

Emission Profile Master

{Code 66}

Welcome to this guide that will help you understand and maximize your experience using the EPM (Emission Profile Master).

The Iray render engine has support for what is known as Emission Profiles, .IES-files. They IES standard has been around since the late 40s and defines how you calculate how light is distributed from a light source, and have been used within architecture designs and planning ever since.

The IES standard is rather complex, and Iray only implements a subset of the whole standard, but enough to be really useful if you can harness its power.

The difference between just adding an Emissive setting to a mesh and using IES profiles depends on many things, but the most important thing is the mesh. Iray and the IES handling is rather picky about how the polygons are formed in the mesh that will be used for emission.

There are very few meshes that really work “out of the box”, but EPM has a solution for that, which you will learn if you read through this guide.

The old way

First, we will add lights to a car head lights the old way. For this purpose I will use the 1930 Army Truck, one of my favourite vehicles, a Platinum Club item.



The front of the Army Truck.

The old way is to just set the head light glass to emissive surface and you get lights.



This is how the lighting will look just using emissive surface without any IES-profile at all. Now, we add an IES-profile to the surface.

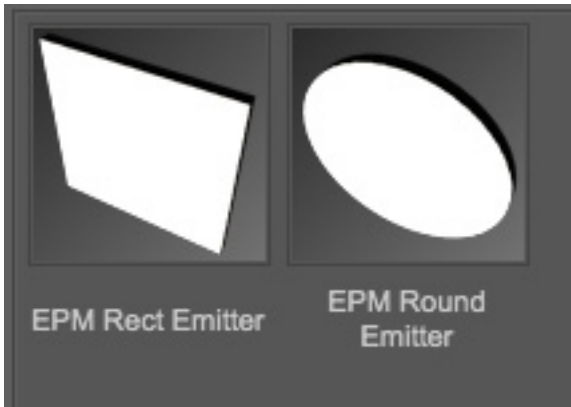


Oops, that didn't turn out so well, or what do you think? The reason is as mentioned before, Iray is picky about how the mesh and the polygons are setup, how they are facing in the mesh and how they originally was rotated in X-Y-Z, nothing that ever has been an issue before, and nothing most people ever will care about. But, as I said, EPM is here to help you.

Now I know you are curious.

The help is near

EPM comes with two small helper props, the emitters. One round and one rectangular, the latter has a morph to adjust the size of one of the sides to make it fit for example in different lamp posts.



You will find those props in Props/Emission Profile Master using the Content Directory or through the Smart Content.

First we reset the head light glass to its original material settings, then we add two round EPM Round Emitters to the scene, and place them behind the head light glass. The light will be emitting from the white light side of the props. You use the normal General controls in DAZ Studio to size the props to fit, and to place them and rotate them. We rotate the right one a little to the right (the way head lights are adjusted so you can see pedestrians and animals better), and we also let both point down about 18 degrees, a little more for the right one, but that is your artistic freedom.



This is how I placed the EPM Round Emitters inside the head lights. Now let's see how it looks. Just remember that the EPM Emitters doesn't come with an installed IES-profile, so they will by default act just as a normal light emitting surface.

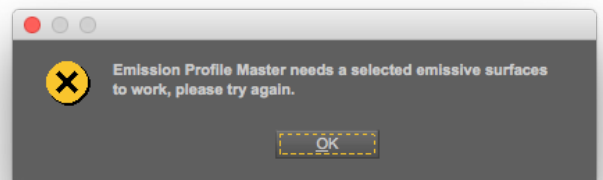


As you see, it looks quite similar to using the head light glasses as emitters, but that is about to change. Now I add an IES profile to the headlights, and the result looks much better.

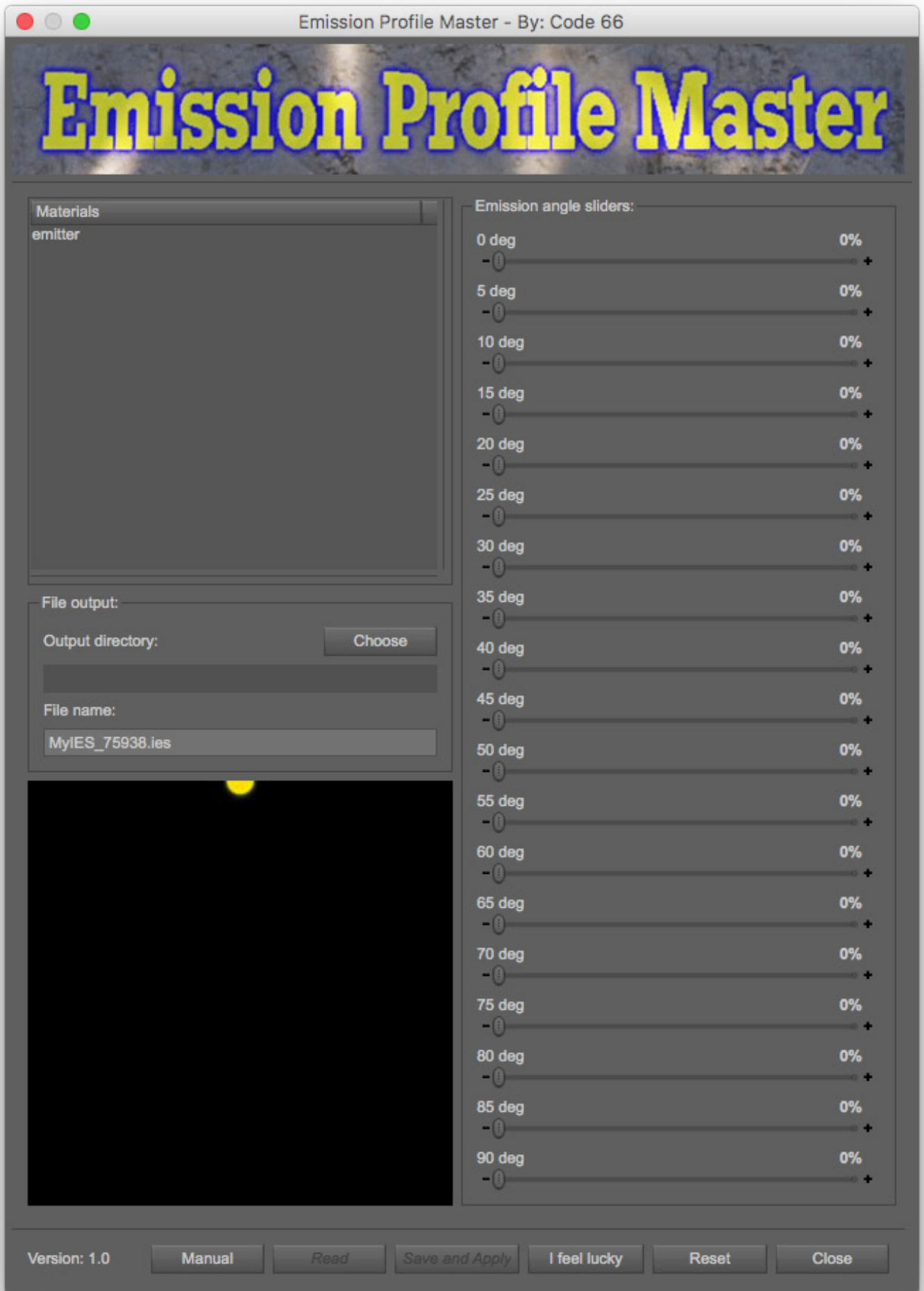


Are you really curious now how that was achieved? The heart of everything is the IES-profiles, which you now can create and modify within DAZ Studio and instantly see your result in the Iray preview render.

When the Emission Profile Master script is launched, you need to have at least one item selected in the scene that has at least one emissive surface, or it will sadly chicken out with an error message like this:



The Emission Profile Master GUI



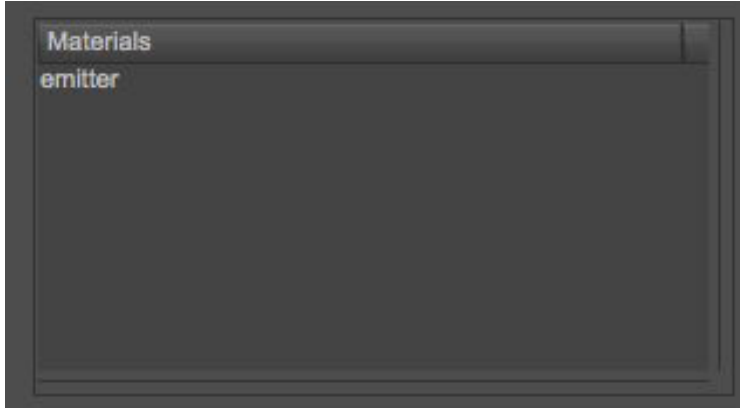
Disclaimer:

The GUI you see might look a tiny bit different as things might have been adjusted, to the better, in the final version.

The GUI breakdown

First is the materials list, where all Emissive surfaces in the selection is listed. If you select multiple objects in the scene, they will all be visible here.

You can select several surfaces in the list, so you can apply the same IES-profile to several surfaces with just one click.

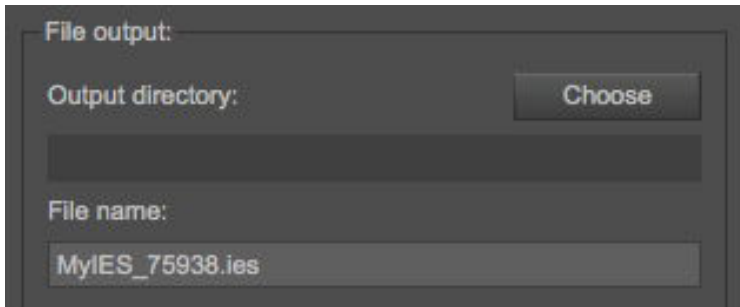


When you want to read the IES-profile used for a surface, you will have to select only one, or the read button will not be active. In this case there is one material, emissive surface, called emitter, which is the name of the surface of the EPM Round and Rect Emitters.

Next up is the output setup box, where you setup where the generated IES-file are to be saved.

Output directory is the directory where you want the IES-profile files to be saved.

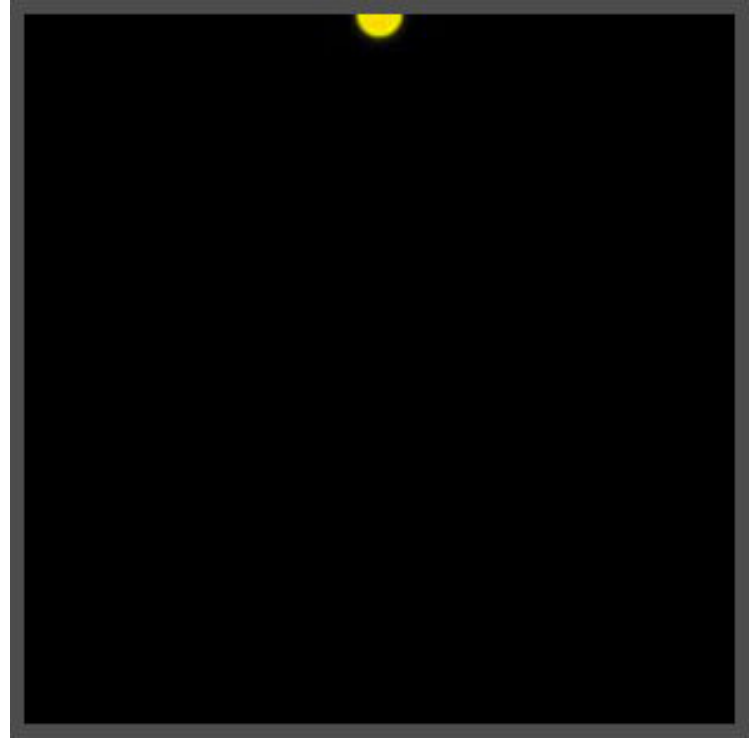
File name: is the actual name of the file. Emission Profile Master generates a random filename beginning with My-IES_ and the a random number between 1 and 99999, to help you keep your filenames unique. You can edit the filename in the GUI.



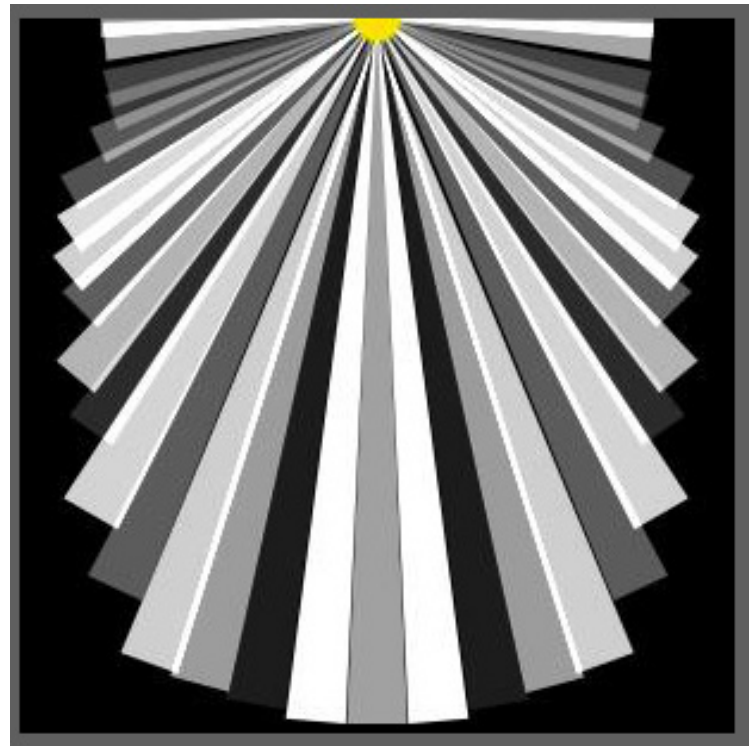
Tip:

This is something you need to remember, the IES-file is an accompanying file, much like texture maps, and if you move your scene or your setup prop to another computer, the reference to the IES-file will break unless you remember to move that one too.

Now the heart of the visual feedback, the IES-profile view. This is where Emission Profile Master visualize how the emission profile looks. The first image show an empty profile, all values are set to zero.



The second image shows how a setup IES-profile looks in the visualizer.



The brighter the ray is, the more light will go in that direction. The visualization is far from super accurate, but it gives a hint on how the result will look. Use it as a guide, then test the actual look in the Iray preview renderer.

Now the sliders, which controls the rays, the amount of light going in each direction. I only show you the first few so you get the idea. The 0 deg (degrees) is the one pointing straight down, and those are more powerful as that's the way most light goes from a light. The almost horizontal ones are the 90 deg, and those are the weakest ones. With the sliders you adjust how much you want to depress the original light (which is calculated using the flux & light formula from the late 40s).



You have live feedback so when you adjust a slider the visualizer feedback is automatically updated.

The buttons, the first three on the right.



I feel lucky - Generates a random IES profile as a starting point to build from.

Reset - Resets the Emission angle sliders to zero.

Close - Closes the script, simple as that.



Manual - Shows manual so you probably found it already.

Read - (dimmed) This will load the IES-profile currently installed in the emitter surface.

EPM will only load IES-profiles that were created using EPM, because there are so many different things you can have in a file, like any amount of angles, and loading an IES-profile into the GUI where the angles doesn't match would just not work. It is also because IES-profiles are copyrighted, so reading someone else's IES-profile, adjust it and save it as your own isn't legal.

The output directory and the filename will be set to what was read from the material.

The **Read** button is only active when there is exactly one material selected in the list.

Save and Apply - (dimmed) This will save the IES-profile file to the disk and then apply it to the materials selected in the list.

This **Save and Apply** is only active when there is at least one material selected in the list.

Some practical work

It's time to do some practical work now, to get down and dirty hands on with IES-profiles and emitter prop usage.

The basic workflow, that was developed during the development of this script, is very similar to the first demonstration given in this guide.

If you think the mesh itself will work as an emitter with an IES profile, or you have verified it before, give it a shot, otherwise, use one of the EPM Emitter props and place it at good location and parent it to the object. Without parenting, you will lose the location if the object is moved, and moving around objects in the 3D scene is what we do, isn't it?

When you have decided what is going to emit the light, then it's time to configure the light itself. You do that manually or use any of the different light products available for Iray in the store. Real Lights is a good starting point, if you do not have the knowledge or time to come up with a good light setting. The EPM Emitter props comes with a basic light setting, but it can be too weak or too strong depending on the scene and other light sources.

One thing to remember is to set the Iray Render Settings -> Environment to either **Dome and Scene** or **Scene Only**, otherwise your emissive light will not be active in the renderer.

Tip:

Right click on the Emission Profile Master script file in the Content Browser and select Create Custom Action to get it installed under the scripts menu. This makes it easier to quickly run the script when you want to adjust or create IES-profiles. If you have the Iray Preview rendering in the Viewport, you can adjust the IES-profile, **Save & Apply**, and you will see the result in the Preview as the render restarts.

Select one or more objects in the scene with emissive surfaces before you start the script, the surfaces will show up in the Materials list.

If the Material has an IES profile created with Emission Profile Master, you can click the Read button to load the current settings into the script, for editing.

When editing, there are a few things to remember, but the basic is that the lights always has most of the light directed forwards, and less emitting to the sides. Adjusting the parameters will allow you to get the shape of the emission to look more realistic than “digital light”, which has the same light effect emitted from the whole surface, resulting in a nonrealistic light flow.

One of the less obvious uses of IES-profiles is to use them to light character portraits, casting a natural light upon the characters faces.

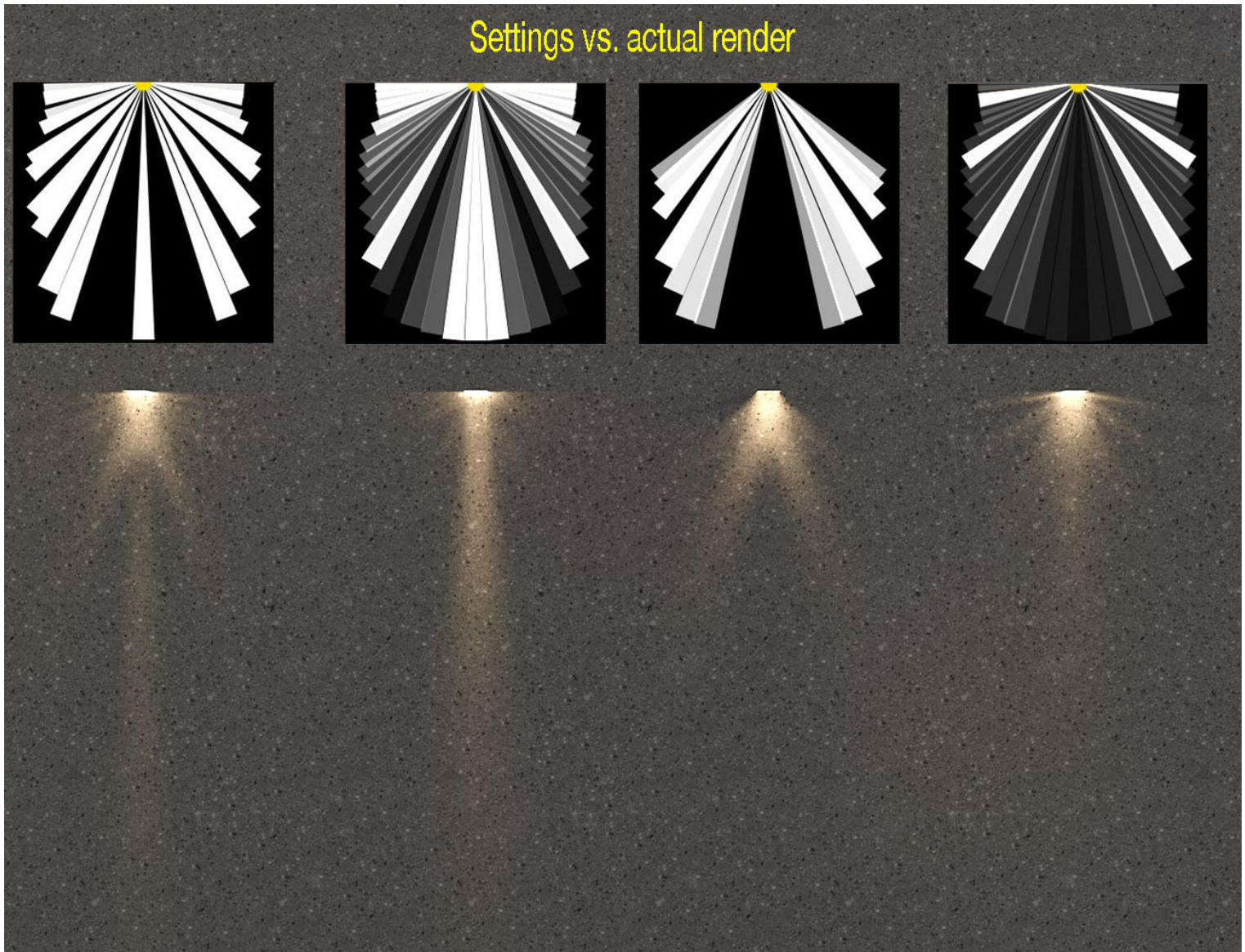
This works like the direct opposite of photo studio lights, which are designed to give a smooth constant light by the use of reflectors. Using IES-profiles for characters lighting will make them look like they are not in a photo studio but out in the real world.

Known limitations of the IES-profiles

These are things that you will experience. This list is here so you know that it's not you doing it wrong. Some of the limitations are in the IES definition itself, others are in the Iray implementation of IES profiles.

- Square emitters will still cast round IES light profiles. The definition of IES is based on angular data providing the amount of light coming in a certain direction. it doesn't matter if the emitter is round or square or in any other shape, the emission will still come in a round shape.

- If you dare scrutinize the IES profile standard document you might find many things and ask yourself why can't I do that? The simple answer is, it's either not implemented in Iray, or that I decided to simplify that functionality to make the script usable.



A quick guide showing settings and results