



*n*VIDIA®

FX Composer 2

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Introduction

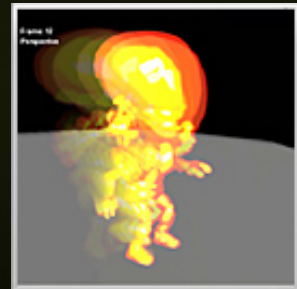
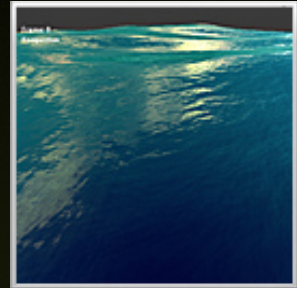


- **Recap of FX Composer 1.8**
- **New features of FX Composer 2**

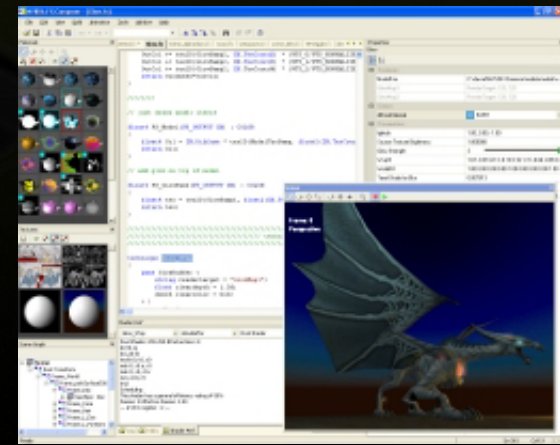
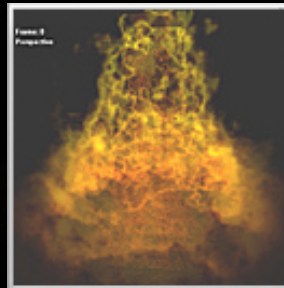
FX Composer



- **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



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, ...)



NVIDIA Developer Toolkit

- **NVIDIA SDK 9.5**
Hundreds of examples for OpenGL and DirectX
- **NVPerfKit 1.0**
GPU / driver statistics for OpenGL and DirectX
- **NVPerfHUD 3.1**
Identify and crush performance bottlenecks using freeze-frame and advanced state inspectors
- **NVShaderPerf for ForceWare 77.72**
- **FX Composer 1.7**
CREATE, DEBUG and TUNE your shaders in a high-powered IDE
- **Melody 1.2**
Generate high-quality normal maps
- **NVIDIA Handheld SDK 1.0.2**
- **GPU Programming Guide**
- **Videos, Presentations, and more...**
- **gDebugger Trial Version**
Real time debugging and profiling for OpenGL
- **Intel® VTune™ Special Offer**

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

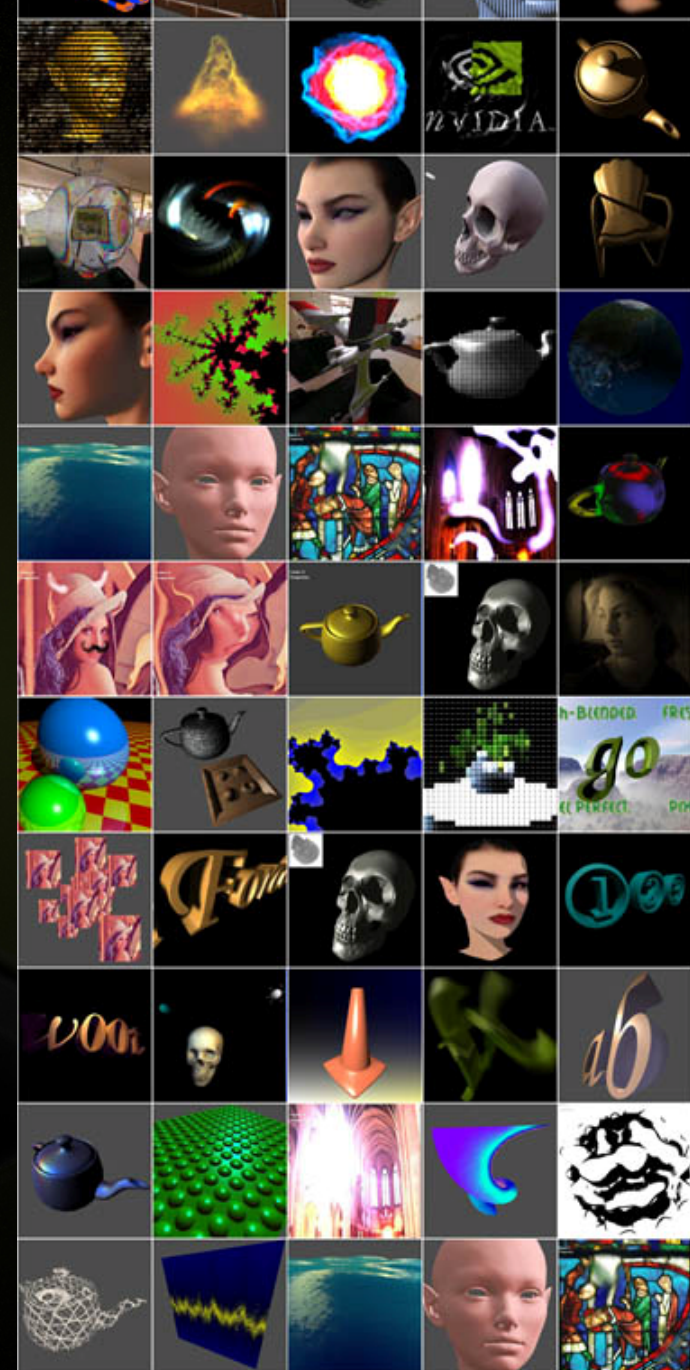
developer.nvidia.com
The Source for GPU Programming

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FX Composer 1.7

NVPerfHUD 3.1

NVIDIA SDK 9.5



Some of the 200+ NVIDIA SDK Projects



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>

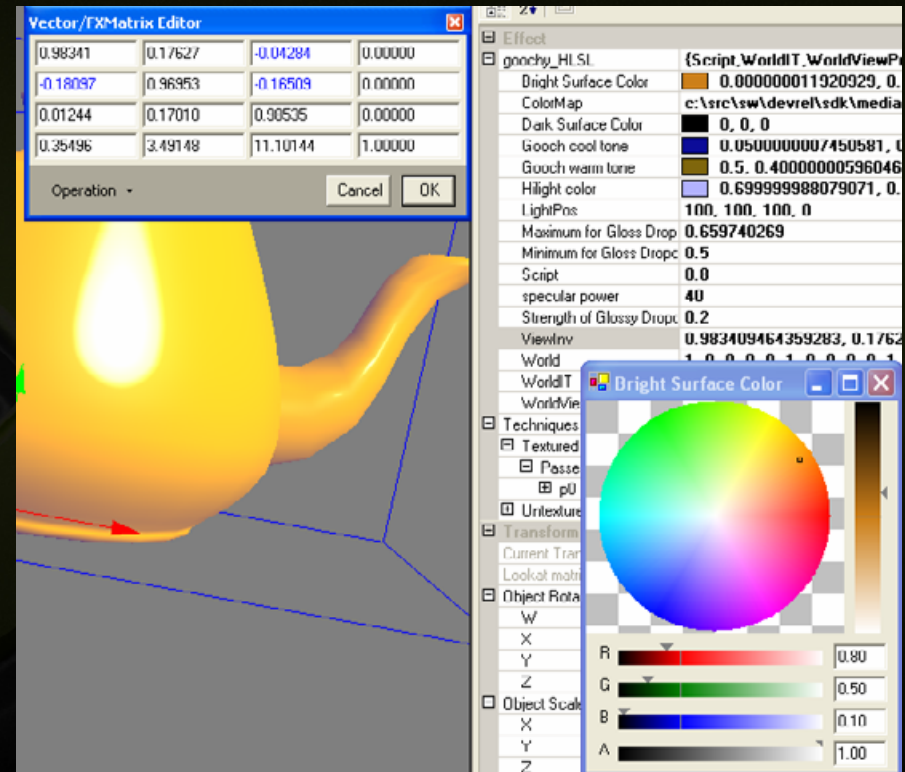
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  <assembly name = "../WindowContainer/FXComposer.UI.WindowContainer.dll"/>
  <assembly name = "../FXComposer.UI.ProjectExplorer.dll"/>
  <assembly name = "../FXComposer.UI.TaskList.dll"/>
  <assembly name = "../FXComposer.UI.Log.dll"/>

  <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



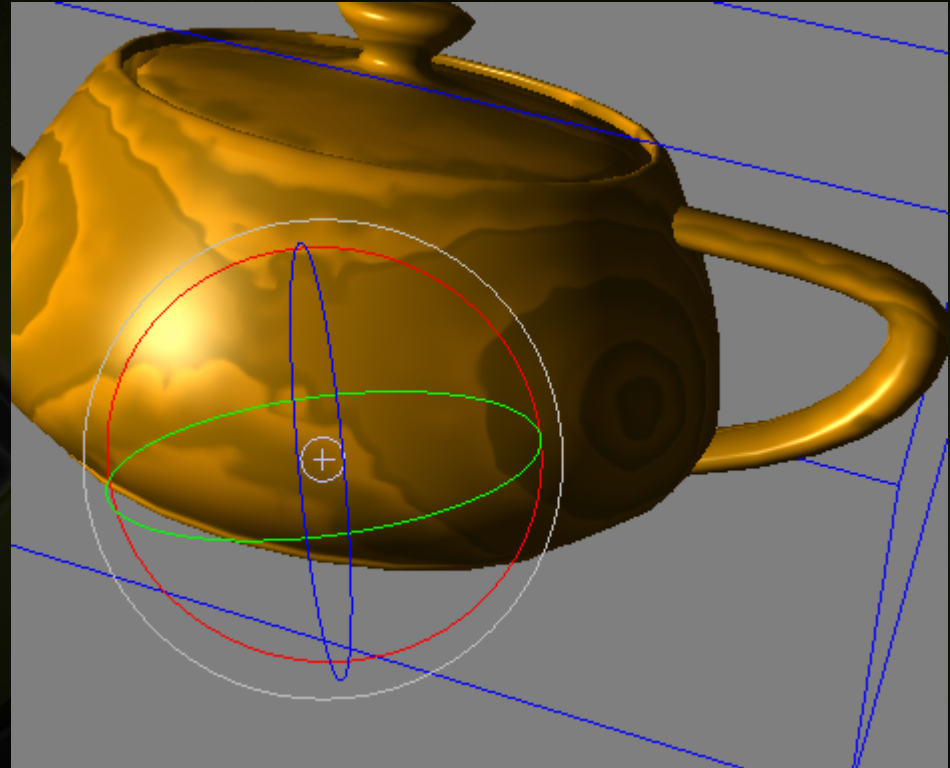
- Dock windows are plug-ins
- Developers can integrate their own into the system
- Enhanced property window supports HDR + Alpha color picking, improved matrix editing and tweaking of parameters.



UI Improvements (2)



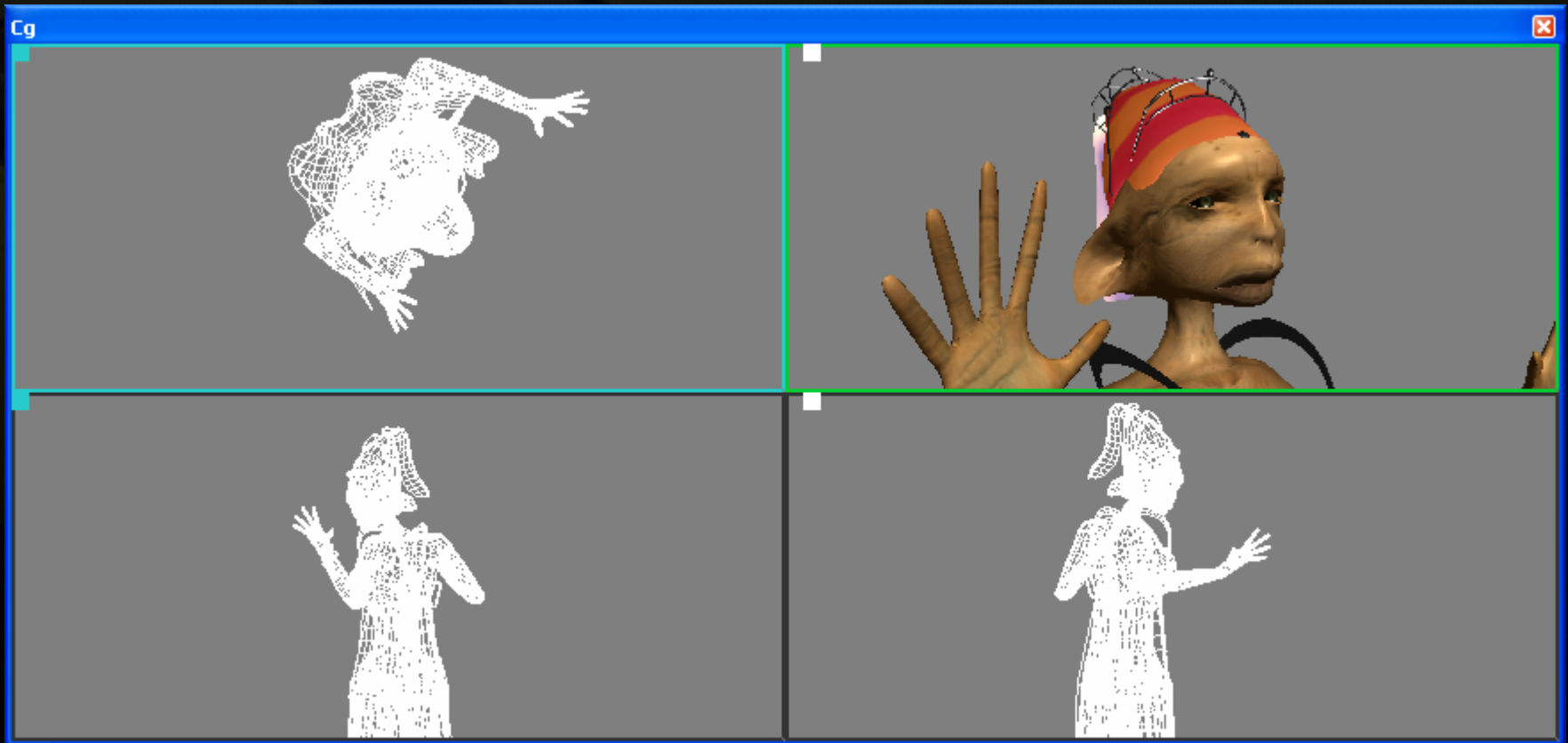
- Manipulator widgets make it easier to adjust the scene
- Full Undo/Redo supported for all UI actions
- Drag & Drop Everything



UI Improvements (3)



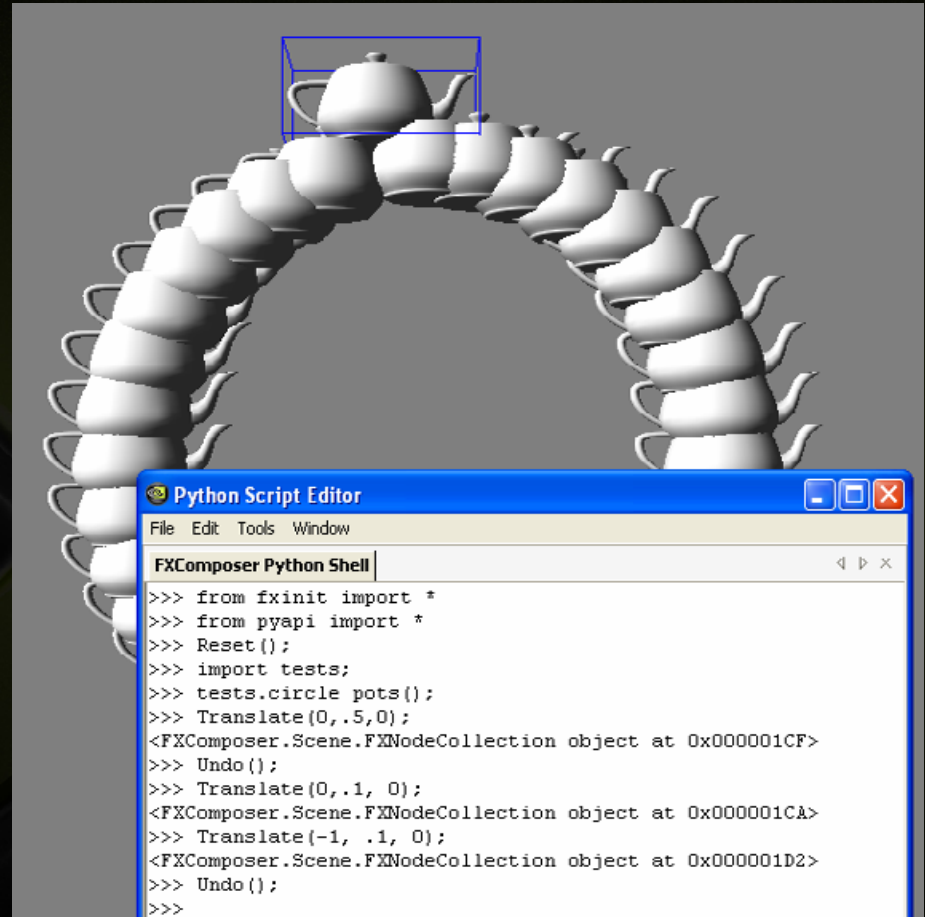
● Multiple Viewports



Scripting



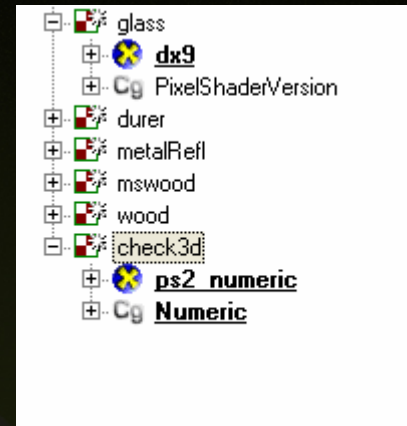
- **Interactive scripting using Python.NET**
 - Can modify the scene dynamically
 - Test ideas, run simple scripts
- **Old style C# scripts still supported**
 - But now 'native' since the whole engine works this way



New Shader Support



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



```
Materials Editor
File Build Edit Tools Window
check3d.fx check3d.cgfx
189 float4 lighting = lit(dot(Ln,Wn),dot(Wn,Wn),SpecExpor
190 float hdn = lighting.z; // Specular coefficient
191 float ldn = lighting.y; // Diffuse coefficient
192 float4 diffContrib = dColor * (ldn*LightColor + Ambie
193 float4 specContrib = hdn * LightColor;
194 float4 result = diffContrib + (Ks * specContrib);
195 return result;
196 }
197
198 technique Numeric
199 {
200     pass p0
201     {
202         DepthTestEnable = true;
203         DepthFunc = LEqual;
204         VertexProgram = compile arbvpl mainVS();
205         FragmentProgram = compile fp30 checkerPS();
206     }
207 }
```

- 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

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- Developer Events Calendar
- Technical Documentation
- Conference Presentations
- GPU Programming Guide
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