




Hydra Renderer

Quick Start
v1.7d



Installation

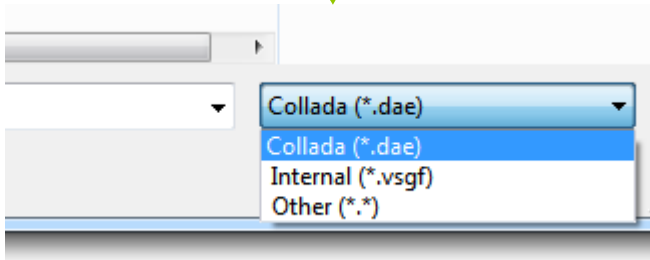
- You will need:
 - CUDA 5.5 or higher
 - Reboot your machine after CUDA installation
 - Otherwise hydra.exe may not find appropriate CUDA DLL
 - But if you run hydra.exe from the command prompt reboot is not needed
 - Any CUDA enabled GPU
 - CUDA Compute Capability 1.1 is recommended
 - Necessary for photon mapping and partially IC
 - ~1Gb video memory is recommended
 - Please visit
 - <https://developer.nvidia.com/cuda-downloads>

Scene export

- ◉ Autodesk Max 2012/2013
- ◉ Use “HydraPlugin.dlr”, it works!
 - ◉ Please see “plugin_manual.pdf”
- ◉ You may also try
 - ◉ FBX COLLADA
 - ◉ OpenCollada (usually works better)

Open scene from file

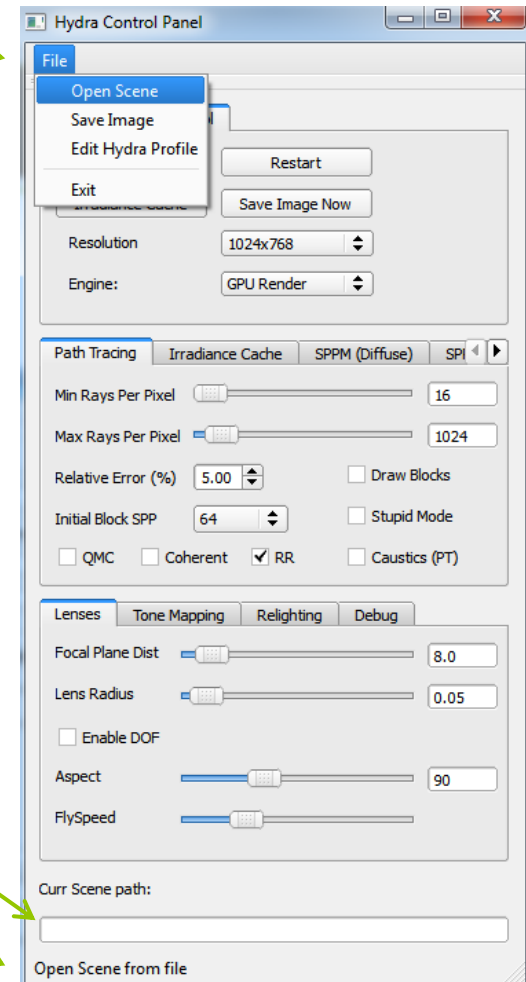
Don't forget to select right file type



Current path displayed here

Prompts displayed here

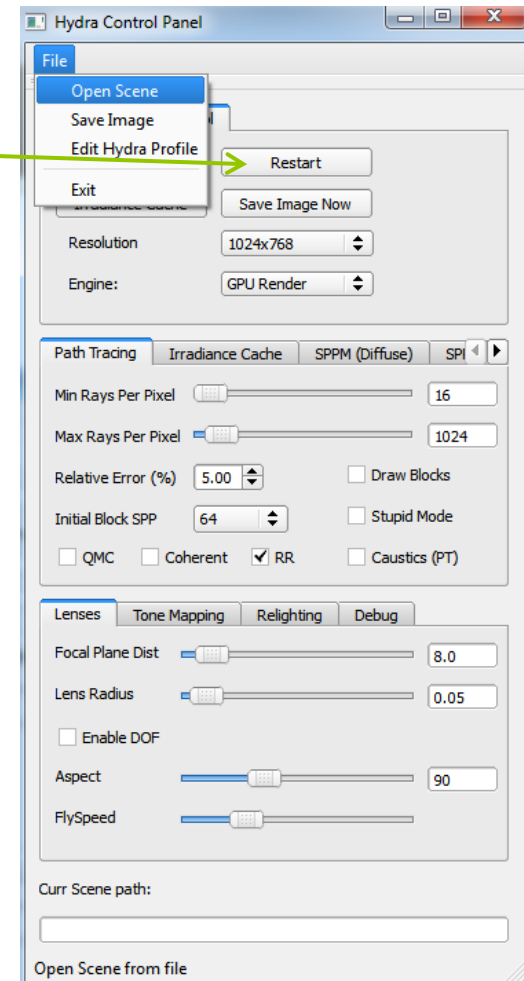
Don't use unicode path!



Starting renderer

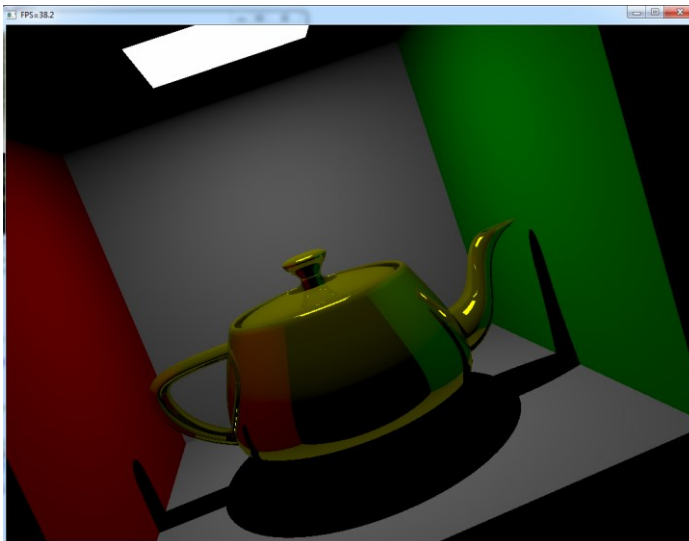
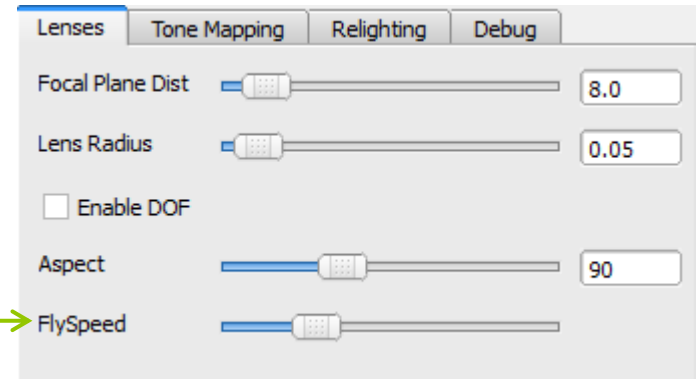
Press “Restart”

If nothing happened run hydra.exe
from the command prompt
after “File->Open Scene”



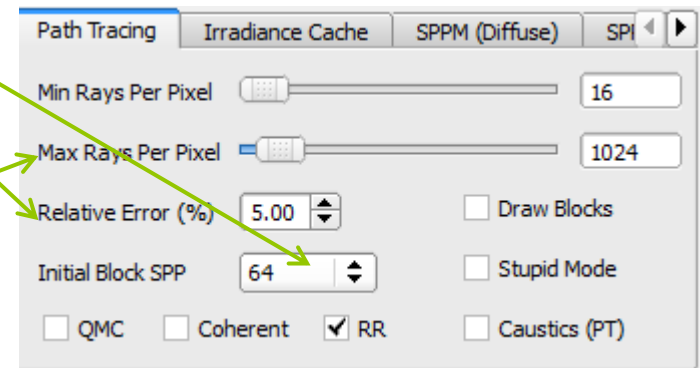
Move over the scene

- W,A,S,D (like in 3D shooters)
- R,F (up and down)
- Q,E (rotate)
- 'Shift' to fly faster
- You may also change fly speed here →



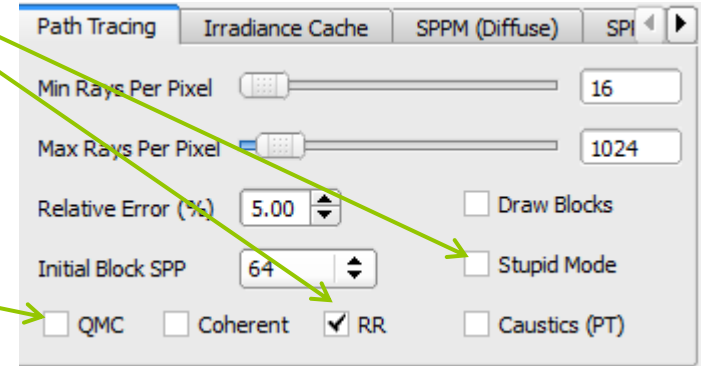
Path Tracing

- Progressive Mode (default)
- Production Mode
 - Path Tracing -> Set “Initial Block SPP” to 64 or higher
- Quality control
 - Set relative Err for HDR image
 - But not more than max samples
- When change Path Tracing settings
 - You’ll see the effect when run Path Tracing again



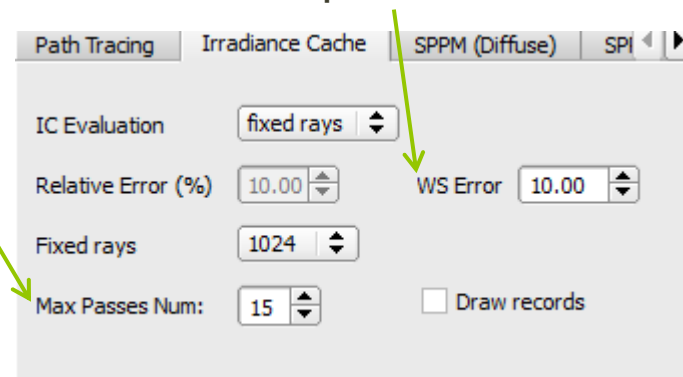
Path Tracing (advanced)

- Stupid Mode
 - Stupid Mode will not use any shadow rays
- Per Warp Russian Roulette (RR)
 - Disable if see small rectangle blocks
 - Good for performance on scenes with strong indirect lighting
- Quasi Monte Carlo (QMC)
 - It is actually “Coherent QMC”
 - Run faster but gives banding
 - Use it if you need extra quality and very high maximum number of samples are selected



Irradiance Caching

- Use it manually by pressing “Irradiance Cache”
- Then press “Path Tracing” to render final image
- Please reduce manually maximum rays per pixel for Path Tracing if it hangs too long when IC computed
- Reduce passes number or increase World Space Error if there too many records



SPPM (Caustics)

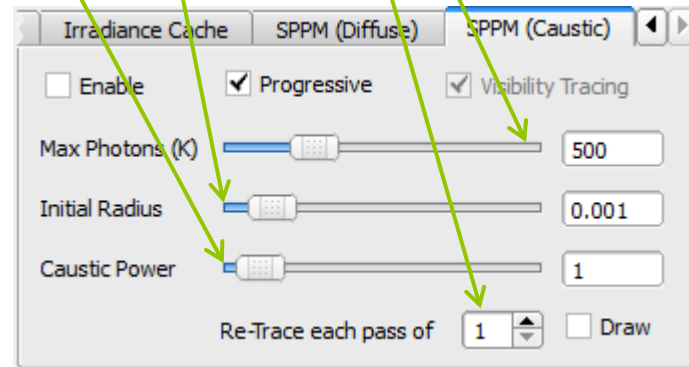
- Stochastic Progressive Photon Maps (SPPM)
 - Should be used with Progressive Path Tracing mode
 - Only single light is supported correctly for now
 - You may disable other lights with like this:

```
<general>  
  <type> spot </type>|  
  <disable_for_photonmap> 1 </disable_for_photonmap>  
</general>
```

- Run SPPM for caustics:
 - SPPM (caustics) -> Check “Enable” checkbox
 - Please increase manually minimum rays per pixel for Path Tracing up to 128 – 256
 - Press “Path Tracing”

SPPM (Caustics)

- Balance between amount of photons and gather rays
- Balance between noise and bias
- Controls caustic brightness



SPPM (Diffuse)

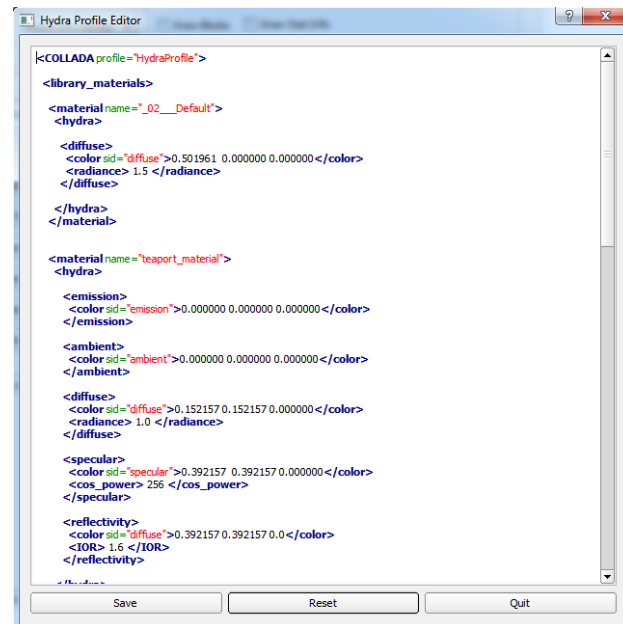
- Don't use it
 - It is made for testing photon maps in general
 - But of course you can try it
- Run SPPM for the whole lighting:
 - SPPM (diffuse) -> Check "Enable" checkbox
 - SPPM (diffuse) -> Check "Progressive" checkbox
 - Please increase manually minimum rays per pixel for Path Tracing up to 256-512
 - Set both store and gather bounces to 0
 - Press "Path Tracing"

Final Gathering

- To Enable Final Gathering:
 - Check SPPM(Diffuse) -> Enable
 - Don't check SPPM(Diffuse) -> Progressive
- Press SPPM(Diffuse) -> Single Pass
 - After that you may change "Gather Bounce" to 0 to see what happened
 - It is recommended to manually tweak gather radius to balance between coverage and performance
 - Change "Gather Bounce" back to 1
- Run Path Tracing or Irradiance Cache
 - Final Gathering enabled when "Gather Bounce" equal to 1

Hydra materials and lights

- File->Edit Hydra Profile
- Documentation located here
 - <http://ray-tracing.ru/articles235.html> (rus)





Hydra materials and lights

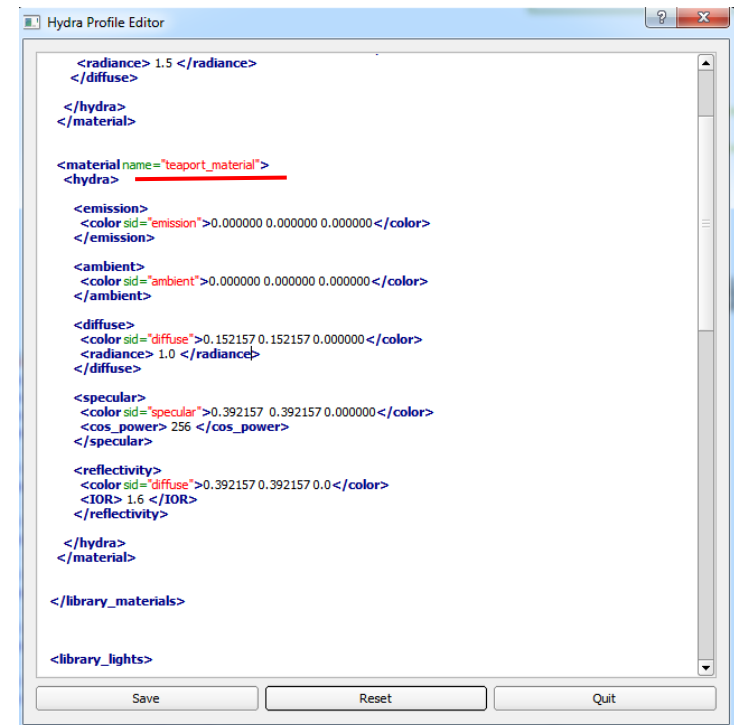
- The 'Hydra profile' mechanism was created to replace any 'standard' materials and lights with the internal Hydra materials and lights
- But you also can add new lights to the scene in the same way
- To replace material or light you need to specify appropriate **same** material/light name
- When adding light you may specify any light name

Hydra materials and lights

- Example of replacing:
Collada file:

```
<effect id="teaport_material-fx" name="teaport_material">
  <profile_COMMON>
    <technique sid="standard">
      <phong>
        <emission>
          <color sid="emission">0.000000 0.000000 0.000000 1.000000</color>
        </emission>
        <ambient>
          <color sid="ambient">0.000000 0.000000 0.000000 1.000000</color>
        </ambient>
        <diffuse>
          <color sid="diffuse">0.392157 0.392157 0.000000 1.000000</color>
        </diffuse>
        <specular>
          <color sid="specular">0.392157 0.392157 0.000000 1.000000</color>
        </specular>
        <shininess>
          <float sid="shininess">256.000338</float>
        </shininess>
        <transparency>
          <float sid="transparency">0.000000</float>
        </transparency>
      </phong>
    </technique>
  </profile_COMMON>
</effect>
```

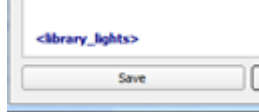
hydra profile:



Hydra materials and lights

- You don't have to seek for material names in Collada files or 3ds max;
- After first load:
 - **hydra_profile_generated.xml** have all names and current parameters
 - You may use this file as initial template
 - it located in the scene folder

Hydra materials and lights

- When you press “Save button”
- All material and lights parameters will be reloaded immediately!
- You don't have to press “restart” unless you changed textures, or add new lights.
- Also you have to press “restart” if you changed position of spherical, area or mesh light (because BVH have to be reconstructed)
- **hydra_profile_generated.xml** have all names and current parameters