RAMY HANNA: Are we good? OK, let's go ahead and get started. So thanks for coming to the class. This is "Render Like a Photographer." And my name is Ramy Hanna. And I'm with Tiltpixel. I'm a partner at Tiltpixel. And as you all are coming in, just make sure you're in the right class.

This is a class I've done now for-- oh, this may be the third year I've done this class. And so if you've done this class before and you're in here, raise your hand. Just curious. Good, so it's all the same material from last year. No. [CHUCKLES] No. Thank you, again, for inviting me.

I think what's made this class very successful is that a lot of the information is really timeless. And it's not so much software specific. And so it's really stuff that artists, and architects, and even engineers can walk away with and use in their projects.

At the end of this class, I promise we're going to learn how to be able to distinguish good renderings and good photography from the bad photos and bad renderings. And we're going to learn that. I'm going to go through three principles of photography. And we're going to discover the four rules of photography composition. And then we'll go through some photographic phenomenon and how you can get some of those renderings to look like a photograph.

So this is our office. And we're in Houston, Texas. And we're a small studio. We have eight artists. And there's nine of us in the office. And we do renderings for architects, developers, brokers. We do some retail work as well.

And we have a VR set up. We have a room dedicated for VR. And a lot of times we'll have clients come in and that way they can experience VR either through Oculus-- of course, everyone says that they're the VR expert. I don't think anyone is an expert because it's such a new technology. We're all pioneers.

And we're very candid with our clients. And we tell them we're exploring this just like you guys. And a lot of times our clients, they don't really know what they want when they want VR and want something immersive. So we have a room dedicated for that. And we do some R&D with that.

We also like to have fun. And so this is an area in our office where our artists-- we work very hard, but we like to play hard as well. And I'm going to show you some of our work, right here.

RAMY HANNA: So that's a little bit of the work that we do. But it was not always that way. So once upon a time, I used to do renderings that looked like this. And I'm being candid with you and showing you my terrible work. And so I did this when I was a student. And I was first learning how to use-- this was actually done in Maya. And I think it's mental ray. But it was years ago.

And it somehow got me a job. I don't know how that happened. But I did this. I'm not terribly proud of it. But I always go back to the stuff that I did a long time ago to see where did I come from. And hopefully, it's encouraging to you to see. I'm sure your work is much better than this. But this rendering landed me a job.

And I started doing work like this. And what's worse about this is someone actually paid me to do this. And I was going along. I was very happy with the renderings I was doing. Some of it's technology has improved.

But one day an architect came up to me and said, "what's wrong with your rendering?" I said, "what do you mean?" And I'm thinking the reflections aren't right. The lighting isn't correct. I'm using the wrong GI solution. He said, "no, your verticals need to be straight." I was like, "what are you talking about?" Technically, it's correct.

And he said, "no, the imagery needs to look right." So he said, "if you look at your verticals"-- and I looked at it. And it's a three point perspective. There's nothing wrong with that. But he said, "look at architectural photography. And if you look at it, everything is straight."

And I started looking at architectural photos. And I thought, he's right. Most of them are straight. And in reality, when we perceive buildings, our eyes-- we view everything as straight. All of our verticals are straight. And so when you have something like this, it looks a little odd. Now you could take a photo like that.

And now I'm going to show you a couple of the works that we're doing now. So this is Walsh. And this is a project in Austin that's actually under construction. And we actually won an ASAI award for this rendering. And it's Scandinavian architecture, but it's in Texas. So it's kind of funny. You wouldn't think that this was Houston, Texas.

But the exterior is all the same. But what's interesting is, on the inside, we actually developed three different schemes, depending on the one that you want. This is the bedroom. And this is

the modern scheme. And we worked very closely with an interior designer. And she selected a lot of the finishes and fabrics.

But instead of having to photograph a set and change all of the pieces of furniture and the light fixtures and the hardware, she said, "can we do several different schemes?" So this was the modern scheme. We went ahead and did a classic scheme of the same space.

And the nice thing about doing it in 3D is we can change some of the beams. We can change the fixtures very quickly. This is a vintage scheme. And so we did the three different schemes.

And now they're selling them. It's the same unit, but we're selling them now on-- it's published on their website. If you want to buy one of these units, come talk to me. I can sell it to you.

This is the kitchen dining area. So again, this is the modern scheme, classic scheme. I'm not so much of a fan of the fabric in the foreground, but I promise that our interior designer knows what she's doing. And this is the vintage. We also did a living area-- modern, classic, and vintage.

This is another project, 1700. Yeah, this is in DC. And I believe it's currently in the works. So this is a dusk version of it, the same space. And this is a detail shot of that corner, so the corner office. This could be your office one day. And on the top floor, we have this terrace area where it's a meeting space. And we have these Won-Doors that can open up out to terrace.

And this is a project that we recently finished that's up north. This is the Alloy, Assembly Row, in Boston. And this was our take on the design. And we sent this to the client. And the interior designer rearranged some things. But we really liked this one. So we stuck with it for our purposes.

This is a project that we just recently finished. And I can't really talk about it or say what it is. But you may recognize the location. And it's more an exercise in activity. And so we put a lot of people into it to make it feel alive.

Or if you don't want to be around any people, this is in Cabo, Mexico. And this is Fifth & West. This is in Austin, Texas as well. And there is an interior designer who worked on the whole building. But then there was a unit that they said, "we need to get something out real fast. We need to put it on the website. Can you guys design the inside?" And so we designed the inside. And this is what we came up with. And they really liked it.

And this is 930 Rose in DC. And we also do some corporate interiors. This is 225 in New York. And again, we designed the interior space to make it more active and make it fun. There's also work space involved. And so it's very open and you can go out to the deck. And what rendering is not complete without a view of the Statue of Liberty?

This is back in Austin. This project is the tallest building in Austin, Texas. This is the Austonian. And the building exists, but they wanted to sell the penthouse. And currently, the penthouse, it has a lot of construction parts and pieces. And it's just bare bones, concrete floors. And they said, "well we want to show what it really looks like."

And so we went ahead and we flew a drone out and took this picture. And we composited the CG in there so it looks like it's a living space. This is the inside of it, the dining kitchen area. There's your wine collection and the bedroom area with a view of all of Austin. And when you're that high up, you can go to the bathroom and you can have full floor-to-ceiling windows and no one is going to look at you. So you don't have to worry about that.

So how did I get to this point from the very first rendering? I started looking at some photography examples. And I went back and started looking at the photography of the greats. And so one of the first people I went to was Julius Shulman. And Julius Shulman, he's done many architectural photos. So I'm going to go through a couple of these.

This is the Case Study House. And the Case Study House is an experiment in American residential architecture. And he was commissioned to do lots of these by-- he was commissioned by lots of architects. And what's interesting about this vote, if you look at it, there's nothing unique about it, or special. But it's actually a double exposure.

And so what he did was he set the camera up. He had these ladies sitting in the dark, opened his shutter to expose the background. And as soon as they turned the lights in the interior, he closed his shutter. But with one shot, it's a double exposure.

Now when he did this, he didn't have a digital camera like we do. And we can take a picture. And we can do the tone mapping that our cameras do and gets the background and the foreground. He did this with film. And so there was a lot of thought that went into the photo.

And so when you look at it, first, there's not much going on. But as far as the composition, and the placement, and the thought, even the staging of these ladies-- can you imagine these

ladies just sitting in the dark looking at each other? There's a lot of thought involved with that.

This is the Singleton House. And it's a very simple photo. And it's a one point perspective. And I love how the building itself frames the image.

This is the Kaufmann House. And there's not too much unique about it. But I love the way that it's composed against nature, you have architecture and then nature. And he has one person in there for scale, really.

A lot of times our clients will ask for activity in our renderings. And I always cringe when we put people in because it's very difficult to put people in. I'm always afraid that the people will draw the attention and not the building itself. And so he does a very good job of putting the person off somewhere where you can see the building.

Ezra Stoller is another photographer. And he was a highly recognized photographer. And he was commissioned by architects like Frank Lloyd Wright, Paul Rudolph, Eero Saarinen, I. M. Pei.

And this may be one of my favorites. This is the TWA Terminal, JFK airport. One, the architecture is beautiful. And you'll find that if the architecture is great, it'll make it much easier to photograph. But the way he composes the photo's what's interesting.

And it has a lot of curves, up in the ceiling, but even this railing. And he uses these just in the right place to compose the image. He also uses the vignetting of the lens to naturally draw your eye up to where the activity in areas. Again, there's not that many people in there-- showing off the architecture.

This is Marin County Civic Center. And what's interesting about his photos is they're very dramatic. And so it's a very strong one point perspective, where it's all converging to one place right here. But what's interesting is he has a person here and cars. And so without the bottom half, you wouldn't really know what you're looking at. You'd think, is this a detail of maybe a hole in a binder somewhere in my desk? Or this could be an IKEA detail, right?

This is Kitt Peak National Observatory. And what I like about this photo, the architecture is not that interesting. But what's interesting is the composition. He has the building, again, framing the image.

And has one person right there. And if you didn't have that person there, you wouldn't know

what you're looking at. You wouldn't know if it was a spaceship, or if it was something very small and detailed. But the person adds a sense of scale and place, right?

So there are also 3D examples. And so in my learning of renderings, I went back and studied some of the ArchViz artists. And this is a piece from Alex Roman's work that he's done. And this is almost-- it's closer to 10 years now. And it still holds up to today's standards.

I remember when these first came out thinking, these cannot be renderings. These have to be photographs, and thinking, why in the world do these look so real? Why do they look so compelling? And so that's part of what drove me to really look at my renderings and make them look more photographic.

This is Vikto Fretyan's work. And he does a great job, not only with composition, but his lighting is very good. And Peter Guthrie has had a good influence on our industry as well. And the work they're doing with the boundaries, very inspiring.

And so I'm going to break this down to what are these principles. What are these artists, what are these photographers doing that are making these images compelling and interesting? Well it really comes down to three principles. There's mood and lighting, staging, and composition.

Now it seems very simple, but what is mood and lighting? Well it really is just the feeling-- or what do you get the sense of when you see an image. Now what's interesting about this is the subject between all four of these skies are the same, right? It's all clouds, air, atmosphere. But they all feel very different.

And when you watch the sun rise every morning, it always rises the same way. But it always looks different. And every morning you know that the sun is going to come up. And you know that there's sky in the air. You know that there are clouds. But the way that the clouds, and the atmosphere, and the contrails from the planes, and the way that God paints the sky in the morning, it's just different every day.

And so here we have a beautiful sky right here. It makes you feel like you're in a good mood. And you're happy. And you want to go outside. This tells you that there may be a hurricane coming, run for cover. But the subject is the same. Well, we do the same thing with our renderings.

And we can put together what's called a mood board. And if you look at these, they all tend to have the same theme as far as color, content. When you put all these images together, it

makes you feel like maybe we're going to do a rendering of a school, something for children, something elementary, very colorful.

When you look at this mood board, it tells you maybe it's for something that's more fun, for maybe a little older age range. And then when you look at this, it tells you that maybe we're doing an office space, right? Something very cool, pristine, professional. And so they all feel very different. And when you put them together you get a sense, OK, this is where our colors should look in the renderings, right? So that's mood and lighting.

And for example, this is a rendering that we did several years ago now. And we sent it to the client. And he loved it. But he said, "I want more drama. Can we make more drama?" Without changing the architecture, or even the composition, we just changed the mood of it and change it to a dusk shot. And all of a sudden, it brought the drama that he wanted. And I think it ended up being very successful. So that's mood and lighting.

Now staging is another aspect. And this is something that Julius Shulman was an expert at. So this is an empty space. And there's nothing unique about this. I rendered this box out. And it's just a box, right? So there's nothing very interesting about it.

But what Julius Shulman would do was he would find a location that he'd want to set up his camera. And if the architecture was great, he'd say, "this is a good place. I'm going to put my camera here." And then he would stage it so that the items of the furniture, the light fixtures, would support the architecture.

And so it's just that. And that's what we do in a lot of our renderings, is we'll find the best place for our camera. And then we'll start moving things around to support the image. And it saves us a lot of time.

Now composition is a little more complicated. I'm going to break composition down into the four rules. I broke it down to the rule of thirds-- which I'm sure you've heard about-- the straight verticals-- which is what got me into this mess in the first place-- diagonals to corners, and avoiding coincident edges.

Now rule of thirds, you've heard that. You've heard good things about it. You've heard bad things about it. People have told you to avoid it. It's dumb. It doesn't make sense. It's useless. For other people, that you must abide by it. So what exactly is the rule of thirds?

Well the rule of thirds was discovered by this guy named Euclid. And he's a mathematician. Now he didn't invent it. He just discovered it. And it's this ratio in nature. It's basically where this distance to this distance is the same ratio as A is to B. So it's this repeating pattern ratio.

And it's found in nature. You find it in shells. You can find it in flowers. You can find it in the circles of hurricanes. And so it's all over the place. And so it's very interesting. And it was observed, because it's nothing we invented. And so architects started using it in their buildings. And because it was found in nature, it was not only thought to be visually pleasing, but also spiritually important.

And so this is where we get the Fibonacci spiral from. And it's the same ratio that you get. It's this repeating ratio. And there were other artists who also understood Fibonacci's spiral. And if you broke the Fibonacci spiral down, this is where you get the golden section from.

It's just a simplification of that Fibonacci spiral, the golden section. And from the golden section, the adaptation of the rule of thirds came from. So that's where we get the rule of thirds. And the way it's used is more for composition.

So we have a landscape, here. And if you composed your hero subject and your horizon, or anything that's important, along these lines or areas of intersection, all of a sudden the composition becomes more interesting. So just with a simple crop-- it's actually the same image. Just with a simple crop, the composition becomes much more interesting.

So I went back into some of our old renderings. And without really using the rule of thirds, I was just interested to see if it lined up to my renderings. And sometimes it worked. And sometimes it didn't.

But I think knowing where these are is somewhat of a guideline-- was not only interesting, in some instances it is helpful. Sometimes it works. Sometimes it doesn't. But you can see there are definitely areas that are working.

And so I went ahead in 3ds Max and said, how can I come up with a rule of thirds if I want to set up my camera? So in 3ds Max there's an area called Show Safe Frames. And you can turn on your Safe Frames. But there's also an area where you can turn on the Action Safe and Title Safe. And so if you go into the Configuration Settings, there's this Action Safe and Title Safe.

And really, all those are are just areas for broadcast, where you're saying, OK, this is the area that's safe for your image. But I went ahead and tweaked it. And so you can adjust these

settings. So I unlocked them. And for the Action Safe, I set that to 66%, the vertical to 0%. And on the Title Safe, I did the opposite. I set the horizontal to 0% and the vertical to 66%.

And when you hit Apply, all of the sudden, you get this grid. Now I know that the developers of Autodesk did not invent the Action Safe and Title Safe to do this. But somehow, it seems to work.

So this is a photo I took several years ago. And as you can see, I think I took this even with a good lens. But when you're in such a vertical space, it's very difficult to get straight verticals. If you really wanted to do it right, you could get a tilt-shift lens. And you could sit there for hours and try to tweak it.

But you can also do it in Photoshop as well, which is what I did for this image. So you can see that these columns are not straight. So I went ahead and straightened them out in Photoshop.

Here's some more examples of straight verticals. These are schools just outside of Houston, Texas that I've worked on at an architecture firm awhile back. So in 3ds Max, you can also straighten your verticals. And if you select your camera, we have, now, the wonderful Physical Camera.

And if you scroll down, there is an area called Perspective Control. And it's a magical button. If you just hit this Auto Vertical Tilt, it will straighten everything out, which is very nice. So you don't have to figure it out. It will do it for you. Again, you can also do this in Photoshop.

And the easiest way to do this in Photoshop is with the filter and then there's a Lens Correction. And our Lens Correction allows you to do lots of things. It actually allows you to control your barrel distortion, which we'll get to later. But this transform, right here, allows you to straighten your verticals.

Now what you'll notice is you are going to lose some of your image up here. Because as it straightens out, the areas that were three-point perspective are, now, being stretched out. But I would prefer a straight image to having more of the content at the top. Then you can also use this Straighten tool to rotate it so everything's straight.

So the other principle of the composition is diagonals to corners. And this is probably very obvious. And you may be doing this without even thinking about it. But it's the idea that you have these horizontal lines that lead to the corners of your image. That's what I mean by

diagonals to corners.

And so you can see here that we have this column. And it leads very nicely to the corner of your image. And if you imagine there is an imaginary line, here-- the bottom of this line of this building leading to the corner of this right here.

The other one that's maybe not so obvious, or it's more interesting in the world of 3D, is avoiding coincident edges. So what exactly are coincident edges? It's this idea that in 3D everything's in real space. But when we render, everything's flat. And so we want to make things feel as three dimensional as possible and give as much depth as we can.

So if you'll notice this coffee table is lined right with the corner of this floor right here. And it's lined right up with the corner of this credenza. And it's just a coincidence that they're lining up. A lot of times our artists will set furniture in the space. And they're unintentionally doing this. But then when I look at it, it feels just a little wrong.

And it's almost the same thing as doing a crop on an image and making sure that your image has enough breathing space around the building. It's the same thing with furniture. And you want to make sure that you give it enough breathing room.

And so just with adjusting the furniture a bit, all of a sudden the composition feels a little better. It feels like there's a little more depth. You can tell the coffee table is in front of the wall. You can tell that it's in front of the credenza. So that's coincident edges.

So now we get into photographic phenomenon and optics. So what exactly is this? So this is the part that I used to obsess over. And if you remember the very first rendering I did, which was the three point perspective, it didn't have any of the photographic flaws that we have. And so really what it is are aspects of photography that are flaws in photography.

Now photographers, they did not intend for a lot of these to happen. But they happen naturally with the lens. And so you get phenomenons like vignetting, chroma-- or chromatic aberration-- barrel distortion, glare, depth of field.

Now when we take pictures, we don't really think about a lot of these because we're so used to looking at photos. But if you really start to dissect a photo, these are all elements that are in a photo. And so photographers try to remove a lot of these to make their images pristine.

When we do renderings, we try to add all of these flaws into a rendering to make it feel like a

photograph. And like anything, if you add a little too much, then it's obvious that something doesn't look quite right. So it must be done correctly.

So vignetting, all it is is just some darkening around the edge of your image. And a lot of times, you'll get this-- like the TWA Terminal building-- with a tilt-shift lens. You'll get that. And sometimes we use it to our advantage to draw the eye to a certain area of the image.

So like that image that we did, we made it more dramatic. This may be the sky, but there's also vignetting going on, leading your eye to the building. And this can also be done in Photoshop.

And a lot of times I like to do it with a mask. And so I'll create another layer. And I'll create a gradient. And the gradient can be a color. Or it can be desaturated, just black and white. And the Blending Modes, you can either do Soft Light, which works, or you can do an Overlay, which is a lot stronger. I prefer the Soft Light because it's more subtle.

And if you see it, and you think you've gone too much, you probably have. So everything has to be very subtle. But all it does is just add a little bit of realism to that image. You see it adds a little more depth to it. Again, all of these you have to be very subtle with, though.

The other one is barrel distortion. And this is not one I mess with too much in 3d. But a lot of times I'm correcting photos-- sometimes we're doing camera matches-- and we have a photo, and it's doing this, probably not to this extreme. But we want to try to either add the barrel distortion, or remove it. A lot of times, if I get a photograph, I'm removing it. If I have a rendering, sometimes I will add it.

In 3D films, I remember reading an article about Pixar doing WALL-E. And they added barrel distortions to some of the footage on earth. And I thought, really? I don't remember that. And it's because they used it very carefully and subtly so that mentally, subconsciously, you were thinking, oh, it looks so real.

You can add this with the same tool that we used to straighten our verticals. There's an area, here, to remove the distortion. Let's go back. So it's right up here, under Filters. And if you remove this distortion, here-- you can remove it, or you can add it. Typically, if you're removing it, you'll go into this range over here. If you want to add it, you'll come over here.

And the other one is chromatic aberration. And really what it is is the way the lens works, or the way light works with the lens. Really what happens when you take a picture and you have

these areas of high contrast, for example, like this palm against the sky, your camera is trying to interpret what the light is doing.

And sometimes it works like a prism, where it splits the image up. So if you look, you'll get kind of these cyan and magenta tones. So if you have a bad lens, you'll get a lot of this. If you have a very good lens, you may not get any croma, which is a good thing.

Of course, when we're doing renderings and we want to make it look real, we can add chroma to our images. And again, you want this to be very subtle. Otherwise, it looks very distracting, or it looks very obvious. And if artists have seen this, they're like, oh, they're using croma.

You can see, here. You can just slide these to the right and left. And if you look very carefully, you can see the colors. We have a blue and a red. That's with it off. And that's with it on. It's very subtle. What we're doing is mimicking what a lens does when it takes a picture.

One thing that I was going to say, which I didn't include in this, is that if you want to use this correctly, a lot of times you want to use this in the negative. And you can use this in the negative direction in both ways.

If you pull it to the positive side, what happens is you get some clear space. Because what it's doing is it's pulling your image into the frame. If you use the negative, it likes to pull it out. I don't know if that makes sense or not. But you'll see this white line right around the edge of your image, if you go positive.

So another aspect are glares, and blooms, and flares-- and another aspect that our cameras take. And of course, people like to add the lens flare in your rendering. And say, oh, it's awesome.

So this is a photograph of the sales office for Fifth & West. This is my son looking at a rendering in our sales office that we did a rendering of, which is kind of funny. But I took this picture because you can see the subtleties in the light fixture. And I think we had the fixture in the rendering somewhere.

But very subtly, there are some flares going on. If there's some grease on the lens, if it's not very clear, you'll get that in your photograph. Now you can add this in 3d. And in our office we use V-Ray. But there are some tools that are in 3ds Max where you can create this.

And so we added this. We have a blur, a bloom and a glow filter. And what it does-- it's a post-

process. And so it takes your image and then it adds the bloom effect to it afterwards. If you want to, you can split it up. You can have your original beauty pass. And you can have your bloom layer. And you can composite them later.

This can also be done in Photoshop. And I have a library of different flares. And these are photos of flares, which are useful. I'll bring these into Photoshop. And the way I grab them in is I'll do a selection of the black area. And then I'll invert the selection to get just the light areas. I'll pull it into my image.

But then you can still see that you get the little halo, here. If you set the Blending Mode to Screen, then it makes everything that's white, visible, and everything that's black, invisible. And if you're a good artist, you name all your layers. So you set it to Screen, and now you can see just the highlights.

Another thing that's interesting about the flare is that it has to point towards the center of your image. So that's something I learned a little later. I had the streak going out towards the side of the image. And an artist told me that's not correct. That's not how a lens works. It needs to point towards the center of the image.

And again, subtlety is important. So typically, I'll bring the opacity down from 100%, maybe 10%. You can also color it, sometimes. I'll add an Adjustment Layer and color it so I can control the temperature of the light. If I want a warmer light, I can do that in Photoshop. You don't have to do it in 3d. And I'll delete areas that just seemed too obvious that it's a flare, right? So I'll go back and make it subtle. Duplicate it.

So the other one is depth of field. And depth of field is another effect that a camera does. It's the way that it perceives focus in your lens. And it's very dependent on several factors. It's dependent on your f-stop. It's dependent on your focal length. So if you have a very wide lens, if you're a 14 millimeter lens, you're really not going to get this effect as much as if you have maybe a 100 millimeter lens.

The other effect that I said, the f-stop, is really your aperture. So the lower your f-stop is, the greater this effect is going to be. So this can be added in Max, of course, with a Physical Camera. So if you select your camera, there is an option down here to enable depth of field.

And what's wonderful about 3ds Max, now, is you can actually preview it to see how strong that effect is in reality, in real time. And you can see it's on, but it's very subtle. And the reason

for that is because my f-stop, my aperture, is at eight.

So when it's eight, it's a very small aperture. But when you set it to one, what you're doing is you're enlarging the aperture. And so you're increasing that effect. Now very rarely will you find a lens that's an f/1.0. They're out there.

But what's nice about Max is you can control exactly where you want the focus to be and how much you want. And you can get that preview now, which is nice. Previously, I used to have to change it, render, and if it wasn't right, then I'd have to change it and rerender again.

And what's nice about the Physical Camera is there are also other flaws and phenomenon with the depth of field, such as the aberrations that you get with bokeh. And so they included that in this. So if you go down, there's a bokeh area. And all it is are the little circles that you get. It really mimics the way that the-- blades on your aperture cover. And so sometimes it's circular. Sometimes it's a certain shape just based on the shutter. And you get this ring effect.

So this can also be done in Photoshop. And if you're familiar with Render Elements you can render out a Z-Depth Pass. And all it is is a pixel color amount in 3D space. And so in this example, white is very close, and black is very far away from the camera. And so we use that to determine where things are in 3D space, in Photoshop, in two dimensional space.

So here, I'm using a lens blur. And I'm selecting my Z-Depth. And I was a bad artist, here. I didn't name my Z-Depth, Z-Depth. It's just Alpha. But you can see that you can control the amount of blur, here. And you can click-- simply click on an area-- and it'll use that area to focus on. And you can adjust different things, like the brightness and the threshold of the intensities to get the effect you want. And the nice thing about doing it in Photoshop, again, you get that real time feedback.

Now if you do a comparison between the two, you can see that there are subtleties. Obviously, Photoshop is much faster. But I think there are subtleties in the renderer, which are much more realistic, and much more accurate.

Now there are lots of different plugins that you can use and posts that give you different results. We have a plugin that we use in After Effects, called frischluft, which works great. But if you can render it in, especially for animations, it always looks really nice.

So all those principals together are what create our images. And I think, after we added all those principals together over the years, I think I've learned that I'll push them too far when I

learn a new feature, that I get really excited about it. And I'll push it really far.

And I'll do depth of field to the extreme. And someone says, that's too much. And so I'll come back and tone it down. And so all of these need to be used very subtly. But I think all of these features together really are what make your image look real.

If we look at the summary, it comes down to the three principles of photography, mood/ lighting, staging, composition. If you remember these, I think these are more important than these. These are kind of little icing on the cake. But these will bring your image 99% there. I think the photographic phenomenon, maybe that last 1%. And it needs to be very subtle. And I've seen artists use it to the extreme. And sometimes I try to avoid all these in 3d and I'll just stick to the render.

So those are the three summaries. But that's all I have. And if you have any questions, I can open up for questions. Do we have a microphone running around? Do we need-- This one right here. OK, I guess they want us to come up to the microphone if you have a question because we're doing a live feed, and live recording.

So does anyone have any questions? No questions? Wow, you guys are experts. Great. Well thank you so much for attending my class. If you want to follow me, I am on Twitter. We do have a question? Ah, we have one brave soul. The microphone is intimidating.

AUDIENCE: So I'm wondering if you're ever asked to do more sensorial images, or if you're more sticking to the photographic, realistic type renderings.

RAMY HANNA: We have done non-photoreal renderings. That's a good question. It's not often we get that request. I think a lot of times architects will do non-photoreal in-house. But we have gotten that request. And a lot of times it's because they want to keep things very ambiguous with the design. Things aren't always solved as far as even mullion details on a building.

So if we try to keep things ambiguous, sometimes they'll come to us at that stage for something non-photoreal. If they know what it is and they say, "here's the construction documents, let's do a rendering," then typically they want photoreal. But we're finding that they come to us more often for photoreal than non-photoreal. Yeah, but we have done non-photoreal. Yeah.

What's interesting about the non-photoreal is it actually, in some ways, it can be more work

than the photoreal. And it was a strange discovering when we said, "all right, let's do some renderings and make them look non-photoreal." We did the renderings. And they came out from the software looking real.

And then we said, OK, now we have to pull them back and paint them and make them look artistically nice, like a watercolor, or something ambiguous. And so in some ways, there can be more work involved with a non-photoreal rendering, which most people don't really realize. Any other questions? OK. Well thanks for coming to my class. You can follow us.

[APPLAUSE]

RAMY HANNA: Thanks.

[APPLAUSE]

RAMY HANNA: Thank you. Follow us. And then don't forget to vote for the class.

[MUSIC PLAYING]