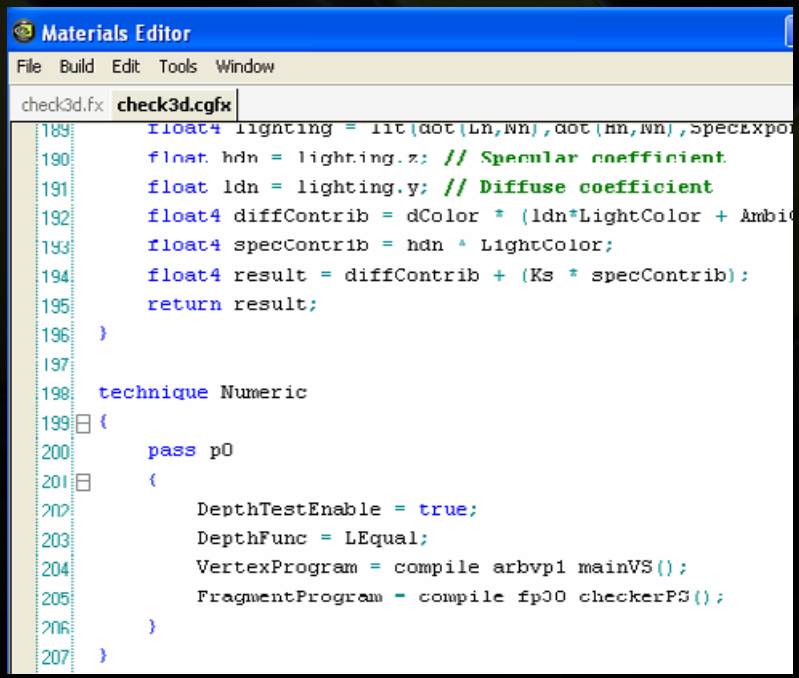


- Interactive scripting using Python.NET
  - Can modify the scene dynamically
  - Test ideas, run simple scripts
- Old style C# scripts still supported
  - But now ‘native’ since the whole engine works this way

New Shader Support

- Cg, HLSL & GLSL
  - And any others…
- Materials are now made up of a collection of device shaders





- API independent editing
  - Edits different shader types
  - Different syntax highlight rules
  - Compile/Check errors
- New features
  - Block collapse, bookmarks,etc.

CgFX 1.4

- CgFX 1.4 support works just like the D3DX Effect support in current FX Composer
- Edit effects, compile and get errors
- Build procedural textures
- Tweak parameters
- Get performance data
- We will also ship a library of CgFX effects

COLLADA Support

- FX Composer 1.x used its own XML project format
  - Proprietary, nobody liked it…
  - Limited scope
- FX Composer 2.0 uses COLLADA for its project format
  - Industry standard (Khronos Group)
  - Documented, with available viewers/tools
  - Good DCC support, and improving every day
    - The best way to get data out of your favourite tool…

COLLADA Support (2)

- Supported versions of COLLADA Schema will be 1.4+, including
  - Animation
  - Skinning
  - Geometry
  - Lights
  - Cameras
  - Effects
    - Cg
    - HLSL
    - GLSL
    - RenderTarget for full screen effects.
- Not intending to support < 1.4 versions of the COLLADA Schema

COLLADA Support (3)

- When using D3DXEffects & CgFX Effects…
  - Translated into/out of COLLADA file
  - FX Composer can then output a COLLADA file based on these effects
- COLLADA files enable URL references. Example usage:
  - DCC App loads COLLADA scene
  - FX Composer loads referenced COLLADA effect
  - FX Composer modifies effect
  - DCC App has reference to effect and can update it

XSI & FX Composer 2 COLLADA Demo

- Softimage with COLLADA + CgFX 1.4 support
- Easy to move effects and geometry back and forth, and tweak parameters.

The Source for GPU Programming

developer.nvidia.com

- Latest News
- Developer Events Calendar
- Technical Documentation
- Conference Presentations
- GPU Programming Guide
- Powerful Tools, SDKs and more ...

Join our FREE registered developer program for early access to NVIDIA drivers, cutting edge tools, online support forums, and more.

NVIDIA

developer.nvidia.com

©2004 NVIDIA Corporation. NVIDIA, and the NVIDIA logo are trademarks and/or registered trademarks of NVIDIA Corporation. Nalu is ©2004 NVIDIA Corporation. All rights reserved.