Platform-independent shader development with mental mill®: the making of Dead Rising 2

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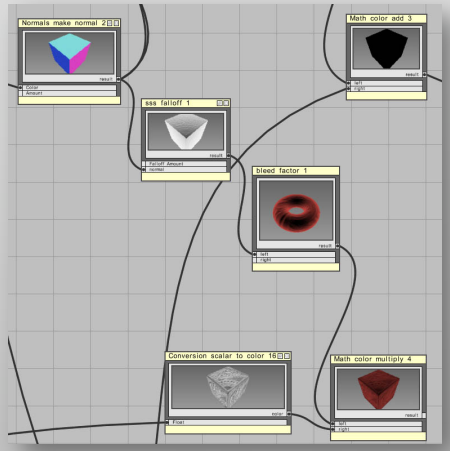
Platform-independent shader development with mental mill®: the making of Dead Rising 2

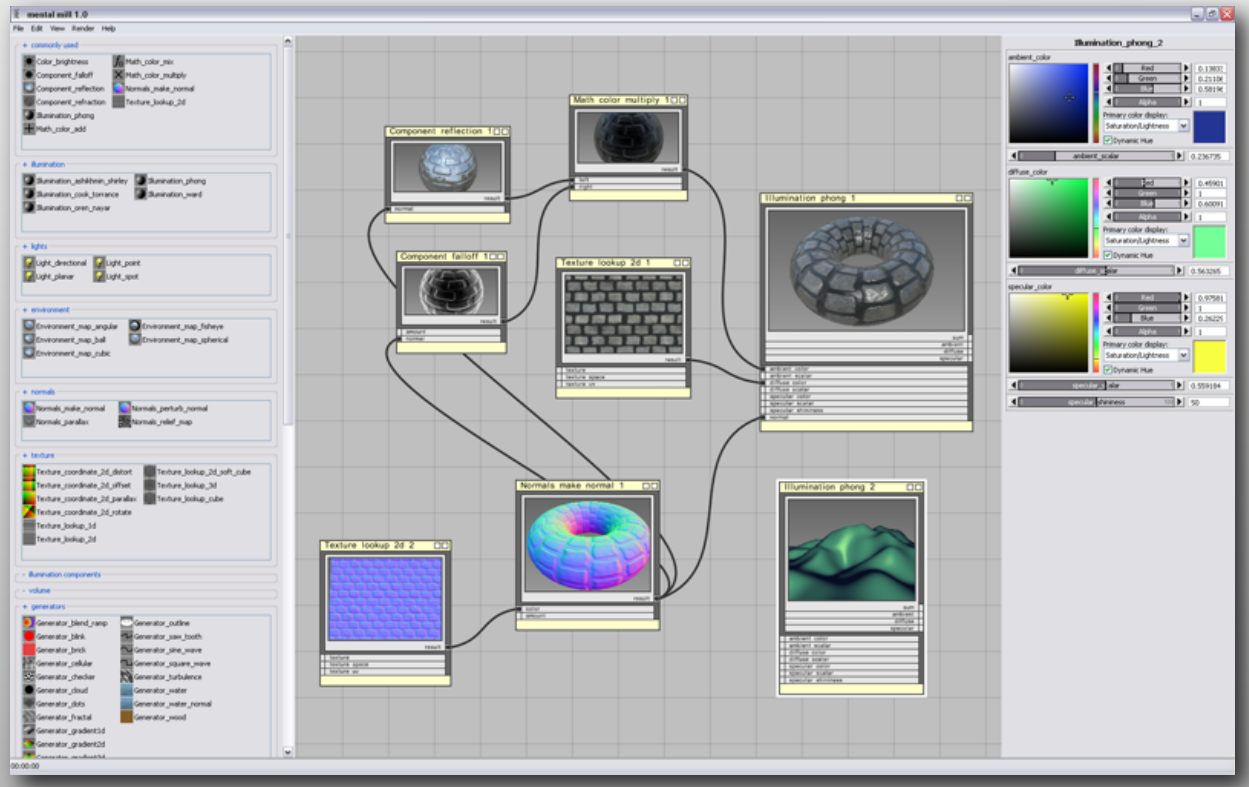


mental mill: integrated visual development environment (IVDE)

Artists and
shader writers can

- develop
- test
- manage

shaders written in
MetaSL™



MetaSL: high-level, platform-independent shading language

Artists and shader writers can develop for

- every platform
- different contexts
- evolving rendering algorithms
- rapidly advancing GPUs

future-proof shader assets

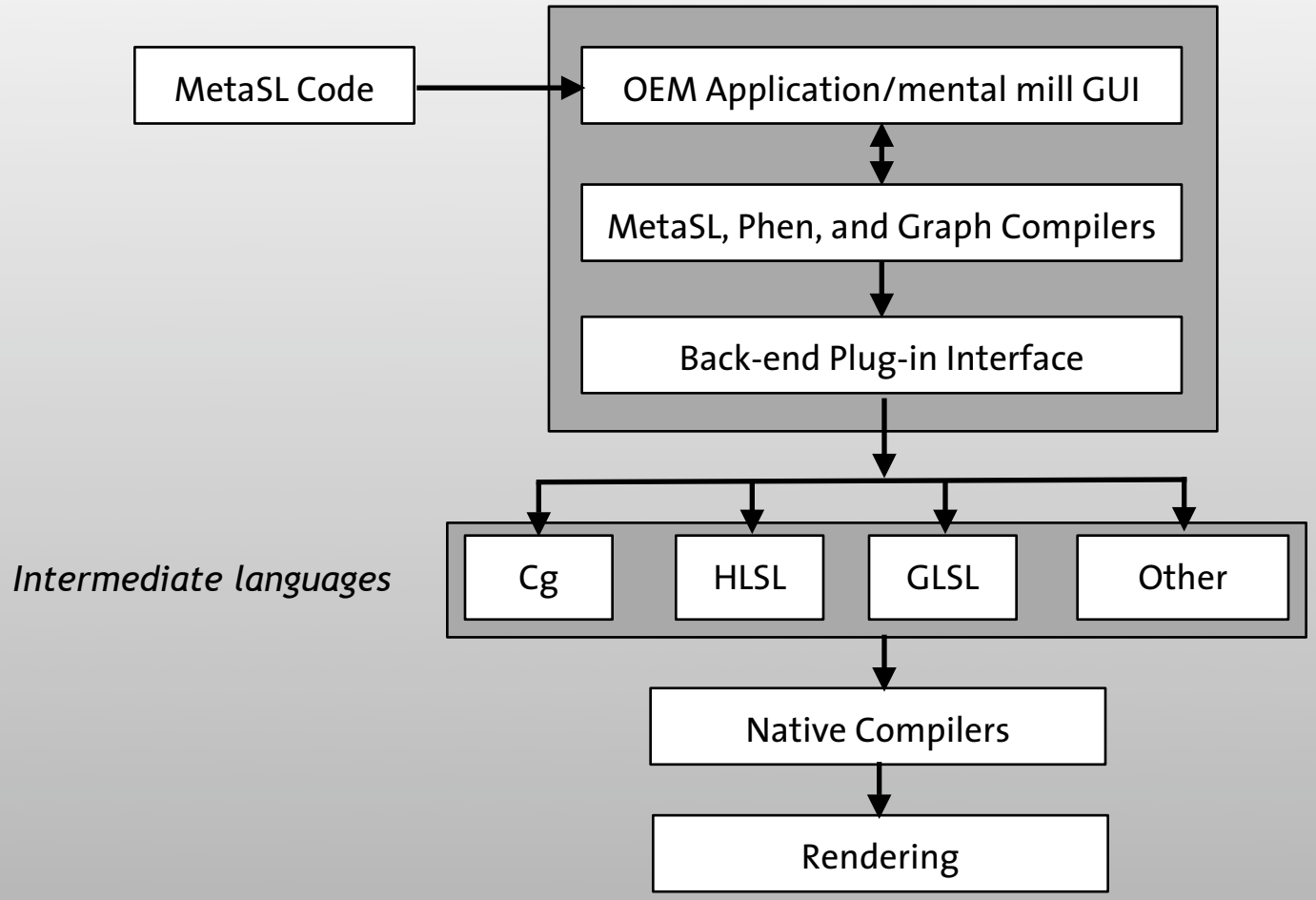
```
47
48      void main()
49      {
50          // Sample the height and center on 0.0 (scaled down too)
51          Scalar h = tex2D(height_tex, texture_coordinate[1].xy).x;
52          h = h*amount - amount*0.5;
53
54          // The view direction in tangent space.
55          Vector3 vtan = tangent_space[0]*direction;
56
57          // perturb the vertex coords. Move the texture torward the eye when
58          // the height is negative and away when positive
59          Vector2 uv = texture_coordinate[1].xy;
60          uv.x -= vtan.x*h;
61          uv.y -= vtan.y*h;
62
63          // get the normal from the normal map
64          Vector3 n = (tex2D(norm_tex, uv).xyz - 0.5) * 2.0;
65
66          // transform the normal out of tangent space and re-normalize
67          normal = normalize(n*tangent_space[0]);
68
69          // diffuse and specular results from lighting
70          Color diffuse  = Color(0,0,0,0);
71          Color specular = Color(0,0,0,0);
72
73          // iterate over scene lights
74          Light_iterator light;
75          foreach (light)
76          {
77              Vector3 vhalf = normalize(light.direction - direction);
78              Vector4 illum = illumination(
79              light.dot_nl, dot(normal, vhalf), specular_shininess);
80              diffuse  += illum.y * light.contribution;
81              specular += illum.z * light.contribution * specular_color;
82          }
83
```

mental mill is more than just another shader graph editor

As GPU's and rendering algorithms become more powerful it becomes increasingly more difficult and more costly to:

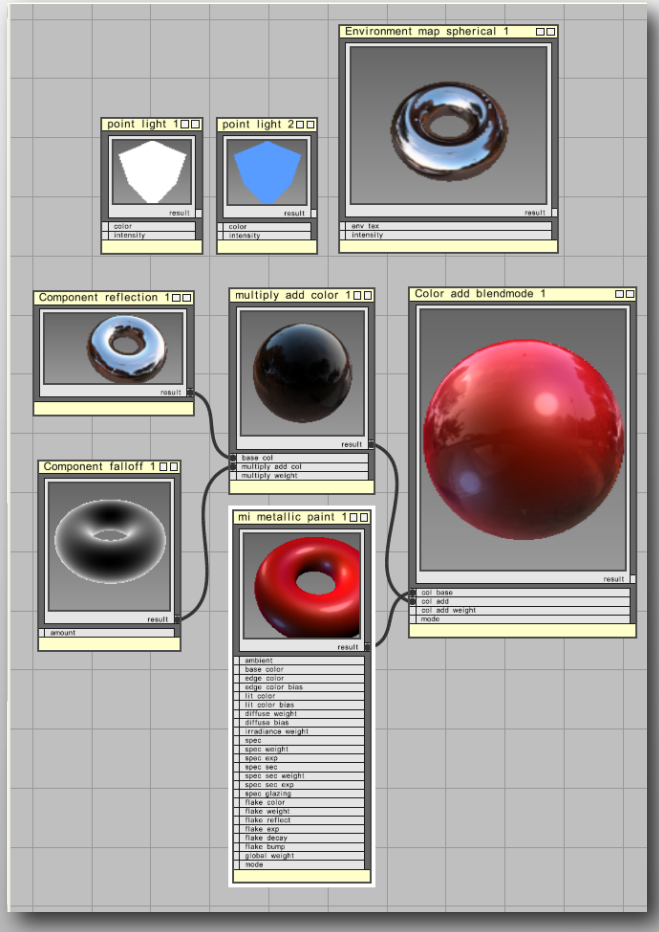
- create and maintain shader assets
- share shader assets between different media/content

Artists can build shader graphs that allow them to experiment and develop the look of their game assets independent of the shader programmers, without being limited by the implementation details.

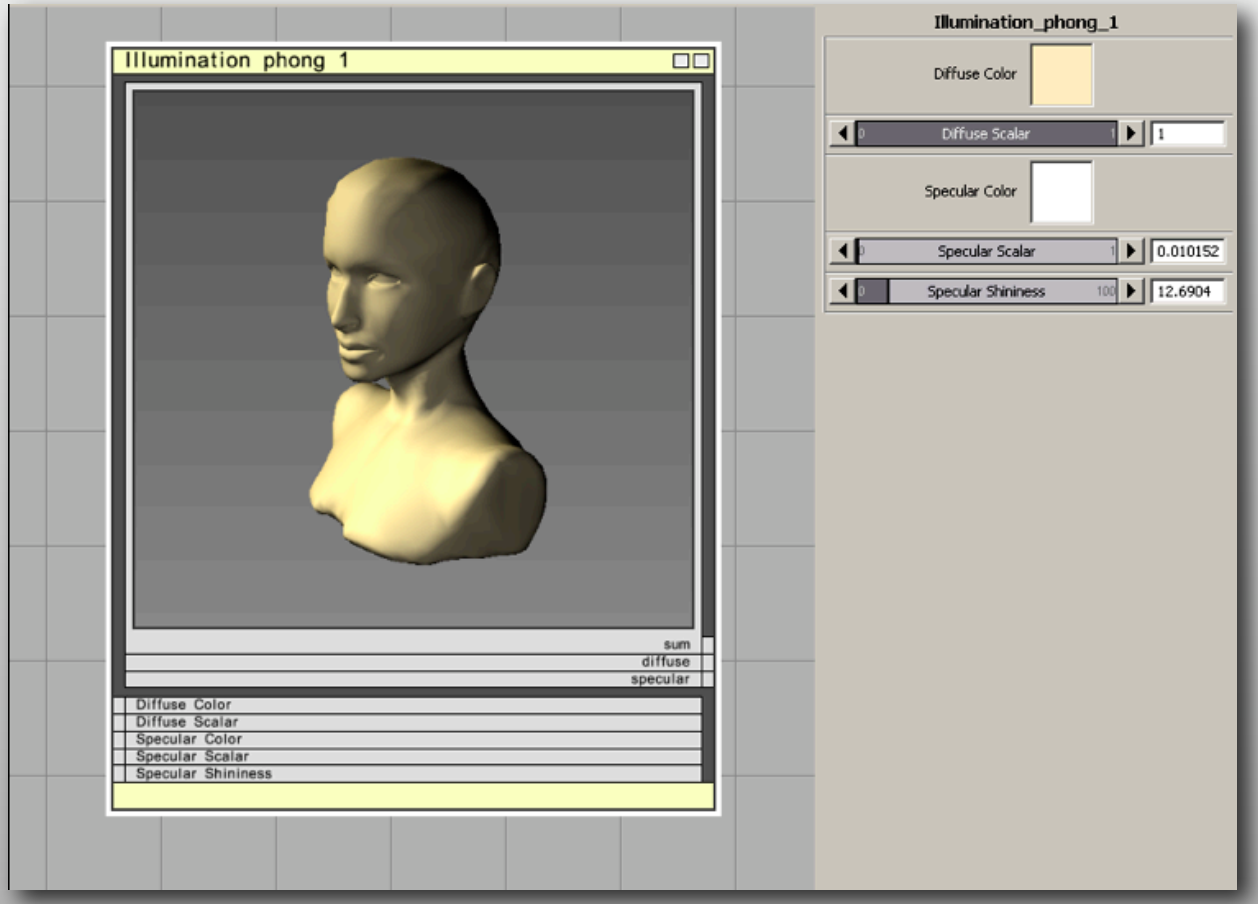


mental mill data flow overview

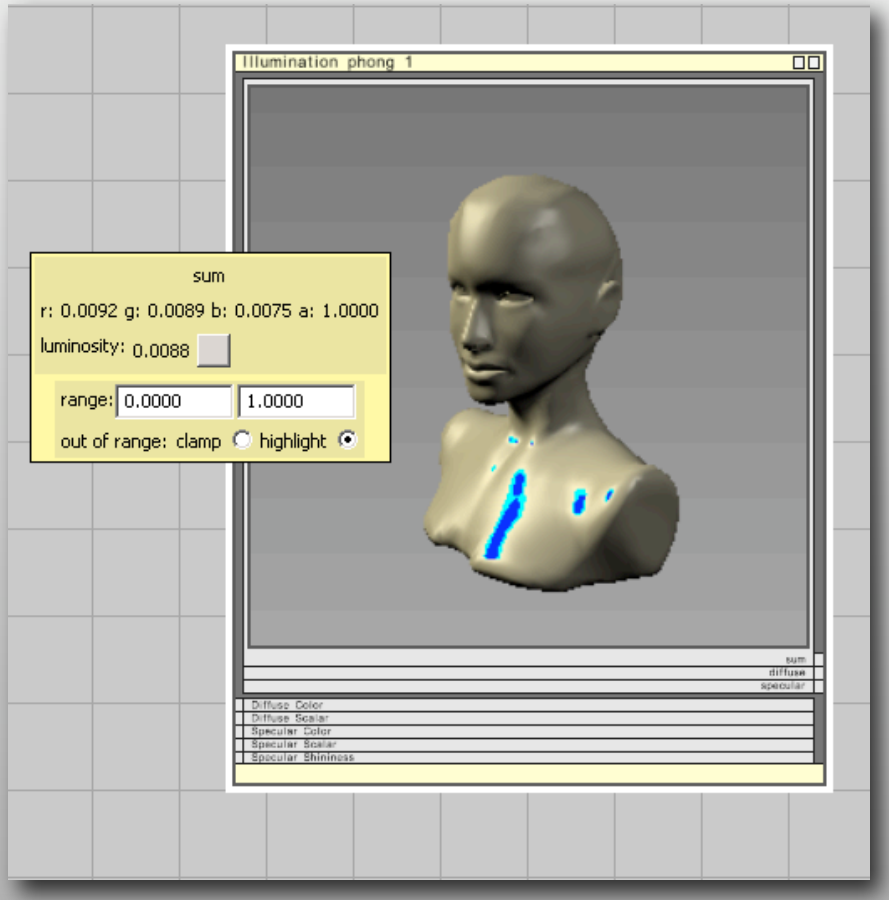
Build shader graphs from the included library of Metanodes™



Phong shader in MetaSL render



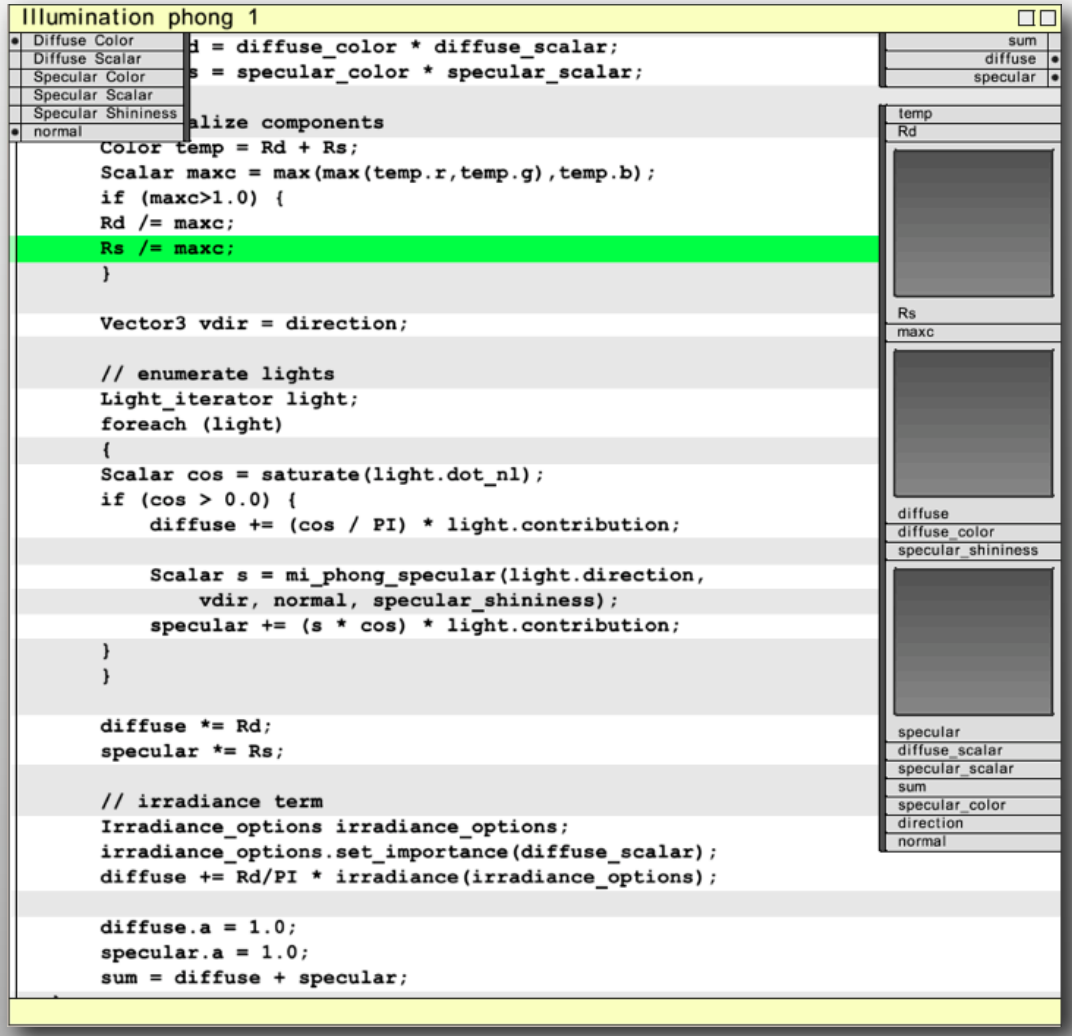
Debugger ‘get info’



Phong shader

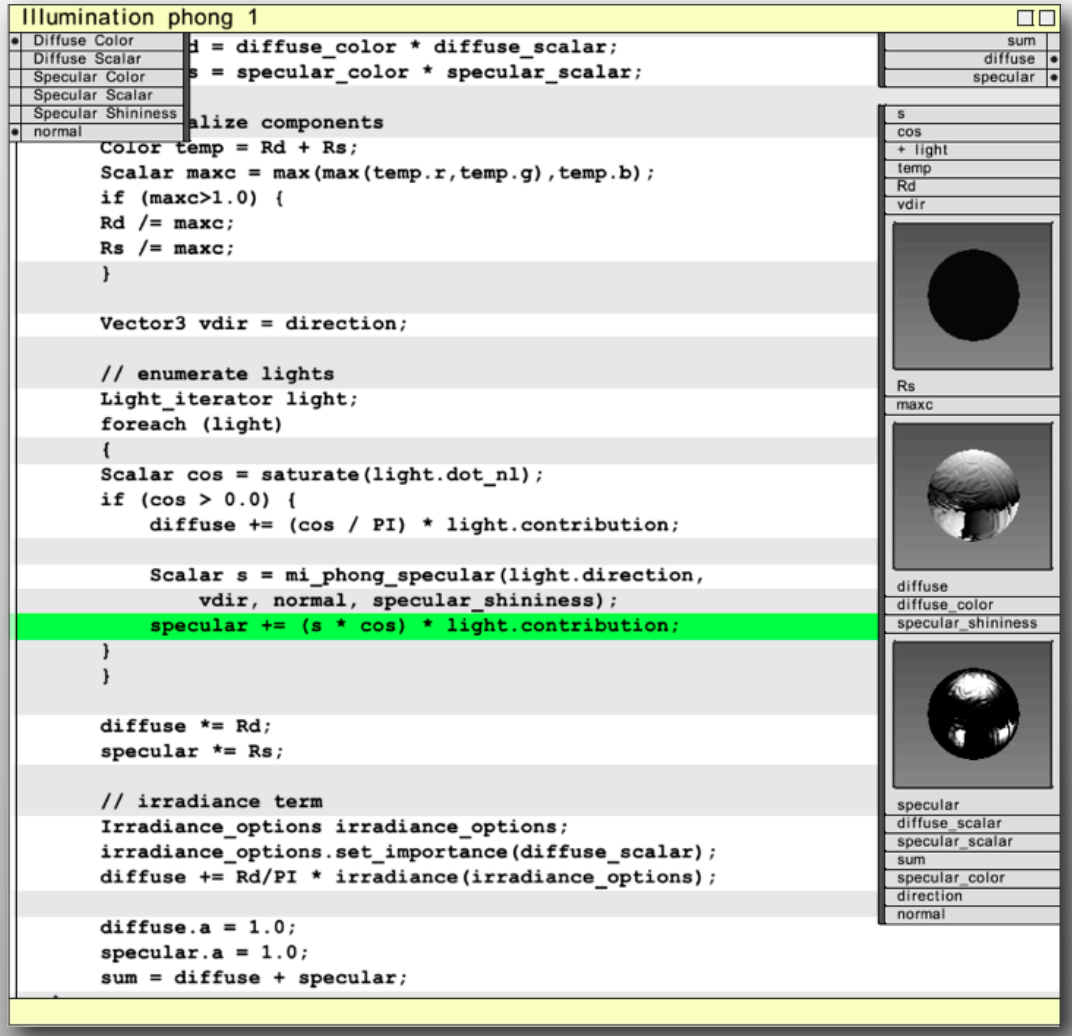
debug mode

evaluate RS



Phong shader

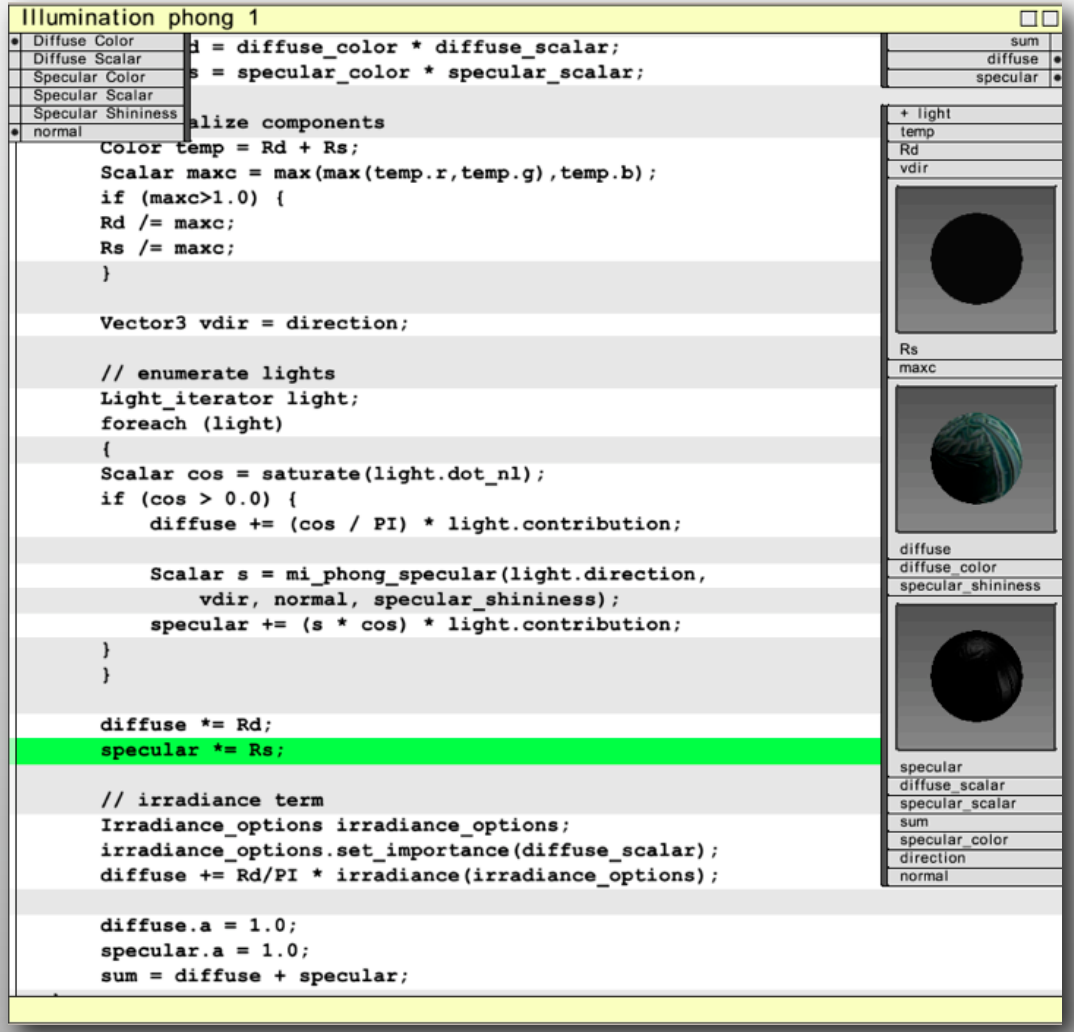
- debug mode
- evaluate specular



Phong shader

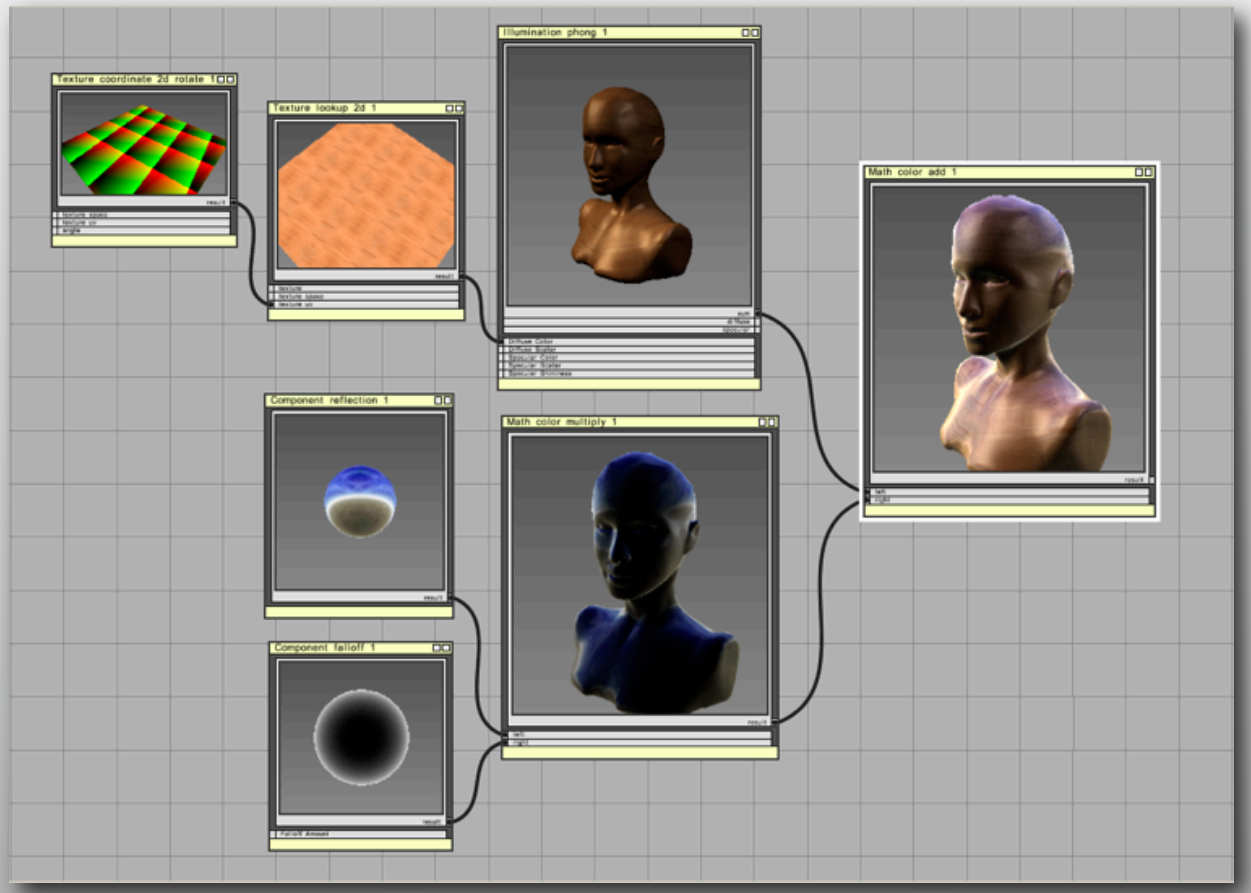
debug mode

specular*RS



NVIDIA

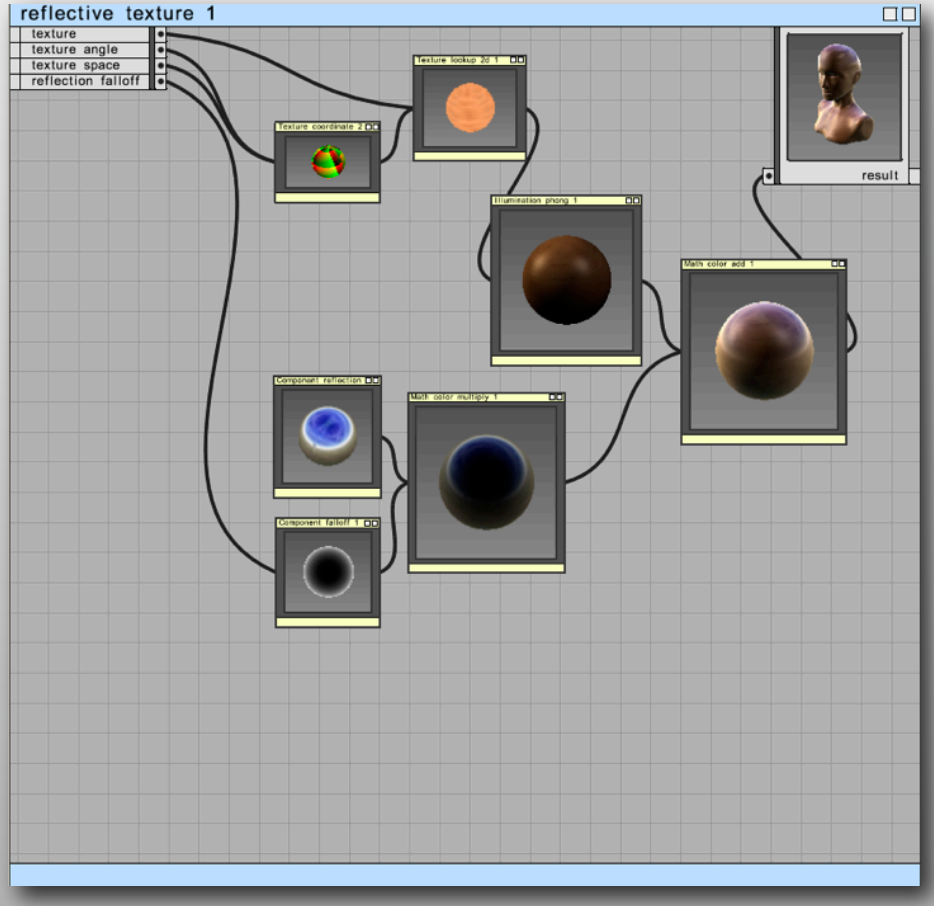
Add a texture and a reflection to the Phong node



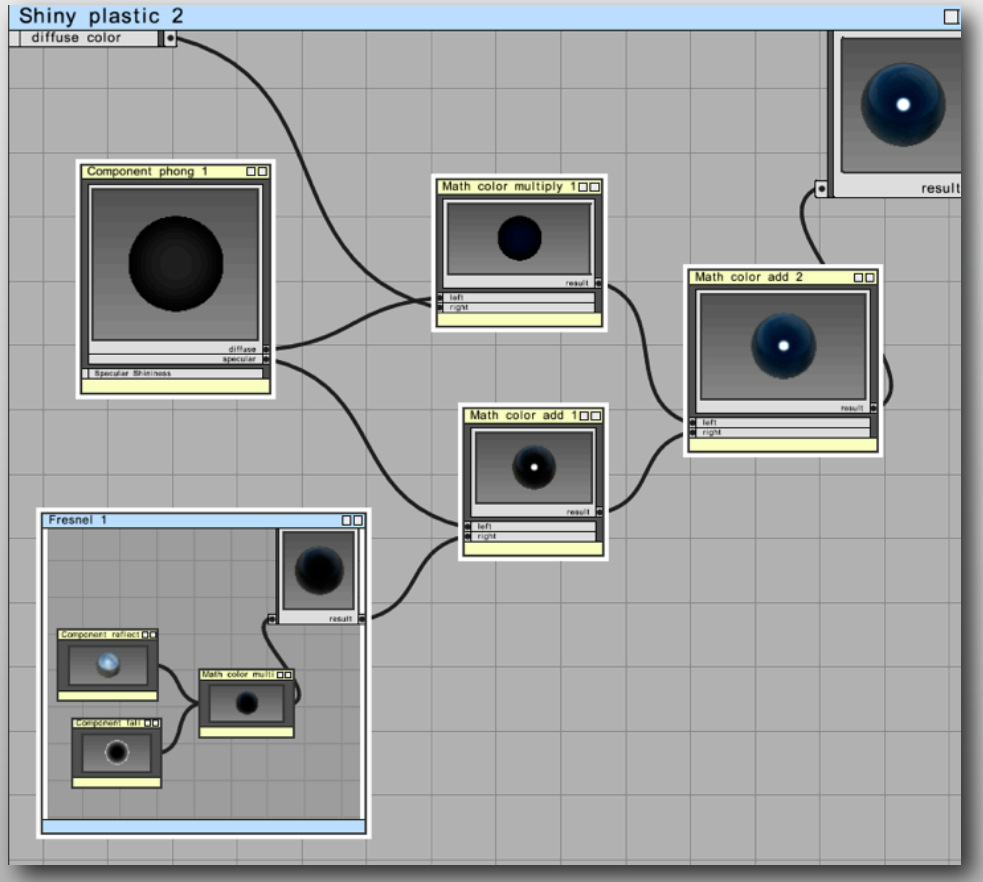
Create a Phenomenon from the Phong shader graph

Encapsulate a shader graph to:

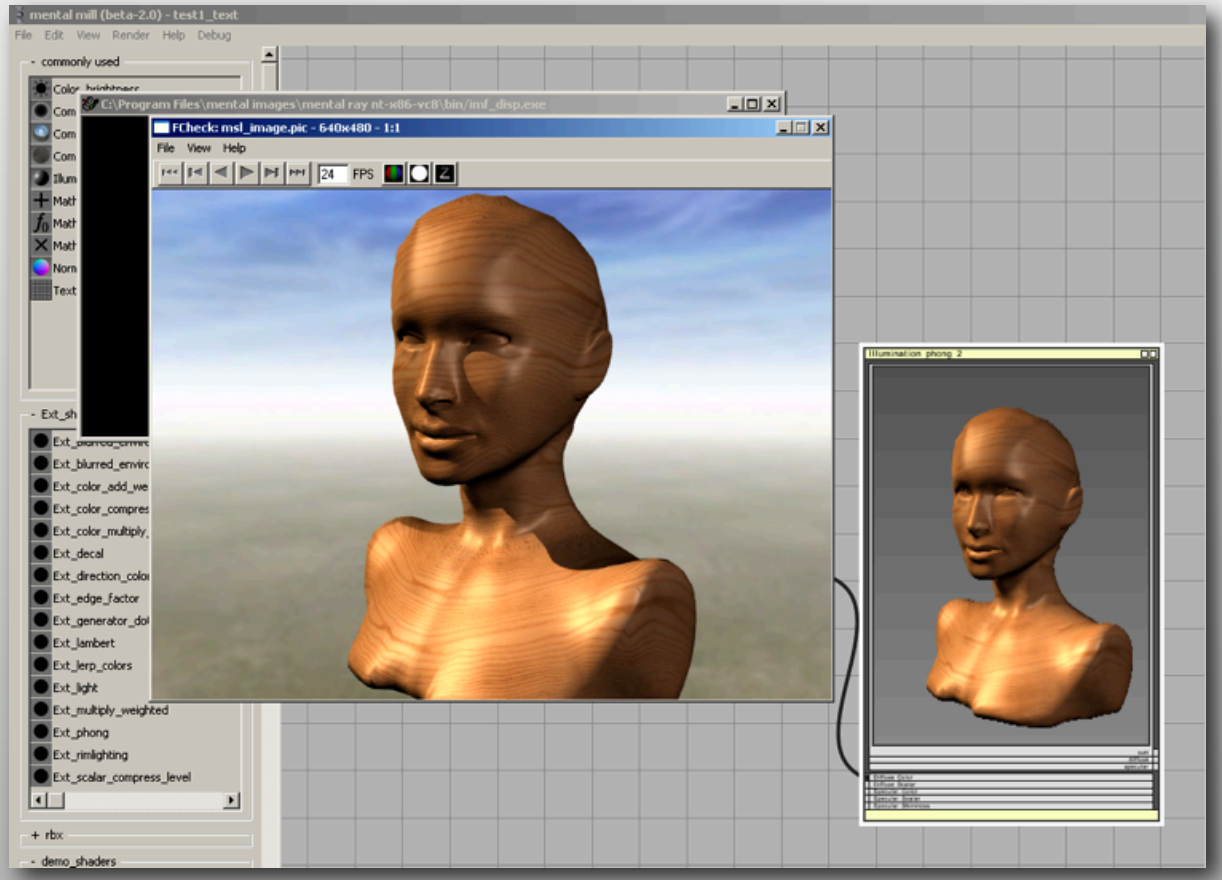
- simplify attributes
- protect a developed look
- reuse in creating shader graphs



Reuse a Phenomenon inside another Phenomenon



mental ray® preview renderer plug-in

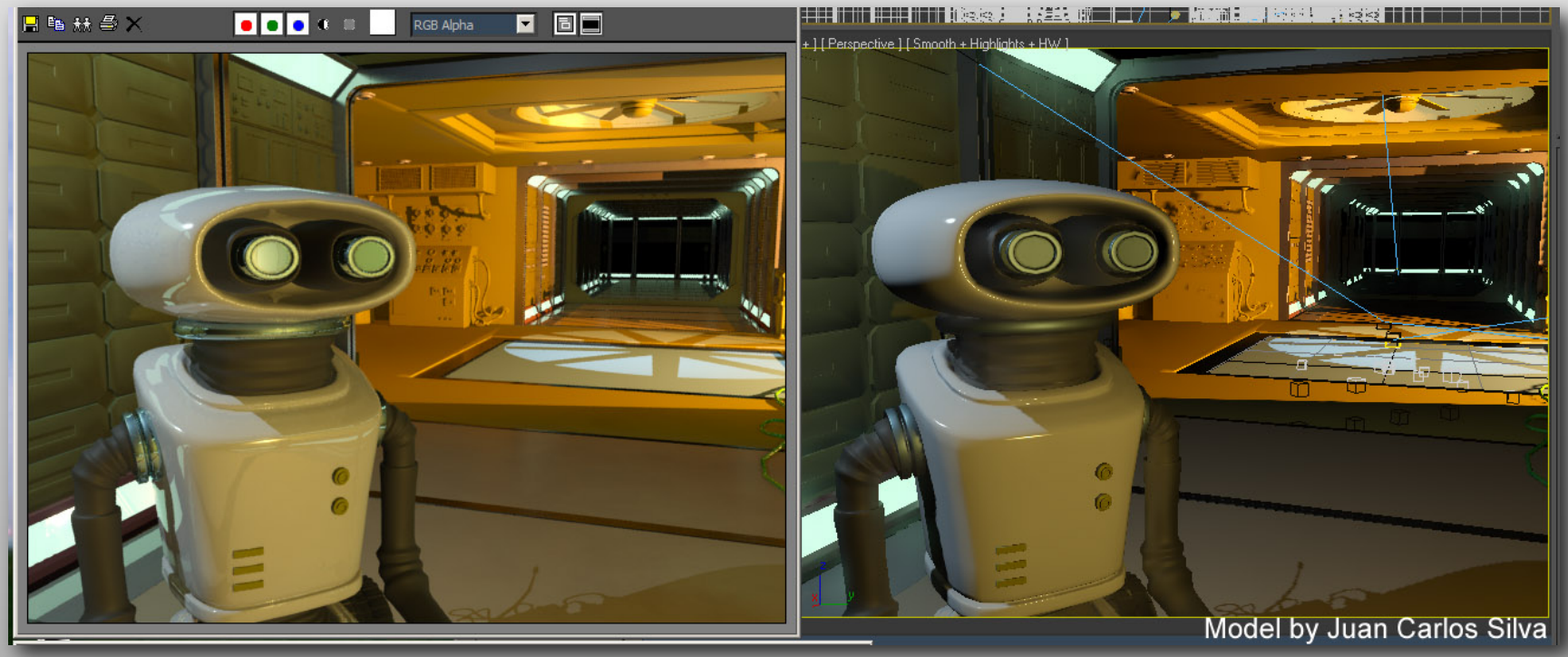


Platform-independent shader development with mental mill®: the making of Dead Rising 2

What version of mental mill do I need?

Artist Edition: bundled with Autodesk 3ds Max®

- Metanode library to build shader graphs and Phenomena
- 3ds Max viewport and mental ray rendering



What version of mental mill do I need?

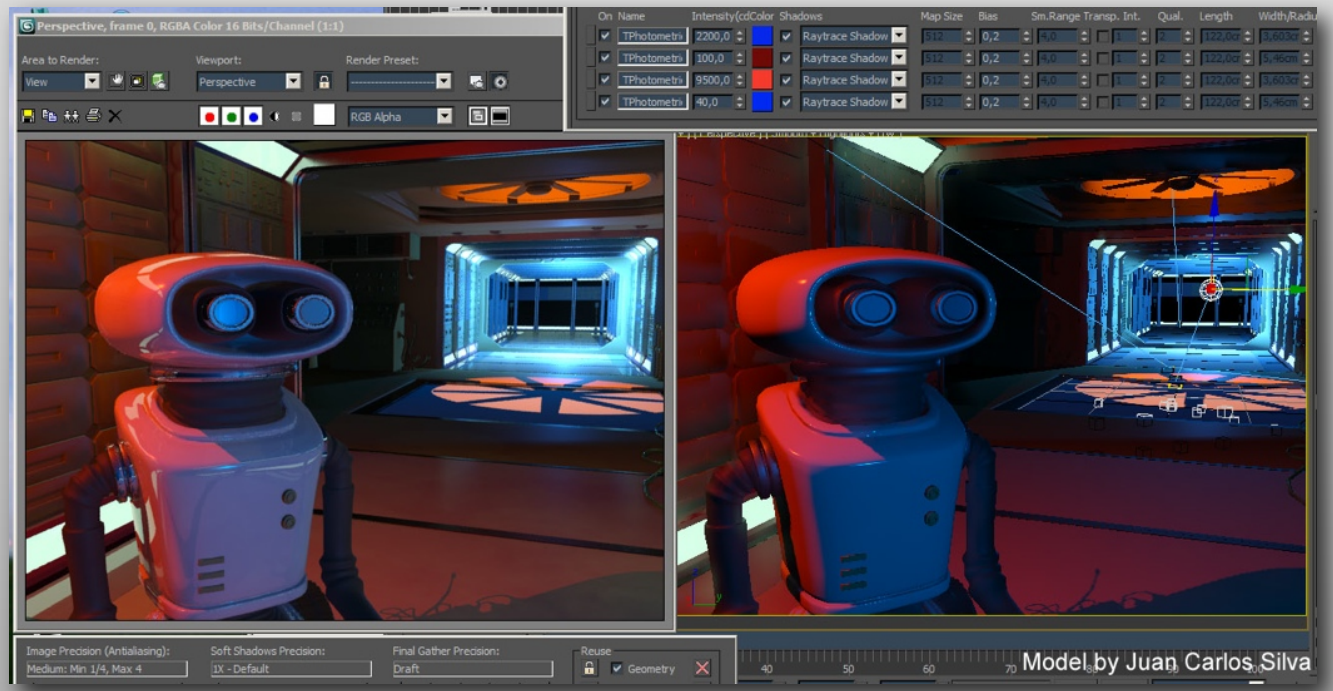
Standard Edition: available from mental images

- Everything in Artist Edition
- Integrated shader editing and visual debugging tools
- Customizable back-end formats for CgFX, HLSL, and GLSL
- Back-end plug-ins for Maya, Softimage, CATIA, and FX Composer
- mental ray preview plug-in

What version of mental mill do I need?

Integrator Edition: available from mental images

- Component mental mill API libraries for integration into:
  - Design and DCC applications
  - shader pipelines



How to learn more about mental mill

Online:

- Website: http://www.mentalimages.com
- Forum: http://forum.mentalimages.com

During GDC:

- Expo Suite 656, West Hall