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## **NVIDIA SDK** The Source for GPU Programming



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Hundreds of code samples and effects that help you take advantage of the latest in graphics technology.

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### SDK Browser

Search, sort and find exactly what you need

### Practical Code Samples & Compelling Effects

- •Video Filtering
- •Antialiasing with Post-processing
- •Deferred Shading
- •Geometry Instancing
- •250+ compelling effects



Be sure to check out the complete User Guide and helpful tutorials! Also the full presentation dedicated to FX Composer.

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### CREATE your shaders in a high powered development environment

Sophisticated text editing with intellisense (auto-complete) and syntax highlighting Work directly with HLSL .FX files, creating multiple techniques and passes Use the .FX files you create with FX Composer directly in your application Convenient, artist-friendly graphical editing of shader properties Supports Microsoft DirectX standard HLSL semantics and annotations Support for all DirectX 9.0 shader profiles Develop your shaders on your own models with lighting and animation

### DEBUG your shaders with visual shader debugging features

Interactive compiler helps you find and fix problems Visible preview of source and intermediate textures targets Interactive jump-to-error feature helps you fix problems quickly

### TUNE your shader performance with advanced analysis and optimization

Enables performance tuning workflow for vertex and pixel shaders Simulates performance for the entire family of GeForce FX GPUs Capture of pre-calculated functions to texture look-up table Provides empirical performance metrics such as GPU cycle count, register usage, utilization rating, and FPS.

Optimization hints notify you of performance bottlenecks



### Goes-in-to

Supports all DirectX texture formats. Import scene data from .obj, .x, .ply, or .x files.

### Comes-out-of

Use the Shader Perf panel to optimize your shaders. Save properties sets as XML files (re-apply in engine). Save textures generated by HLSL functions (e.g. noise). Package shaders, textures & full scene in one file for review/collaboration.

### SDK for automation & custom importers/exporters

Sample code for custom importers & exporters Save properties bundles in your own format Automate just about anything using .NET scripting (e.g. screenshots for all shaders in a directory)



### **Photoshop Plug-ins**

Allows saving in various formats, incl. DXTC (.dds files) Generate mip-maps in variety of ways

(box filter to Kaiser gamma-space filter)

Preview w/ 3D rendering options

(e.g. anisotropy, format comparisons etc.)

Create normal maps from height maps

### nvDXT & mip map utilities

Command line interface for pipeline automation Available .lib for tools integration Detatach & Stitch utils to manipulate mip maps

### **DDS Thumbnail Viewer**

Provides convenient preview of DXT compressed files.

See Texture Atlas whitepaper for details...



### **NVMeshMender:**

Creates tangent basis for per-pixel lighting Creates smoothed normals Creates u, v coordinates Handles mirrored (u,v) and cylindrical wrapping

### NVTriStrip (library):

Library to stripify arbitrary geometry meshes Flexibly optimizes for postTnL vertex caches Option to stitch strips using degenerate triangles Option to remap indices to improve vertex buffer locality Outputs lists or strips



Head model (right side of slide)

- Left: 18k poly reference model
- Right: 4k poly working model (auto simplified using progressive mesh deformation algorithm)

Notice the different view modes on the right. From top to bottom:

- 1. Filled
- 2. Textured
- 3. Chart View
- 4. Object Space Normals

Reference Model 3890	8 Faces	Set # F	aces	2000 Faces
Load Working Model C:\Program Files\N	/IDIA Corporation\Melody\examples\	bustier_lo.3ds	1	Display Both Models 🛛 🔽
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	Fit To Reference Model	Fitting Settings	Save Current M	odel Load Current Model

### Dawn's Bustier

Left 38K polygons

Right 2K polygons with Melody normal map

### Can you tell the difference?

### Visualization Options Include:

- •Vertex or per-pixel normals (textured or not)
- •Charts & attribute groups
- •Tangent to object space
- •Tangent or object space light mapping
- •Combined with Filled, Wireframe or Outlined mode



Often takes longer to load the model than generate the normal map!

### Goes-in-to

Import models from .obj, .3ds or .ply files. Import a low-res model or generate LODs using Melody

### Comes-out-of

Multiple LODs () Normal map file for each low-res model (tons of options) Object space and tangent space normal maps FP support (8 or 32 bits / channel) Displacement maps Re-sampled color map (normal & color) Greyscale Height map Generates ambient occlusion term

### **Visual Preview**

Simple object manipulation Powerful visualization modes



Be sure to check out the full User Guide!





Different version for each version of NVIDIA drivers.

### Identify shader performance issues:

Run once across all your shaders to create a baseline report. Run the same version again later to identify which shaders have improved / degraded performance.

### Identify driver performance issues:

Run once across all your shaders to create a baseline report. Then run a different version on the same shaders. improvements and/or regressions. *Let us know if you find any driver performance issues!!* 

# **Questions / Feature Requests?**



All of this and more, available now at no cost to you!

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Please send questions, feature requests & comments about our SDK and developer tools to:

sdkfeedback@nvidia.com

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