DV20484

Render Like a Photographer

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Learning Objectives

- Learn how to differentiate good renderings and photographs from the bad ones

- Discover the 3 principles of photography

- Discover the 4 rules of photography composition

- Discover at least 4 photographic phenomena and how they affect images

Description

Back by popular demand—this class will guide you through the essentials of creating a stunning image. Nowadays it's not enough to just know how to create a rendering; to sell your image it's important to know the vital rules and principles of photography. This timeless class will break down the principles of well-known architectural photographs and renderings and translate them to creating renderings using 3ds Max software. This class will also highlight photographic elements and demonstrate how to apply them to 3D renderings. So whether you want to create better renderings or learn more about photography, this class is for you

Your AU Experts

Ramy Hanna is the co-founder of Tiltpixel, a full service creative studio and a leader in architectural visualization. He has been in the arch-viz industry for the last decade creating architectural renderings and animations. He is familiar with various 3D software and a variety of rendering engines. He also dabbles in architectural photography and has had the privilege to win several design awards including AIA Design Awards. He has also spoken at several speaking engagements such as Autodesk University, RTC, and VisDay. Ramy is an online instructor for The Gnomon Workshop and Blackspectacles.com. Since 2009, he has been on the 3dsmax beta team providing input into the design of 3ds Max software. In 2003, he was involved in an animated short nominated at SIGGRAPH, and in 2006 his animated short played in AMC movie theatres nationwide.

What Makes A Good Rendering?

Often when you look at a good rendering you don't say "this is a good rendering because..". Rather the image just grabs you. There are so many things that make a rendering a "good" one. Much of it is really based on photography. So to create good renderings, you have to learn from good work as well. If your references are bad, then you will create bad renderings. However if you learn from the best, then you can pick up the good things that those before you have done. This is my short list of talents who have inspired our industry, and set precedence in the photography and arch/viz community:

- Julius Shulman
- Ezra Stoller
- Alex Roman
- Juan Altieri
- Peter Guthrie

If you really want to hone your skills, I would suggest looking up these talents and seeing their work. Don't just look at them, but really spend time to dissect and analyze them; doing this will take you further than you know.

Principals of Photography

There are 3 principals of photography. If you can apply the rules of these principals to your renderings, you are well on your way to creating good renderings.
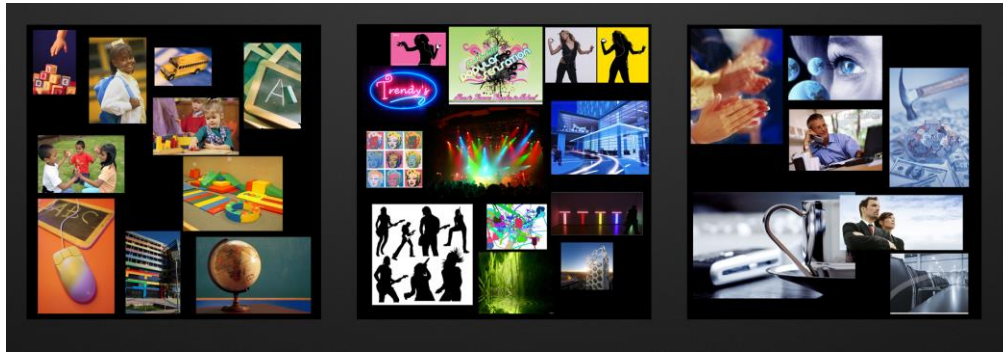
- Mood/lighting
- Staging
- Composition

Mood/Lighting

This can be one of the most overlooked principals of photography. This is what establishes what emotion a rendering or photo is going to evoke. In the below example, the subject in all four images are the same…skies. However each of these photos look and feel different. Where one is calm and serene, another is dark and foreboding. Even though the subject is the same, the lighting evokes a different feel. The same can be applied to renderings.
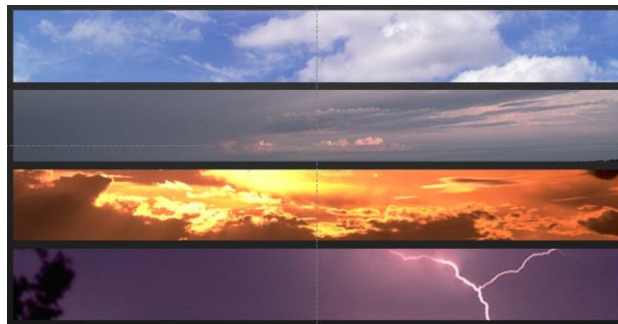
The images below are Mood Boards. This can also be useful in determining the feel of your rendering. The left board suggests that the content will be educational, for children, a school or something for students. The center board is more trendy, or for a younger generation. The right board is clearly more corporate, business and professional. Notice how each board based on the content creates its own color or mood. Your renderings in turn can evoke the same mood based on the colors you choose.

If you're on Pinterest, you may not know it, but it's a nice way to create mood boards.
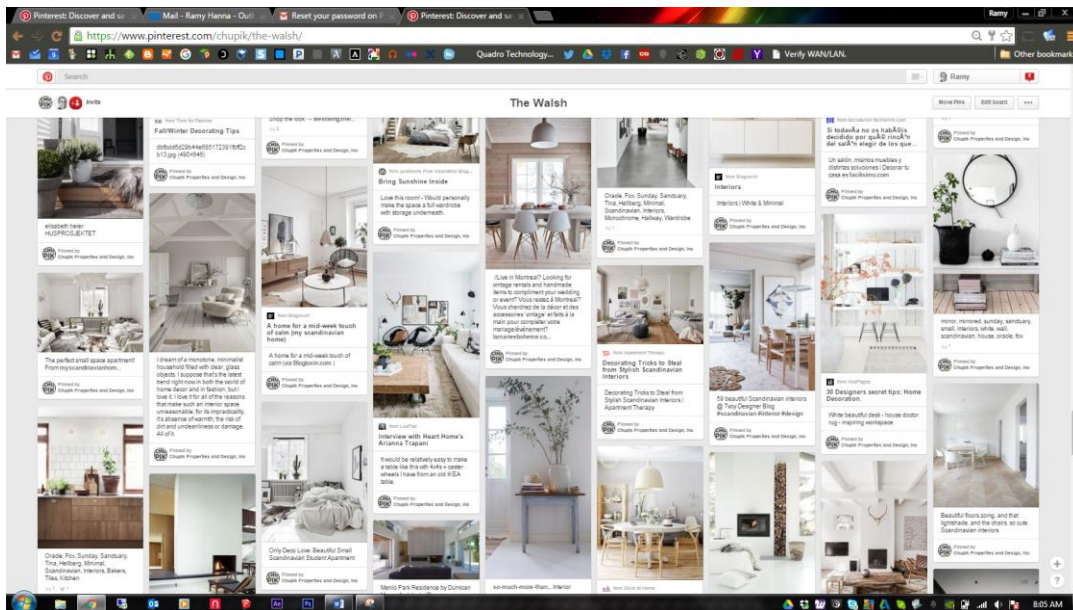

In the image above you can see that the lighting is similar in all the images and controls the mood and theme. It's important to understand how a camera works to control your lighting not only in photography but in your renderings as well. There are essentially 3 factors that control camera lighting:

•Shutter Speed (exposure)

•Aperture (F-stop)

•ISO value (film type)

Shutter Speed

Shutter speed is also known as exposure, and is the part of a camera that exposes light on to film or in the case of digital cameras the sensor.


| 1/500 | 1/250 | 1/90 | 1/40 |
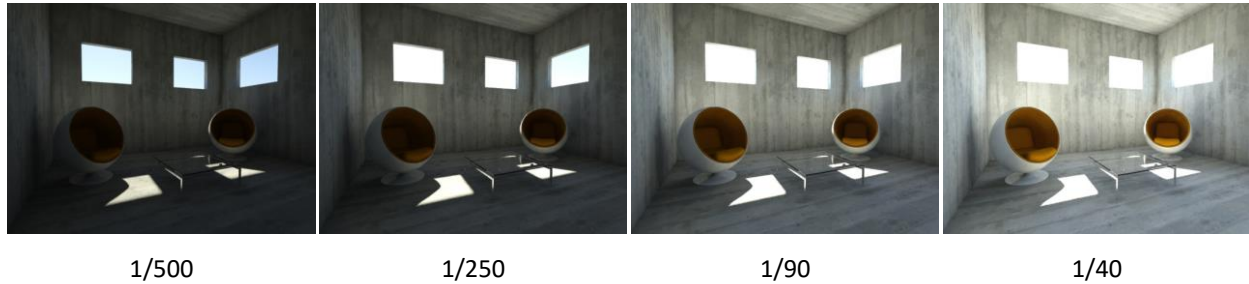
The values for exposure are measured in fractions of a second. So a setting of 1/500 means the shutter is open for 0.002 seconds, while a setting of 1/40 means the shutter is open for 0.025 seconds. The longer the shutter is open the more light is exposed to the sensor or film.

Special Behaviors: The longer the exposure, the more motion blur is captured onto the image.

Aperture (f-stop)

Aperture is the size of the hole between the lens and the sensor.


| f-14 | f-8 | f-6 | f-3.4 |
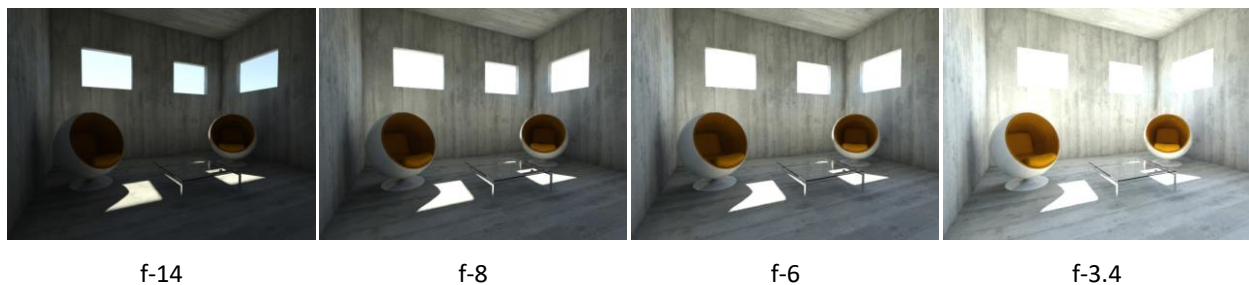
Aperture is measured with an f-stop. The larger the number the smaller the hole. The smaller the hole the less light is allowed onto the sensor / film.

Special Behaviors: The smaller the f-stop the shallower the depth of field, or greater the out of focus effect. Also, wider angle lenses such as 18mm allow for lower f-stop values.

ISO

ISO is also known as film speed. Historically, it refers to the type of film used.
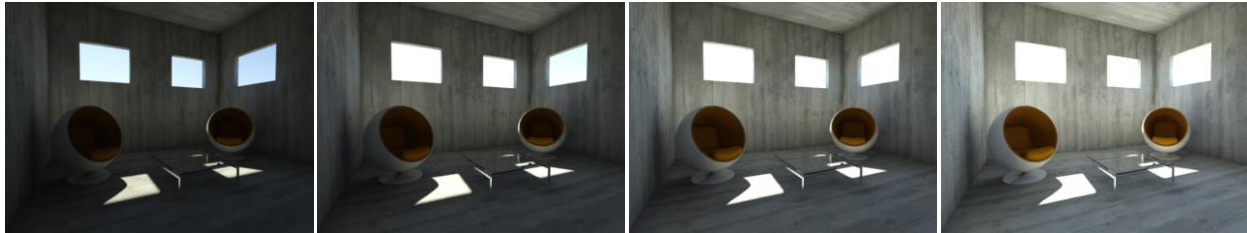
| ISO: 100 | ISO: 200 | ISO: 400 | ISO: 800 |

ISO is measured in numerical values, typically from 100-800. Historically the lower the ISO, the less sensitive to light the film was. On a DSLR, the ISO values are somewhat arbitrary, but function similar to film.

Special Behaviors: On digital cameras, the higher the ISO values the more noise there will be on the digital image. Best methods are to try to keep ISO values low.

Staging

A good photographer will think and plan out their shot before actually taking it. Attention is paid to location of furniture to maximize the effectiveness of a shot.

Composition

This is perhaps the most critical principal of photography, and applying all the rules of composition alone can greatly increase the quality of an image. These are the 4 rules of composition:
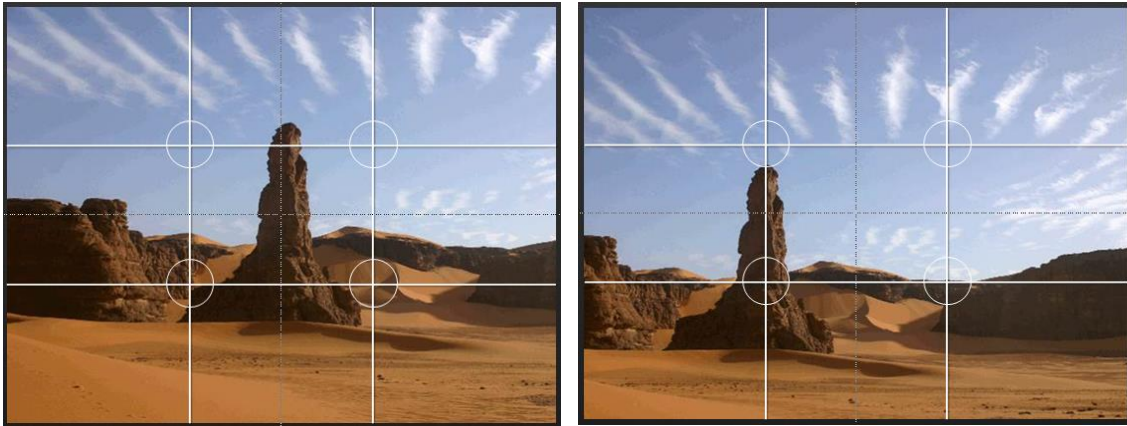
- Rule of Thirds
- Straight Verticals
- Diagonals to corners
- Avoiding coincident edges

Rule of Thirds

This is simply a way of framing your subject or content within a frame. If you break an image into 3 parts, in the vertical and horizontal direction, it will create points of interest. The image on the left is not using the rule of thirds, where the image on the right is. For portraits of people, or characters, you want to focus them on where the lines converge (where the circles are). For architectural renderings or shots, you want to line up your building along the lines. Practicing this habit will quickly create a better composition for your renderings and photos.

The rule of thirds can be created in 3ds Max simply by using the Safe Frames as a go-by:
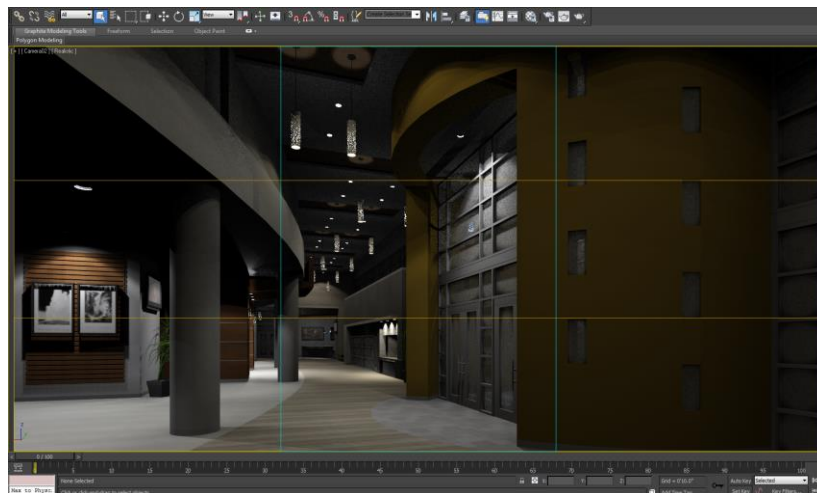

Turn on your Safe Frame (Shift-F), or click on the Camera text in the top left viewport and choose "Show Safe Frames". Now we have to turn on the Action & Title safe. To do this click on the text just to the right of the camera text, and choose "Configure…" Go to the Safe Frames tab, and turn on Action Safe & Title Safe. Then turn off the Locks for both Action Safe and Title Safe. For Action Safe set Horizontal to 66, and Vertical to 0. For the Title Safe set Horizontal to 0, and Vertical to 66. Then at the bottom be sure that "Show Safe Frames in Active View" is checked, and then hit OK.
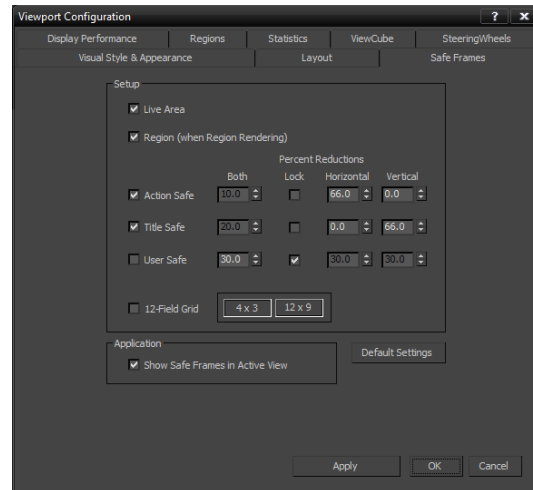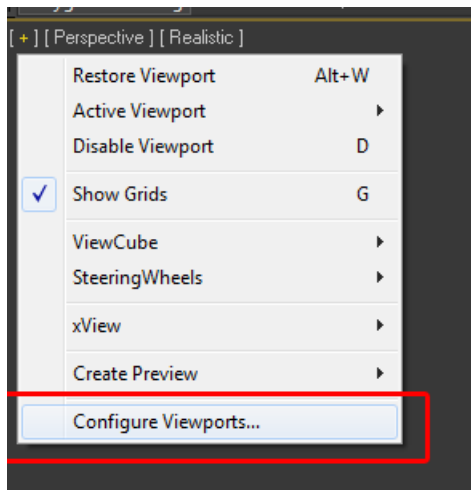
Straight Verticals

This is what I call the signature of architectural photography. You know the photographer was an architect if the verticals are straight. Simply, if you can take your shot and keep your verticals straight, your image will look much more professional. This can easily be achieved in Photoshop using the Lens Correction filter.
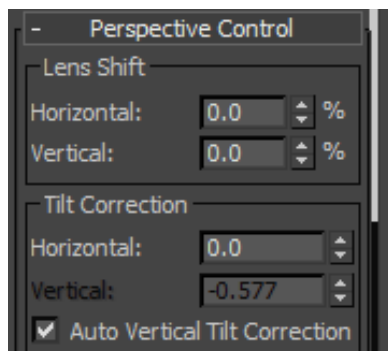
This can also be achieved in 3dsmax. When using the new Physical Camera, the settings under Perspective control will allow you to straighten the verticals by checking "Auto Vertical Tilt Correction"

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Diagonals to Corners

This is a very simple rule. Basically, when your diagonals, or perspective lines, die into the corner of your image, this adds visual interest or a more interesting composition.

Avoid Coincident Edges

This is a rule where camera placement and staging are critical. If objects in an image are placed in such a way that their silhouettes are tangent with other objects, the depth gets lost and the image becomes very difficult to read. The image below on the left appears more flat because objects edges are sitting right next to each other. The image on the right is a better composition because there is more overlap or space between objects. This produces a more legible image and adds more depth.

Photographic Phenomenon

Along with the 3 principals of photography are also photographic phenomenon that can be applied to renderings. Photographic phenomenon are flaws that exist in the simple nature of taking photos with a camera. These are actually effects that professional photographers typically try to avoid. Obvious examples of these phenomenon usually point to the image being taken with a bad or cheap lens. It may seem counter intuitive to apply these "flaws" into renderings. However creating a realistic rendering is simply trying to replicate what the camera does when taking a photo. So applying these to a 3D rendering when used correctly actually brings more life to the CG image. The most common or impactful phenomenon's are:

- Vignetting
- Chromatic Aberration
- Barrel Distortion
- Glare / Light Blooming / Flares
- DOF

Vignetting

This is when brightness is reduced around the periphery of an image. This is traditionally a lens limitation; however it can be used intentionally for a creative effect. This can easily be created in 3ds Max, using the Physical

Camera. Under the Exposure rollout of the camera settings, click on "Install Exposure Control", then check "Enable Vignetting".
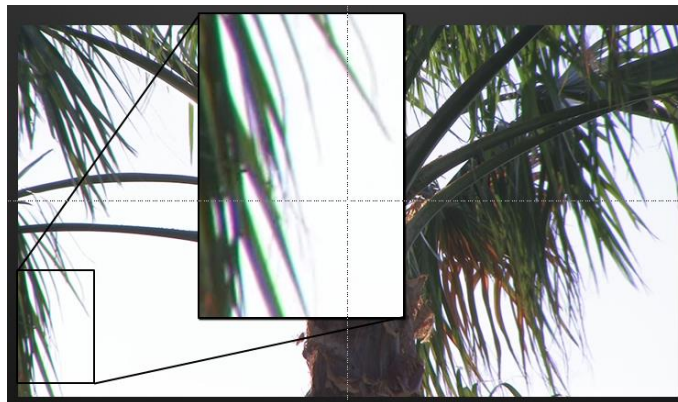

| Vignette=0 | Vignette=10 |

Chromatic Aberration

Chromatic Aberration (CA) is a type of distortion where a lens can't focus all of its colors to the same convergence point, resulting in color fringing. This is especially noticeable in areas of high contrast such as a tree against a bright sky, or a window frame against the sky.


This effect makes renderings look like a photo, unfortunately it has been very over used, and I have seen this effect executed very poorly to create some very distracting images. When using this effect it needs to be very subtle, and the viewer should not be able to point it out. Just remember, if someone comments on your color fringing, then you're using too much CA. The simplest way this effect can be created is in Photoshop with the Lens Correction Filter.

Barrel Distortion

This is an effect that is caused by camera lenses. Almost all lenses have even a hint of this distortion, and most photos will display this effect. Of course renderings do not create this flaw, but it can be added to your renderings for an artistic effect.
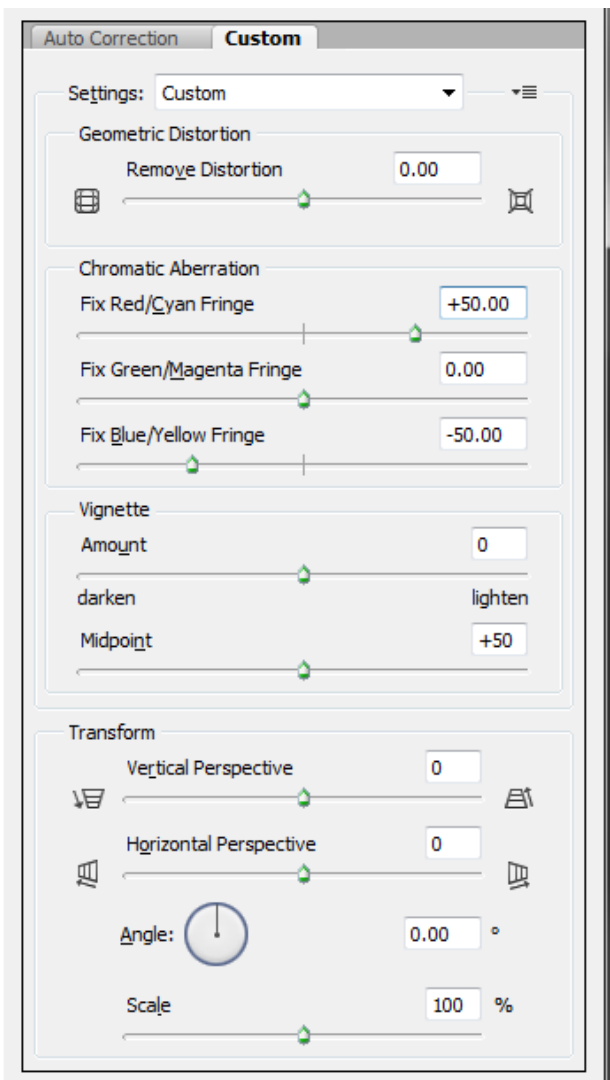
Vignetting, chroma, and lens distortion can be done in 3D, but it's much easier to add these photo effect in post. I always prefer to add these effects in post when I can, as you can see the results in real time. If you don't like them, then you can undo them.

These can be achieved in Photoshop or After Effects. In this example , open your image in Photoshop, then go to Filter->Lens Correction. Then click on the Custom Tab. This dialogue gives you access to all the effects described above, and the results are instant.

For Chromatic Aberration, I typically go positive on the Red/Cyan and negative on the Blue/Yellow.

For Vignetting, you can control the amount as well as the spread of the gradient.

Glare / Light Bloom / Flares

This is caused by strong light sources scattering into the lens usually into unwanted shapes. This effect can cause images to look washed out, or create starbursts and rings into an image. Again usually undesirable in photography, but can be simulated into a rendering to make it look photographic.
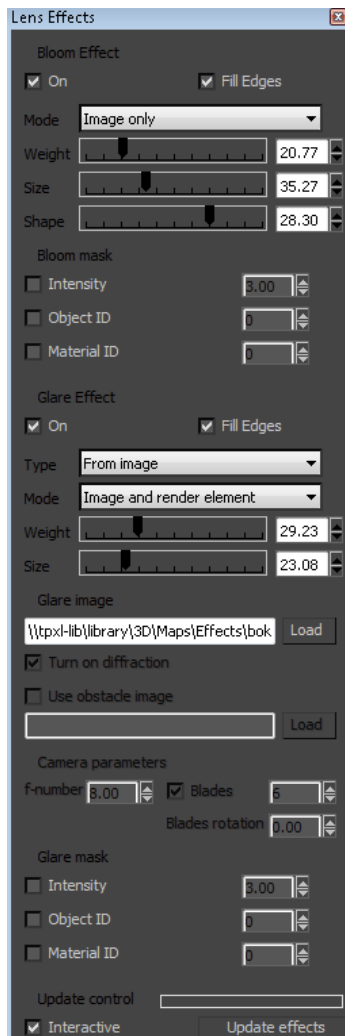
There are several ways to create this effect for renderings. With v-ray, this can be created using V-ray Lens Effects. To access this dialogue, use the v-ray frame buffer and click on the last icon at the bottom of the render frame buffer.

This opens the Lens Effects settings. These settings apply post effects to a finished rendering. There are several controls that can create many streak effects between blooms and glares.

It offers real-time feedback by selecting the bottom "Interactive" toggle.

You can also drive the glare, by a custom image file to control the color, streak and direction.

What's really powerful about this tool is the ability to split the image and generate render elements for each bloom and glare effects. To do this switch the mode to Image and render element. Once this is done, it creates the corresponding elements.
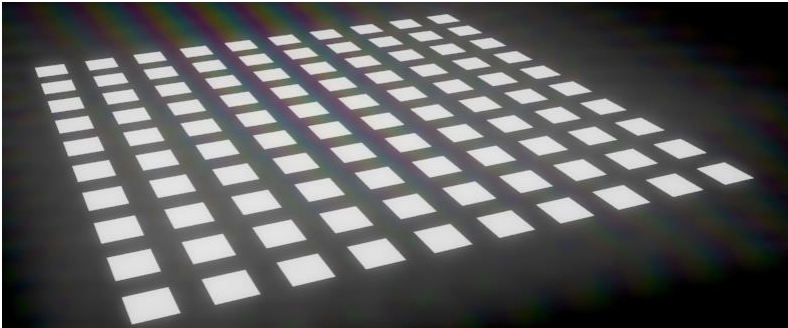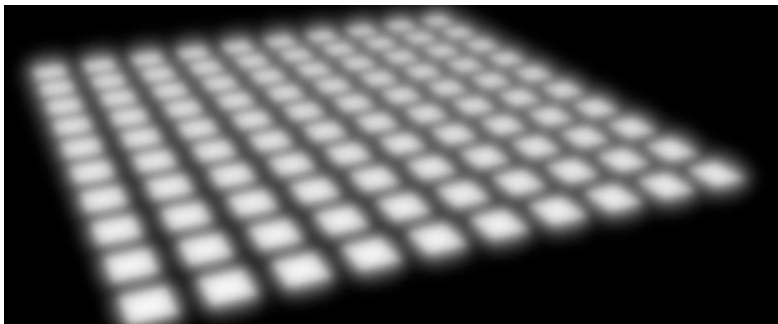
Image and Lens Effects

Glare Element

Bloom Element

Grain / Noise

This effect in photography is often caused by having a high film speed on the camera. A high film speed (ex: ISO 800), is often used in dark settings. This will allow more light to be exposed but at the cost of increased noise in your photo. We can also add grain or noise to our renderings to give it a photographic feel. Adding grain and noise into a rendering can be a tricky thing as renderings with low render settings generate grainy to begin with.

Typically you will want your rendering to be nice and clean, then you can go back and add grain where you need it in post or Photoshop. If you follow the below rules, you can add grain in the correct spots to make it look real:

•There is more grain in areas or images that are darker.

• Daylight images are typically free from grain or noise.

•There is more grain in areas that are more out of focus.

Resources

There are many resources for the arch/viz community, and knowing where to go can be the key to giving you an edge.

There are plenty of resources on the internet for creating images with post work for architectural visualization. Some websites that are chalk-full of knowledge are:

peterguthrie.net

area.autodesk.com

ronenbekerman.com

cgarchitect.com

bertrand-benoit.com

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