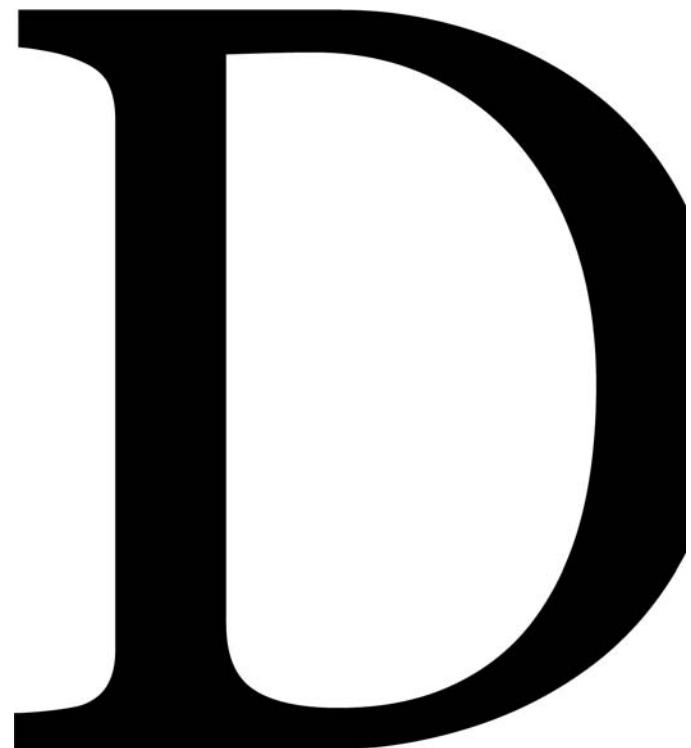


drUtilSuite_v101



drUtilSuite_v101 for mental ray.

drUtilSuite_v101

Suite drUtilSuite_v101

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Publication Date

November 25, 2007

Legal Information

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Suite drUtilSuite_v101

Introduction

The drUtil suite of mental ray shaders expands the set of basic shaders available to shader writers, lighters, technical directors, and 3d artists in general. The suite is primarily focused on use within Autodesk's Maya but can be used in any package that supports mental ray.

The drUtil suite consists of several groups of shaders. Those groups are listed here and described in the following pages.

- Logic Shaders
- Conversion Shaders
- Utility Shaders
- Layer Shaders
- Math Shaders
- State Shaders
- Lens Shaders
- Geometry Shaders
- Light Shaders
- Environment Shaders
- Debug Illumination Shaders
- Multipass Shaders
- Surface Component Shaders

The drUtil suite is available on Windows, Linux, and MacOSX for ray 3.4 and 3.5.

There is overlap between the functionality provided by the drUtil suite of shaders and the base shaders and utility nodes already available in mental ray and Maya. Where there was a question of implementing a feature due to pre-existing coverage, completeness of coverage was favored over minimizing redundancy.

Installation Instructions

Maya 7.0 and mental ray 3.4

First, copy the files in the `mentalray\include` directory into your Maya `mentalray\include` directory.

Second, copy the files in the `mentalray\shader\platform` (platform is win, linux, or mac) directory into your Maya `mentalray\lib` directory.

The drUtilSuite can be made to integrate better with Maya by installing the files in the `mentalray\maya` directory.

An example `maya.rayrc` is included in the `mentalray\maya` directory of the drUtilSuite_v101 package.

Now, in a text editor, add the following lines to the `mentalray\maya.rayrc` file, and to the `mentalray\ray3rc` file if you have one.

```
link "drUtilShaders1.01.{DSO}"
mi "drUtilShaders1.01.mi"
```

The files in the `mentalray\maya\icons`

The files in the `mentalray\maya\others` directory should be copied into your Maya `scripts\others` directory. These files will replace files of the same name, `mentalrayCustomNodeClass.mel` and `mentalrayCustomNodeUI.mel`. Copies of those files as originally distributed with Maya 7.0 are include in this directory as `mentalrayCustomNodeClass.mel.bak0` and `mentalrayCustomNodeUI.mel`.

The files in the `mentalray\maya\AETemplates` directory should be copied into your Maya `scripts\AETemplates` directory.

Changes

2006.07.25

- Initial public release

2006.07.27

- Fixed shader export issue in Windows release.

2006.08.16

- Fixed missing symbol issue in Linux release.

2006.08.21

- Added new Conversion shaders

- drInteger2Boolean_v1
- drInteger2Scalar_v1
- drInteger2Vector_v1
- drInteger2Color_v1
- drBoolean2Integer_v1
- drScalar2Integer_v1
- drVector2Integer_v1
- drColor2Integer_v1

- Added new State Shaders

- drStateReflectionLevelScalar_v1
- drStateRefractionLevelScalar_v1
- drStateLabelScalar_v1
- drStateInstanceScalar_v1
- drStateRayTypeScalar_v1

- Added new Utility Phenomenon

- drRayTypeSelect_v1

- Moved shaders to the Deprecated list

- drStateReflectionLevel_v1
- drStateRefractionLevel_v1
- drStateLabel_v1
- drStateInstance_v1
- drStateRayType_v1

2006.11.28

- Added new Lens shaders

- drLensPanoramic_v1
- drLensGamma_v1

- Added new Utility shader

- drSetOpacity_v1

- Added new Geometry shader

- drGeomSetAreaLightType_v1

- Added example scenes demonstrating the use of

- drLensPanoramic
- drLensGamma
- drGeomSetAreaLightType_v1

2006.12.10

- Added new Environment shaders

- drEnvironmentPanoramic_v1

- Added new Math shaders

- drModColor_v2
- drModScalar_v1
- drModVector_v1

- Added debugging Illumination shaders

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```
drDebugIllumLambert_v1
drDebugLightPoint_v1
Includes source code and build projects for Win32, Linux, and OSX
- Added Multipass shaders
    drMultipassGeometry_v5
    drMultipassGeometry8_v5
    drMultipassGeometry16_v5
    drMultipassSurface_v5
    drMultipassSurface8_v5
    drMultipassSurface16_v5
    drMultipassLens_v5
    drMultipassLens8_v5
- Added example scenes demonstrating the use of
    drModColor_v2
    drMultipassGeometry_v5
    drMultipassSurface_v5
    drMultipassGeometry8_v5
    drMultipassSurface8_v5
    drMultipassGeometry16_v5
    drMultipassSurface16_v5
```

2007.01.09

- Redefined the different panoramic mappings used in the environment and lens shaders.

2007.01.11

- Added drLensBrightness_v1
- Added node ids for Multipass shaders
- Updated drUtilShaders.mi declarations to include all new files
- Updated example scenes to be a bit more friendly out of the box

2007.05.21

Util Shaders

- Added the ShadowPass shader. This shader returns the shadowing percentage for the lights in the scene.
- Added Floor and Ceiling math shaders to the Color Suite
- Added the State Texture Coordinate shader
- Added Select Vector scalars

- Boost library is now statically linked into library on OSX and Linux. It's no longer necessary to install the library separately on machines using the shaders.

Multipass Shaders

- Exposed samples-based Multipass writing and merging shaders
- These have not been thoroughly tested.

Debug Illum Shaders

- Updated to .mi declaration to include min version. Ray was signaling a syntax error without one.
- Updated the XCode project to include Maya 8.5/ray 3.5 Universal Binary support
- Updated the XCode project to include separate configurations for Maya 7.0, 8.0, and 8.5

2007.07.07

- Added Windows x64 support.
- Added Linux x64 support.

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2007.11.25

- Updated Multipass shaders to version 1.02.

This update includes new v6 editions of the Multipass geometry shaders, which have the follow features

- Added a "frameNumber" parameter which can be used to add frame numbers into file names. The '#' character will be replaced by the frame number, padded with as many zeroes as there are '#' characters.
- Resolved an issue that was causing the 16 frame buffer shaders to compute all frame buffers regardless of whether or not they were written to disk. This node behavior has been fixed and is not in line with the behavior of the 8 frame buffer nodes.

Group Logic
Suite drUtilSuite_v101

The Logic Shaders group provide shader level implementations of standard logic operations. The shaders names in this group should be fairly indicative of each shader's functionality.

The Logic Shaders are

```
drAnd_v1
drAnd_v2 - Array
drOr_v1
drOr_v2 - Array
drXOr_v1
drNot_v1
drEqualScalar_v1
drNotEqualScalar_v1
drEqualColor_v1
drNotEqualColor_v1
drEqualVector_v1
drNotEqualVector_v1
drGreaterThanOrEqualScalar_v1
drLessThanScalar_v1
drLessThanOrEqualScalar_v1
drGreaterThanOrEqualColor_v1
drLessThanColor_v1
drLessThanOrEqualColor_v1
drGreaterThanOrEqualVector_v1
drLessThanVector_v1
drLessThanOrEqualVector_v1
drInRangeColor_v1
drInRangeScalar_v1
drInRangeVector_v1
drIsObject_v1
drInRasterPositionRange_v1
drInBetweenVector_v1
drIfThenElseScalar_v1
drIfThenElseColor_v1
drIfThenElseVector_v1
```

Group Conversion
Suite drUtilSuite_v101

The Conversion Shaders group provide shader-level implementations of conversions between the different standard data types within mental ray, namely Color, Vector, Scalar, and Boolean. The shaders names in this group should be fairly indicative of each shader's functionality.

The Conversion Shaders are

```
drColor2Vector_v1  
drColor2Scalar_v1  
drColor2Scalars_v1  
drColor2Boolean_v1  
drVector2Color_v1  
drVector2Scalar_v1  
drVector2Scalars_v1  
drVector2Boolean_v1  
drScalar2Color_v1  
drScalar2Vector_v1  
drScalar2Boolean_v1  
drScalars2Color_v1  
drScalars2Vector_v1  
drBoolean2Color_v1  
drBoolean2Vector_v1  
drBoolean2Scalar_v1  
drInteger2Boolean_v1  
drInteger2Scalar_v1  
drInteger2Vector_v1  
drInteger2Color_v1  
drBoolean2Integer_v1  
drScalar2Integer_v1  
drVector2Integer_v1  
drColor2Integer_v1
```

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Group Utility **Suite drUtilSuite_v101**

The Utility Shaders group provides an expanded set of shaders that perform commonly needed functions not provided for or not provided for cleanly already. The shaders names in this group should be fairly indicative of each shader's functionality.

The Utility Shaders are

```
drDebugColor_v1  
drDebugVector_v1  
drDebugScalar_v1  
drDebugBoolean_v1  
drNullColor_v2  
drNullScalar_v1  
drNullVector_v1  
drConstColor_v2  
drConstScalar_v1  
drConstVector_v1  
drNormalizeVector_v1  
drVectorNorm_v1  
drSelectColor_v1  
drSelectScalar_v1  
drSelectColor2_v1  
drSelectColor4_v1  
drSelectColor8_v1  
drSelectColor16_v1  
drSelectScalar2_v1  
drSelectScalar4_v1  
drSelectScalar8_v1  
drSelectScalar16_v1  
drSwitchColor_v4  
drRayTypeSelect_v1  
drSetOpacity_v1  
drSelectVector_v1  
drSelectVector2_v1  
drSelectVector4_v1  
drSelectVector8_v1  
drSelectVector16_v1
```

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Group Layer **Suite drUtilSuite_v101**

The Layer Shaders group provides allow for the manipulation of shader color channels in some of the same ways that compositing packages allow for the manipulation of image layers. The shaders names in this group should be fairly indicative of each shader's functionality.

The Layer Shaders are

```
drOver_v1  
drSwitchMatte_v1  
drMatteMult_v1  
drMatteDiv_v1  
drSetAlpha_v1  
drCopyChannelColor_v1  
drCopyChannelVector_v1  
drSetChannelColor_v1  
drSetChannelVector_v1  
drMixerColor2_v1  
drMixerColor4_v1  
drMixerColor8_v1  
drMixerColor16_v1  
drMixerScalar2_v1  
drMixerScalar4_v1  
drMixerScalar8_v1  
drMixerScalar16_v1  
drMixerVector2_v1  
drMixerVector4_v1  
drMixerVector8_v1  
drMixerVector16_v1  
drReorderColor_v1  
drReorderVector_v1
```

Group Math
Suite drUtilSuite_v101

The Math Shaders group provides shader-level implementations of common math operations for Colors, Vectors, and Scalars. The shaders names in this group should be fairly indicative of each shader's functionality.

The Math Shaders are

```
drAddColor_v2  
drAddScalar_v1  
drAddVector_v1  
drSubColor_v2  
drSubScalar_v1  
drSubVector_v1  
drSubAColor_v2  
drSubAScalar_v1  
drSubAVector_v1  
drMultColor_v2  
drMultScalar_v1  
drMultVector_v1  
drDivColor_v2  
drDivScalar_v1  
drDivVector_v1  
drMinColor_v2  
drMinScalar_v1  
drMinVector_v1  
drMaxColor_v2  
drMaxScalar_v1  
drMaxVector_v1  
drMixColor_v2  
drMixScalar_v1  
drMixVector_v1  
drClampColor_v3  
drClampScalar_v1  
drClampVector_v2  
drThresholdColor_v2  
drThresholdScalar_v1  
drThresholdVector_v1  
drCompressColor_v2  
drCompressScalar_v1  
drCompressVector_v1  
drExpandColor_v2  
drExpandScalar_v1  
drExpandVector_v1  
drInvertColor_v2  
drInvertScalar_v1  
drInvertVector_v1  
drModColor_v2  
drModScalar_v1  
drModVector_v1  
drFloorColor_v2  
drFloorScalar_v1  
drFloorVector_v1  
drCeilColor_v2  
drCeilScalar_v1  
drCeilVector_v1
```

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Group State **Suite drUtilSuite_v101**

The State Shaders group provides shader-level access to some of the variables that are defined as each point on a surface is shaders. The shaders names in this group should be fairly indicative of each shader's functionality.

The Math Shaders are

```
drStateRasterPos_v1  
drStateOrg_v1  
drStateDir_v1  
drStatePoint_v1  
drStateNormal_v1  
drStateGeometricNormal_v1  
drStateMotion_v1  
drStateRasterX_v1  
drStateRasterY_v1  
drStateRasterWidth_v1  
drStateRasterHeight_v1  
drStateDist_v1  
drStateTime_v1  
drStateDotND_v1  
drStateInvNormal_v1  
drStateReflectionLevel_v1  
drStateRefractionLevel_v1  
drStateLabel_v1  
drStateInstance_v1  
drStateReflectionLevelScalar_v1  
drStateRefractionLevelScalar_v1  
drStateLabelScalar_v1  
drStateInstanceScalar_v1  
drStateRayTypeScalar_v1  
drStateTextureCoord_v1
```

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Group Lens **Suite drUtilSuite_v101**

The Lens Shaders group provides shader-level implementations of operations useful to apply to lenses. The shaders names in this group should be fairly indicative of each shader's functionality.

drLensPanoramic_v1
drLensGamma_v1

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Group Geometry **Suite drUtilSuite_v101**

The Geometry Shaders group provides functionality not necessarily exposed in the mental integration provided by each application. The shaders names in this group should be fairly indicative of each shader's functionality.

drGeomSetAreaLightType_v1

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Group Light **Suite drUtilSuite_v101**

The Light Shaders group provides implementations of lights not covered in the standard mental ray distribution. The shaders names in this group should be fairly indicative of each shader's functionality.

drParticleLight_v1

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Group Environment

Suite drUtilSuite_v101

The Environment Shaders group provides implementations of environment map types not covered in the standard mental ray distribution.

drEnvironmentPanoramic_v1

drUtilSuite_v101

Group Debug Illumination

Suite drUtilSuite_v101

The Debug Illumination Shaders group provides implementations of basic illumination nodes, lambert and point light, that will print out debug information. These can be useful in debugging mental ray scenes. The shaders names in this group should be fairly indicative of each shader's functionality.

drDebugIllumLambert_v1
drDebugLightPoint_v1

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Group Multipass
Suite drUtilSuite_v101

The Multipass Shaders group provides implementations of geometry, lens, and surface shaders that allow users to take advantage of mental ray's native support for rendering multiple frame buffers in a single render.

The lens shaders included in this group aren't needed, from an end-user perspective. The geometry shader will create the lens shader at render time, thereby removing one extra setup step. Example scenes in the examples\maya\scenes directory provide an example scene setup.

```
drMultipassGeometry_v5
drMultipassGeometry8_v5
drMultipassGeometry16_v5
drMultipassSurface_v5
drMultipassSurface8_v5
drMultipassSurface16_v5
drMultipassLens_v5
drMultipassLens8_v5
drMultipassSamplesMerge_v1
drMultipassGeometrySamplesWrite_v1
drMultipassGeometrySamplesMerge_v1
drMultipassGeometry_v6
drMultipassGeometry8_v6
drMultipassGeometry16_v6
```

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Group Surface Component Suite drUtilSuite_v101

The Surface Component Shaders group provides implementations of shaders that compute individual components of material properties.

drShadowPass_v1