Making Experimental Cinema with Unity with Mario Mu

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**SPEAKERS**

Jamin Warren, Mario Mu

**Jamin Warren** 00:00

 That's okay. Hello. All right. Well, thanks for joining us today we're expecting to others, so maybe they will, they will filter the filter and my name is Jamin and I run I run kill screen kill screen is an arts and culture organization based out of based out of Los Angeles, we're committed to advancing the practice of interdisciplinary play. They're founded back in 2010 initially as a as a magazine and a website and our big thing is trying to drive the drive the intersection of design culture and impact through cross disciplinary collaboration to show the world why play matters. Just a couple housekeeping notes here so this was this Mario showed Iran I'm here to support if you have any questions Darko feel free to like to use the chat button. If you have any technical issues or anything like that. This is going to be recorded. It'll be shared with you afterwards with a machine generated transcript. If you have any questions, obviously, feel free to chime in. So yeah, without further Do Mario, do you want to give a little background of yourself and a little bit of an intro? And, and I will I will recede into the background.

**Mario Mu** 20:09

Yes. So hello everyone, my name is Mario. I'm a visual artist and filmmaker. I work with computer models and software to create cinema, we could say the main focus of my practices, exploring the tensions between cinema and gaming. This is why we are here today. Um, my background is in painting and experimental cinema. During my studies, I was also working in gaming industry. So when I was graduating, I wanted to get these experiences together. And since then, I was working with the game engines. In my research, I have been dealing with questions of architecture, labor, political perspectives, and various systems of control. So I guess my main position is to observe gaming as a built environment just just in the same way we can see architecture as a spatial practice, we can see gaming also as a built environment. And probably one of the biggest challenges today for all of us is that we have to learn how to live and adapt in a world that is built with images. So whenever we are scrolling through social media, or we are playing video games, we are meeting people in metaverse. We are using virtual realities and augmented realities, these are all worlds surroundings environments that are built with images. And as a visual artist, I find this position quite challenging. And working with game engines given gives me a possibility to immediately direct to immediately and directly intervene into the, into this world. So today in the workshop, I would like to start with some common things that gaming and cinema share. Then we will learn more about distinctions. And understand some of the history of the Machinima, open worlds and sandbox games. And from there, we will see that how we can understand gaming as a built environment, which gives us all an opportunity to have a discussion on world building, which is quite important. And from there, we will get our hands on the software, we will go into the some examples of my work. And I will show you in through two sections, how to work with Unity game engine. In the first section, we will build a certain surrounding let's call it we will build a certain reality. And then in the second part, we will document that reality we will work with cameras and filmmaking to get those images out of the space that we have created. Should we wait for someone else? Or should I just jump into the

**Jamin Warren** 23:30

Yeah, we can just keep keep keep rolling. We're gonna show the recording afterwards. So

**Mario Mu** 23:34

okay, it's Monday, what can you do? Yeah, of course. Yeah. Um, so, I would like to give just introduction into different relations between cinema and gaming. So one fascinating thing for both mediums is their capacities to bring in many different art forms. At one place together, a painting literature, performing arts theater. Both gaming and film can have all of these art forms at one place like a Gesamtkunstwerk. In as well as music. And when we talk about gaming and cinema, we have to understand the principles of recording reality and constructing reality. And I believe that every time we are intervening into a certain reality, we are actually creating a fiction, and the boundaries between documentary and fiction are very blurry. In 60s In 1960s, we have the French filmmaker Agnes Varda, she would often take the actors in the scene in the street life in the scene. instead of the everyday life, so actors would enact a certain story, and the city would become a character. And there would be this tension between documentary and fiction. So we ask ourselves, what does it mean to construct the reality? Or what is documentary? Does it? Can we even say that something the recording reality and documentary material exists. Sergei Eisenstein, a Russian filmmaker, would argue that the most important thing about cinema is a montage. A montage is equivalent to a collage in visual in visual arts, so is the way we assemble things together, we have recorded the reality, we have recorded some scenes, but the most important thing is how we are putting them together like a language or like a sentences. And from this perspective, from this point of view, we understand the most important thing about cinema is that filmmaking and cinema are time based mediums. And when we talk about gaming, we, we see that gaming also has time as a main component. But in movies, we are working with images in time. And in gaming, we work with images moving, both in time and in space. And this spatial component is very important. Here, we start to understand that the gaming is also a spatial practice. This brings us to a cinematic terminology of Ms. insaan. It's a French term, which just explains how things are arranged in a scene in, in the space where we are shooting, or we are when we are, where we are performing, how things are arranged, and also how actors are moving throughout the scene. The atmosphere or the lightning, and missing sun, we can easily understand when we think about cinematography. So it's a built environment, a setting a stage for our performers. And finally, we see that production of images and the production of space are of a huge importance for both gaming and cinema. And now we will start to understand that gaming is also a built environment. Rather than talking about distinction between virtual and real, we just take in gaming as a built environment and we start from bottom up. So I don't know maybe Darko or J men could join in quickly just to to get us all on the same plane. And do you can you tell me about any films that you know that are made with game engines or any artists working with gaming engines? Or do you know any examples of machinima? Any examples of cinema that is made with video games

**Jamin Warren** 28:18

darker Do you wanna go first?

28:20

I I mean, you can go first. Yeah, okay. I will go I don't know. I don't know I'm not sure about cinema. And about artists, artists working with I don't know with moving images, which are kind of I would say like producing in in such a way using

**Mario Mu** 28:48

example, any any approach is a good approach. So

28:54

I mean, yeah. I have no idea. I guess one of the IS is a good example that you mentioned and heater heaters. Tyro also comes to mind. Like working with moving images and

**Mario Mu** 29:15

yeah, that's that's a good starting point. And we can connect the work of hito Steyer with the work of Karen Farooqi. are in therapy already in the early 2000s started to explore these relationships between military and gaming. And maybe I could mention at that era, artists like Corey Archangel career congeal would work with the code to produce abstract images out of the gaming systems. Or nowadays we have the low young, working with gaming and the notion of mortality. or Ian Chang, who is working with simulations. Sarah Sadiq Sara Sadiq works with machinima with Grand Theft out of video games, which are like gangster games, but she deals with the topics of patriarchy, masculinity, as well as colonial, a colonial approach to immigrants in Europe. On the topics of queerness we have Danielle Brett white Shirley and Jacoby, SATTERWHITE Jacoby SATTERWHITE is also I think the one of the most amazing examples when it comes to world building and using gaming, imaginary. So I would say the things started to be very interesting in the late 1990s. When we talk about video games and, and cinema. In the, at that era, there were many people who started working with modern games, I have mentioned Korea congeal before. So people wanted to make their own content using the existing video games, the games that they love to play. And players started to change the code in order to make their own games on the example is half life two. And the players took the existing platform of a commercial videogames to create their own game, a Counter Strike. And counter strike ended up being one of the most famous massive online multiplayer games and the game that depicts, or that features the struggle between terrorists and police. Also very interesting that it that this game came, is started, was available. In the same era, when war on terrorism started to be a thing. These are the early 2000s. So it's a global phenomenon. And people wanted to make their own games using existing boards. But also people wanted just to tell different stories. So they would play the game, but they would enact different scenarios like soap operas, some of them, some of them have been around for 20 or more years and, and then we have open world games. Second Life World of Warcraft, I mentioned, Grand Theft Auto, then you have Final Fantasy, all of these games gave to people a possibility and opportunity to do much more in the open world environments. So you can just relax, you didn't have to do anything, you could just wander around the city or to desert. You could do everyday tasks you you weren't forced by the gameplay, just to you know, jump and strike. And people, people figure out that it's great just to be there just to be in the game space just to inhabit that space. So of course, there were many different behaviors that started out. People were able to act more freely in the game space and using game character, they were enacting different stories later, in 2000 10s. In the last decade, we have the emergence of sandbox games. So people are now able to build their own environments like in Minecraft, or people are able to make their games are made. So you can make your own game like in Roblox and the engagement is getting the engagement is huge. And finally, we have the availability of PC builds, and gaming laptops. So people now can create games on the home budget. I would, I would connect this to 1960s. And with television and film, which was always depending on beautiful on huge projects in 1960s You have arrival of handheld cameras, like 16 millimeter, eight millimeter cameras, so people started making home videos, and this helped for emergent emergent. Obviously, this has helped to spawn the video art and video artists started to create a completely different cinematic arrangements and to think differently about moving images, and even more importantly, video art then again have influenced the mainstream cinema. For example, Martin Scorsese, who was his cinema is completely influenced with the independency in mind, video art and of the 1960s. So we let's say we are in the present stage, and we have covered the situation quickly. Now, the final thing that brought us into a possibility of experimenting with gaming imaginary is the sort of sophistication and availability of game engines. And when we talk about video game engines, there are generally two most popular. One is unity, and the other one is unreal. And people are always discussing their debates which one to use, I would say for myself, I'm using Unity, because with Unity, I have more space for experiment, unity, has a really good backbone, a very strong backbone. And then on top of this, you can build your own systems. And a benefit of Unreal is that you have a lot of templates or pre made assets, where you can, for example, very quickly make your own first person shooter game or make your own racing game. And, most famously, with with Unreal, you can get a really decent graphics very quickly and very easily. So a high definition hyperreal The graphics are quite easily to achieve with Unreal quickly. But in the end, if if you want to do things properly is the same. Maybe it just depends on if you want to learn code to code or not. Or if you're already coding, coding, which coding language do you use? So I would never recommend to someone to use one specifically, try to see what do you want to do? What is the approach? What is the scope of your project? How many people are working on it? And what are the skills that you are bringing in already, and then take one game engine and learn it completely and master it. And in the end, you will be able to understand the principles of of any game engine and transition just then what to depend on from project to project. Another maybe two other benefits of it unity for the community. Unity has a huge community. So whenever I encounter a problem, whenever I encounter some obstacle, I can always google problems and easily get solutions through the community. And the other benefit for me is the Asset Store. So there is a lot of items that I can easily incorporate through the game engine, I don't have to build things from scratch. For example, I don't code I don't know how to code. But I was able to build so many environments and make so many videos read it without knowing how to code. So to mention American scholar, Alexander Galloway, who wrote a lot about video games and gaming in general, he argues that games are all about that the games are actions, and I will definitely agree with him. So games are all about doing things. And the principle of interactivity is the most intrinsic principle for games and the feedback loops. And then for us the challenge is how do we engage? Or what do we do with this? What do we do with uh, with production of images and the production of space, talk about built environment, or I have mentioned that we can see games and architecture on the same plane. So now we can see images as constructions and filmmaking also as a spatial practice in the context of gaming. And to get in touch with Darko and Jamie, and again, would you be able then maybe to give me some examples of world building how or how do you see world building? Do you have some insights? What are the characteristics of world building or what are the examples? I'd say creating a sense of scale. Could be one aspect of it kind of Like when or if it's an embodied experience are you like situated in side of a larger space? Narrative also like might be a big piece of it, if there are characters that you need the characters that you're looking to build out or what your story might be inside of that environment. Those are two like, things that come to mind for me.

40:26

Yeah, I would say, I don't know, like, maybe physics and I don't know, maybe like law of gravity or breaking laws

40:40

of how things are like, yeah, what are what are like the dynamics of building worlds? And also like, when you mentioned interactivity,

40:56

I was thinking about participation like, or like, if we can if we can see. Or, I mean, I meant to ask this maybe later. How much not only of playing, or like moving to the space of the world, but how much of the building can actually be like, participatory? Is it like? I don't know. Like, how much of the use of the software is, yeah, available for for? Like, can it be seen as a participatory practice? Like, can other people join in and like, build stuff? And?

**Mario Mu** 41:48

Yeah, so on the example of working with Unity, I have mentioned community, and you are a part of some ecosystems, the there are numerous people who are working on their own worlds. When I talk about world building, I like to think about many different worlds that exist simultaneously. And here we can start talking about overlapping worlds or Worlds in Collision. Some worlds can destroy each other, some of them can, you know, help to build other worlds. And I would say that falling in love is also a form of world building, you're creating a world together. But in general, on the Wikipedia level of knowledge, world building implies imagining worlds world building implies creating imaginary worlds creating fictional worlds. So I would say that we're building is the process of constructing a world originally an imaginary one and sometimes associated with the fictional universe this is the kind of a common knowledge and some examples would be Lord of the Rings, or a Marvel Universe or a Star Wars. These are the like, galaxies, delicate universes, where everything is crafted, how how, how planets look like what Tolkien for example, would came up with a completely new language for his characters, what are the physics? What are the basic principles of nature? What are the politics what are the ideologies in in literature, we have great examples of orsola Kay like Wayne or Octavia Butler, they would use science fiction template in world building to deal with the topics of ideology utopian thinking and political perspectives of their of their times. So, architecture creating cities also implies world building when we are creating some kind of spatial environment, we are creating social environments, because we are fostering human behaviors. Every architecture architect will tell you that you we are creating buildings and then buildings are creating us the space also creates us the space that we have created. So there is a constant exchange. In the context of ecological crisis. We can also talk about world building when we talk about geoengineering and terraforming. But world building doesn't have to be a spatial practice we can if you start the political party, that's also world building or creating brands. They branding manager will also often talk about a A world building. And I like the example of American composer, Meredith Monk, when she's a musician, and but when she makes music, she doesn't talk about writing music or composing music, she actually talks about world building, and she's first creating a world and then she is listening to it. And that's very, that's fascinating. So she is creating a world and listening to it, and then trying to react to it. And her music practices practice of world building. So I would say that the world building starts from our own ways of seeing and whenever, you know, when you when you we will now very soon start building things in unity. And as soon as you are, even if I give you everything that is pre made, all the assets, I'll give you everything that I made, very soon Darko will create his own world and Jamie will create his own it will have something from me but the more you will participate in that process, the more it will start to have the experience of dark or Jamin. And so we have overlapping worlds, something comes for me and then you are taking it on. And so, I world building is not something that exists just for one person. And that's I always like to think about Worlds in Collision. So for me, I like to think about the ecosystem. It's like a living world and an environment that I don't completely control. So in that sense, I can become a part of this environment if I if I don't control it completely. Of course there is agency but there are differences between agency and control. And in this sense, I can expand the perception of who I am by becoming a space so I would like now to share or Jamin will share an example of of my works sites of encounter

**Jamin Warren** 47:21

Alright, once again, so

**Mario Mu** 47:23

sites of encounter is a trilogy I was working on this project between 2019 and 2022 and it consists of three short related videos they're following a group of characters as they navigate working conditions and so yeah, there it is below below there is so we can see a short trailer we can we can watch a short trailer alright

**Jamin Warren** 47:56

just let me know if you're getting sound Yeah, it's good.

**Mario Mu** 49:29

So that's it. I have the three parts. In each part we have workers going through traditional environments of the 20th and 19th century the factories, the offices and construction sites. So these are kind of a basic tropes and basic language of working condition. And what happens to them is that they are entering A completely new surrounding where they have to perform labor. And this is a Metaverse, this is an unknown territory, and they don't have a language, they don't know how to how to behave. So the, the limits of their perception or delay are also the limits of their language. So they're lost, they're lost in the gamified map of working condition, the gaming techniques are now incorporated into labor and work. And these characters are not only confused, but some of them are terribly. In love, some of them want to stop drinking coffee. So they have other problems as well. And every time they, they rage, the the, let's say, the threshold of perception and are completely going crazy with the whole situation, they transform. And in the first part, in the off in the office, the characters are just pushing it, and the confusion boils until they transform and change into birds. So they transform in a little sparrows, because they can have it anymore. So they need to change. In the second part, on the construction site, these are the migrant workers and they transform into a knightly creatures in the forest. In the last part, they are in the factories, and they have to transform and change. And they, what they do is they they learn how to be a space. So they they become they're becoming a space. So this is like a final transformation. And this capacity to see yourself as space is quite interesting. And they are learning that they can expand the perception. And they can act differently as a collective form. So they are not just people, they are not just workers, they are also technologies, they are politics, they are the environments, they are the animals, they are the sea, they're the sky and so on. So they see themselves as a kind of an in as a network. And now I wanted to show exactly this piece be because I have an example of a working file so I can share with you the construction site, I can share with you the process of how I built the sights of encounter. So you can see how things look in the background. Jamie and can you see my screen? Is it shared? So Mario,

52:59

sorry not to interrupt. I'm curious. Do you have any characters maybe in the in the video?

**Mario Mu** 53:06

Because I can't count. Yeah,

53:09

because this is I mean, I, I don't get the sense that you hear like visible characters from

**Mario Mu** 53:17

yours, of course. So they're just dialogues appearing. And of course, the first thing you would assume is that characters are missing or that they are invisible. So it's a one hour long piece. And it takes takes a while for you to you know, to get the sense of what is happening. But I guess the first assumption is that someone is missing. Or maybe they're invisible or they are ghosts. But as the story goes on, you'll figure out that something else is here at steak, and there are more like internal dialogues later you'll learn that these are the internal dialogues of the various workers that have been working there before. And the sides are checkpoints. So there are the sides of the memory. Where are the memories stored? So you're basically learning about the history of these companies and corporations? Um yeah, but I can't give you all spoilers there is more. Yeah. Oh, wow. Okay. Let's have this one instead. Yeah, I was talking and then and I didn't look at the file. And let's, let's have another try. Okay, so yeah, just one last thing, you know. When talking about checkpoint, I am let me see what's my Alright, so when we talk about checkpoints these are the role of a checkpoint in a game is that you can save your progress. And every time you come back to the game, you start from the same place where you were last time. And this is like a process of remembering. So in the sights of encounter, I took this idea and put it in the relation with the idea of mnemonic palaces and memory architecture. You know, in ancient Greece, poets and artists would remember songs that would take you like, I don't know, 16 hours to perform by using this method of having a mental space. And they would put all of these things inside of the space. So when they would start to perform, they would enter this space, and as they are encountering, they're triggering the memories and indeed, through this technique, also people are able to learn, you know, how people can remember I don't know 880 1000 random numbers and then recite you this number, they also use these techniques. So, I guess the the the ways technology is changing has to do something with our cognition, and we need gaming and we need virtual reality to better understand our own cognition. And one important thing about this specific example is that memory is connected to images. So, how do we navigate through the world that is built with images and you know, what is the role of memory here this is and how the job the sense of navigation and the moving through the space. So, on the screen, you see a construction site a set of assets, 3d models that I have created for the level, which I call the station to station. So, this is like a transitory space that appears in the video and for example, on my left side in Unity list, I have all of the things that are main ingredients in this scene for example, the brakes the floor and so on the ground and I can do this I can take some things out. So you can see how simple actually the scene is, there is so much happening and I wanted to share this with you just to see how a simple the, the actual setup is and how and how can you from a very simple 3d model Build quite sophisticated imagery. So and a good thing about unity is that you can work with the camera and the lenses, so you don't have to bother that much on the level of sophistication of your 3d model because later you can play so much with your camera and with your postprocess volumes something I will explain more later. But these are my egg example assets postprocess folio, and on the right side, you can see that I have defined with this section, color grading blue motion blur depth of field, and I'm changing completely the atmosphere and the mood. And from this very rough, let's say environment. I can create a quite a vivid world. So I'm bringing back these two models. They are interesting because these are the three models that I have found in the Unity Asset Store. So Unity Asset Store is great because there are so many free models that you can use. So this is also a community shared process. And these are actual building, but I decided just to put them horizontally because I liked the walls and they helped me to have Have this brutalist steel, you know, concrete and steel look. So I just put them horizontally, you have no idea that what they are, but now they serve the purpose, they are the tunnel, let's say, and you see what I want you to see. And I don't, I need to do this, if I press the play button, I'm, then I'm finally starting the game. And we go from this construction of the scene into the actual game. And now you can see a completely different thing, this is the final thing. So the first thing I do after I construct the site, after I build it, after, after I build environment, I put myself in the position of a tourist or a wonder, I just tried to go around the scene and observe the details. So I'm like, Aha, okay, this is interesting. It's just a black square on the wall. I don't know, I like it. For me, it's a nice image, maybe, and then maybe I will record this. Or I will wander around observe the details of the texture or the things on the wall. In this insights of encounter I, I started find shadows really interesting. So I would often look at the shadows and some of the they would use. And, you know, I just give myself time to have a scene and just look at it as it's an image or as it is a painting. And then I will just observe it for, you know, until I'm completely absorbed in it. And then after a while, you will really learn that this space is alive, because this is not animation, I haven't. I'm not controlling everything. There are always some subtleties that are changing. And I need to understand what, you know, how is this space breathing, let's say and how can I breathe with this space. And then I have put some particle systems a very important thing in Unity particle systems is like an atmosphere, or the sea or the ocean can be a particle system, the wind, the fog, the dust, or the birds can also be particle system. These are things that are not really animations, they're more like simulations. And when I, I had this fog and dust thing, and I just, it was my decision to have it orange. But once when I was in the scene, I started, I was just here, I was looking at the scene, I was like, Whoa, what is happening. And I was fascinating how this atmosphere is basically eating up the architecture. And this wasn't my intention at all. I wanted to work and deal with the topics of architecture and gaming. But the project started to take me somewhere else and started to be more and more abstract. And I was somehow seduced by this. And I started to follow this. So I just went into it. And and then there were some scenes in the video, maybe you have seen before, that are completely abstract. It's nothing. It's just a lot of these type of abstract flat screens, or just there's like a murmuring of this noise and sound. And this, you know, it took me maybe one year to come to this. And after this, I knew what is the project about what you know where I'm going with this project. So what I want to say cinematic techniques are when you are experimenting in unity, you don't have to really rely on the technical knowledge. You don't have to rely on the 3d models. You don't have to rely on sophisticated graphics. You can play a lot as a visual artist or you can think about this image making just just by going through it. So yeah, so this is the game mode right. Of course, I will try the bird's eye view. See how things look from above. And but with unity we also talk about At a real time filmmaking, what does this mean? I have the scene, I have put things together. Now I'm like looking how everything is working together. But I haven't some other ideas, for example. For example, here, I don't like this structure, maybe I, maybe the director has decided this, this structure is unnecessary. So usually it will take you maybe a week, days or months to change. Even if you're doing a 3d animation, it will take you a lot, you know, to do things with unity. All you have to do is leave the game and go into the edit mode. So what did I say I don't like this structure. This is the skeleton, I think, this one, okay, then I will just, I don't know, delete it. And I will go back into the game. And that's it. Now, I'm filming like that. And so let's see what I can do with this. Um, or, I remember when I was building this scene, the fog was really cool. It felt really, it had a really strong atmosphere, but I wanted something else, you know, to have it even stronger. So I added this. Flames to have you ever and with Unity, you can constantly work between the scratch, and the final product, which is fascinating. So you constantly have all of these things on the same plane. And to demonstrate this I have, I would like actually to this is just an example of work I did before. And to demonstrate this, I'll just try to bring back my skeleton so that I don't lost it. I don't lose it. Set analyser for the future. And so can you see now in a new scene in the Okay. Yeah. I would like to show you how to build a world from the scratch from nothing. And can you tell me Jamie, how much time we have more left? Or where are we with time?

**Jamin Warren** 1:07:33

Yeah, we have about an hour. Let's see here. Yeah, we've actually a bit longer because we're running actually running a bit actually running a bit early for this section this section we have Okay, so we had for this section we had setting a scene, working with 3d models and then compositing from like now from seven to or I guess your time, yeah, it would be 7pm to 7:20pm roughly and then after working with the camera for like 720 fun,

**Mario Mu** 1:08:15

okay, good, good, good, good. So, we will have a recorded version available later and you can go through everything step by step, I would like to show you how a project looks from the scratch. So this is a 3d project with high definition render pipeline in unity. And I have nothing, I have the void, and I have the sky. So and there is sun somewhere, it's over there. So that's it, this is this is how you start with every Unity project you have nothing. So um first thing I would like to mention is how to navigate through this space which is quite important. Let's see if everything works well. Okay. So, the mouse is quite important to have three buttons. You are choosing you are picking objects by left click. This is one object that I have selected and you are using your right button to move around the space. So we are moving around and you are using the scroll button to zoom in And to zoom out. So moving around with your right button and scrolling to zoom in and zoom out, but there is another feature. First, I would like to bring in one 3d object into the scene, and I will bring in the plane. So I will go into on the left side, there is a list with all the elements that are in the scene, I will click the right button. And I will choose 3d object plane. So now I have the plane in the seat I will find my plane here. And I will use this section here to move the plane around. But I don't see it, because it's tiny. So I have to locate it. And there is one really nice shortcut that you can always use. And if you hold, Shift, and F together, it will always bring you back to the selected items. For example, if you lose yourself, and you don't know where things are, like in this situation, and this happens a lot, you just have to select the item in the list, and press shift and F and brings you back to your seat. Now, in this upper left corner, I have the move section when I'm holding these arrows x y Zed I am moving my item below that is the rotate. So I can rotate things in all different directions and I can scale things. So this is what Jamin has said this is the question of the scale and creating different scale we are bringing in the sense of space. So this is the plane. Now what I can do is take some models into this scene, I have some models that I have created with the 3d modeling software. And in this workshop, I really want you to focus on very bare minimum, because these are all the basic principles that can apply to maximum level of sophistication and complexities. Today, we will just work with very simple shapes and some simple colors. And in the second chapter, I will show you more about physics and rigidbody. But let's do it step by step. So I will bring in some models into the scene randomly. And the model section is below in the assets. Here you can drag and drop any type of game asset you have, for example, you have it on the desktop, you just drag and drop it here. And this is your folder section. Here I have all the objects and I have some material, which are just basic colors. And I have somebody Meishan and later I will show you how to apply animation to the object. But let's find my objects so I don't see anything. So press Shift F and it brings me to the first object that I brought into the scene. And I will start slowly to arrange things that's how I actually work. So things are randomly set in the space. And first thing is to try to somehow put them in in some kind of a relation. So the first my first basic instinct is just to bring them together this is like if you Go for a walk on the beach. So where is my? I have four objects, I need one. Where is it one? There it is, it is as if you are going for a walk in the beach and you'll find some interesting stuff, you go back home and you're putting it on the shelf. So that's what what did I find. So I have some arch like Arch, I have like one stone or something, let's rotate this thing, okay, I have this, I don't know how to describe this. And I have like a little star shell. So assembling things together and putting them in relation is the, I guess the basic impulse. And the next stage would be to give them scale. And by giving them scale, it will give them a sense of space. So let's say that this arch that this is really like an arch. So I will scale this up. And I have this object, so maybe I will rotate it, let's see. And I would like to put it on top of the this one. So I'm using my mouse, and I'm using keyboard, if you you have just like in games, W A as the buttons. So if you press the right click on the mouse, hold it. And when you are, you can walk around WASD just like you're walking through a game to any kind of first person shooter game, or you can fly around. So you can constantly have all different perspectives. So and as I said, I started to grow my sculpture component, I started to create a sense of space. So there is this object standing on top of this object. And I could use this one, too, I will scale it even more massive, and this will be my mountains I'm moving things around. And now I want to put myself in the position of observer I want to be, you know, try to figure out what is happening here. So if I start a game, here, I see some kind of a wall or if I look upwards, it might be a mountain or a hill. I can obviously leave the space here, but it's some kind of a space like and there is this must have some kind, this must be a place of historical significance, this arch and the little sculpture. So this must be something that I have to observe more in detail. And the role of architecture in video games is actually to navigate you through a certain experience. Let's say that I started the game. And the game creators wanted me to start here. So this is where I start the game. You know, you press the play and you are here. You walk around what is this? I have no idea. So you have to move. Explore the space. And obviously, architecture here is to lead you through a certain experience and just with a very simple solution of putting you're completely behind this model. You are completely engaged and then you are thrilled when you find an entrance. This is like the moment of discovery. And then you're oh wow there is something here. So So let's say this is my first. As far as discovery of space, now I will go back into my assets, and I will choose the material. And I've tried to give more life to the scene. So everything in unity is drag and drop. And or so much of that is so I will take, pick a material that I like, these are all materials. As I said, I'm using basic colors. But this could be a material of a stone, or a material of a tree or a material of concrete floor, and so on. But today we are using just basics. So I'll put the note, let's say I'll put some orange here. And I will start to paint this section like this. So now, the space space has now some kind of, you know, some kind of a character. And now we can start to talk about world building. Now we're, this, this feels like some kind of a world where its own intrinsic principles. Everything is kind of rounded here. And we have pretty much one world that exists. I will now delete these things. So we still have the plane, and I will bring you to the scene that I already made. So I will use my gravity, shortcut Shift F. And it's pretty much the same thing. So I have one object that has the role of like an arch. And there is something on the floor. There are some things here. And I'm putting myself in the role of observer, and I'm trying, I'm navigating. I'm looking at the details. And then I'm now Okay, what if I, I don't know, change this little bit, maybe scale it up, maybe. But as I mentioned before, the real time filmmaking just means that you're constantly able to change things. You are constantly experimenting with the process. And so let's call this a finished situation. And I would like to shift your focus a little bit to the Unity interface. So on the left side, you always have the list of things that are in the scene, we have the sun, which is defining the properties of lightning, the sky and fog volume or defining the atmosphere. The plane is the 3d model that I brought into the scene. And we have these models here. And this is our our hive are just folders with things that are available to us. And on your if you click on some of the objects, let's say if you click on this object, and on your right side, I can just give you a full overview. There are so many details about this model, for example, this the size, the scale the properties of the 3d model, mesh, materials lightning. Let's see this feature. I can take this object. So this object here, and maybe maybe I don't like the shadow but I don't Want to change the properties of the whole scene, I don't want to change shadows for everything I just want. I don't know, I just don't like the shadow. So, I will select the object and in the lightning in the cast shadows option, I will just say off and then there is no shadow here. This means that I can treat the scene as it is an image. So I can constantly paint things. And the material is this thing here. So, in materials, I can define enormous amount of things, if the material is transparent, if it's glossy, if it's metal, what type of color and so, let's say that I want to have a different color, I want to have like a blue color here. So, in my acid section, I will press the right button. And I will go into create and in create, I will I have many options, and I will choose material. Let's call this material eight. And I will click on it and in the surface inputs, I will click on the Color section and I will find a blue color a blue shade that could fit into this There you go. So, now I will apply a blue color here or maybe even here and in I have changed the look. Or I will say maybe it has to be more dramatic, everything has to be red, and with the black floor. And I will put this also. So if I think I missed something, I would go into Window. And I would go into Asset Store. And by clicking on asset store, I am brought into one of the biggest archives of game assets that exist. So I can in the Unity Asset Store, I can basically look for anything for example, the clouds, or the cane characters or different cameras. And there are many, many, there are many, many free acids that you can just quickly incorporate so you know I could in just a couple of minutes, I could take this scene into my into my game and start working with it. So also dimension there are many 3d model archives available on internet you can just google and you will find so much of it. And of course you can 3d model things on your own. There is also a process of photogrammetry a process of photogrammetry is using images to create 3d models and the photogrammetry technology today is also quite accessible and very easy to use. So if I grow into 3d, let's say I can choose you know how much money like I want the free assets or there I can also look for something I don't know maybe I need anime character and then you know I can find some kind of anime character that I like or I don't know I need a football. Football And then various footballs available but I need to say football model architecture so from the interior to the exterior and so the possibilities are infinite to go back into my scene we are now creating a 3d environment. So we have created some kind of a sense of space, but we still don't have things happening. I have mentioned before animations, rigid bodies and colliders. So Unity has this capacity to simulate physics. So to simulate gravity simulate wind to simulate also sorts of weather conditions and in this in this workshop, I would like to just show you a little bit about rigid bodies and collisions, which just means that we can incorporate we can bring our models into a unity physics system. And with collisions, we are just telling how things are interacting one with another. So, for this purpose I have a scene to I have some models also here. And if I select some of them, like this one, I will see the rigid body the rigid body the mass is 100. So, it's pretty heavy, and gravity applies to it. And the capsule collider, the collider section just is here to tell me that this item will interact with other items. But this, this other item has only the mass of one. So if this one has 100 and this one has one, it's most probably that they will behave differently. So when they're falling from the sky, the one that has mass of 100, they'll probably fall faster. And the same applies to the things that are on the floor. Now, let's put things back through original. And there is one thing I would like to show you also, it's how you can group things together. So if you choose a number of elements that somehow have a characteristic of a group, you can create empty and call it I don't know Object Object x, and then you can drag and drop all of those elements under that game object and now they're all acting like one. So, all the changes applied to the whole group. And I would say that when creating the environment, we have now reached a point where we would like to actually record the situation. So I will walk around the space. See how things look like try to imagine myself as a I am a player. Maybe I'm coming from here I will observe the shadows and now I need my game engine to work but if I press if I press play, I won't be able too, to play the game because I don't have any cameras. So I need to leave the game mode. and bring in some cameras into the scene I will go into the list into the hierarchy press the right button and select a camera I will call this camera one. And if I press on this camera in my lower right corner, I see a camera preview I can move the camera around just like I'm moving the other objects and if I go to the section on the right side of the inspector I can change many variables variables of the camera for example the field of view or clipping planes which defines how many how far your camera can see if I click on the physical camera I can also simulate the existing physical cameras like eight millimeter camera or 16 millimeter camera I can define the light sensitivity the focal length or the filters like the color filter so I will maybe this is a good start so now I'm going into the game mode. And now I can see finally, what's happening in the scene. So the gravity is has applied to the objects and there is a total chaos. So my first reaction is you know, I have to react to this chaos somehow I don't understand anything so I'll go back into my camera and maybe try to see things from a better position maybe from here so let's press play again so Okay, now I have some better understanding of the situation the big things are falling and I'm trying to observe what is happening I haven't predicted much of the situation so I see some elements including the wiper this one is staying here it's quite dull it says my internet connection is unstable Jamin Can you still hear hear me? Yes. Okay. Okay, okay, so let's bring in another camera let's scroll this camera to and maybe try to put this camera more into the into the actual scene like this so now I have to select this second camera and I need to deselect the first camera because you can only play a game with one camera selected so let's see what happens from the other perspective okay now I'm starting to get have a sense of the whole situation so I can start to think about you know what, what would be interesting position here and I want to have a new camera it's we will call this camera three and let's Let's bring this camera behind the arch maybe like this maybe something like this Now I'm curious to see what will happen from this perspective Okay, but what I have now I have a some kind of a cinematic insight for the first time and let's say I like this scene so I will leave this camera and I would like to work more on some other details for example, this is the feedback. So one thing I have learned definitely is that this thing here the way it reacts is quite weird. So I would like to see if it can go even more weird I will just press last two and what else can I do maybe I can scale it and put it like you know change the rotation it's so let's see I will now this select previous camera and select again the first camera that had this decent view where we can see everything from the first from the front so let's see what happens okay okay, yeah now I don't understand what is happening with this yellow thing. What is this? Maybe I'll just delete it Let's see this. Let's say this again Okay, so let's just say that we will we can try this for weeks and change things until we find something interesting. We it's not about what do we want to see it's more about you know experimenting and seeing what happens for example I will play this game for several times too and then figure out okay, I like this I like this black item here maybe I should just focus on this completely so maybe maybe I can anticipate the that that situation and Okay, when it's coming somewhere here and field of view, like this. So I will this select this camera and I want to just wait until that object appears in my in my camera view and now I have a completely different situation. And and and there it is. As so, and it's quite weird. And for me I know I've come somewhere I know I can stop experimenting when I have a feeling that there is event there is like some kind of a sense of that something really is happening like it has its own agency. He just a weird moment. So I like this situation and I would like to record it. I would like to document this. This situation and maybe even better, maybe you know just from the visual visuals side I would like to make things much more dramatic so I would put the ground read and I don't know maybe I will rotate this differently like this let's say so let's go into recording we have 1234 cameras and if we go into Window we have covered the Asset Store and there is also the package manager and the package manager will give us the registry of the unity assets here you can find a so much for game making and also cinematic tools I would definitely recommend the cinematic studio and cinema machine. But you know, we would need another workshop or another time just to cover the full cinematic studio that includes cinema machine and it's absolutely fascinating and complex set of things you can do with you know with create films and other animated linear content what I am looking for in my unity registry is the recorder it's here and then I need to install the recorder which I already have. So once when it's installed I'll go back to window I'll go into general and under recorder I will choose recorded video so now I have a movie section where I can define the source is the game view the quality let's say 10 ADP aspect ratio 69 media file format the file name where it's going to be recorded and so on. Here under the Add recorder section I can add you know if I want to make an image sequence or I can just record audio or a movie in this case it will be the movie so once when my recording features are defined I can see with what kind of with what camera I want to shoot let's see okay okay, I will just make recordings with all of these cameras and see what I get so let's start recording with the camera number one let me show you this so here you can see how many frames it's processed it's 600 it's more than enough let's in order to exit the play mode we need to change the camera so I will now select the camera number two and I will record with the camera number two so now I will repeat the process with every camera I have to deselect this. Make sure is this selected camera number three And the final camera number four so that's it, I made recordings with all four cameras and I want to see the results. So I will start my video player and I will go into the folder this is the unity folder and under recordings, I should expect my recorded material. So it's here and I will I would like to see what we did so let's see. So I have, let's say, from what I see here, I'm not satisfied with anything, I don't like the color of the of the floor. It's not giving me an impression of anything. So maybe do this. And maybe I also need to make the scene more interesting. So I will look duplicate one of these one of the elements like the big one, and just well maybe there's something like this all and oh, yeah, and this little object. So I would, I would say that this object is very important, I will paint it, orange. And I can give it agency. So all of these things are, all of these items are behaving according to the unity physics system. And I can animate this thing, so it's just moving the way I want. So I made some animations in advance, I can apply just by these are the animations. It has the simple timeline. So in every frame, I have just changed the rotation of the thing. So if I take the animation clip, I can apply it to this object with see its object number six, and if I go into the right side, I should see my animation applied. There it is, it's animated. So I will have a camera dedicated just for this object. This will be the camera five. Maybe something like this, and a field of we can change the field of view to bring it even more closer like this I think this will be good. So let's try and see what our camera five is catching so what we have here is one object that he just wrote the eating. So, of course, animations are also a complex set of things. I want to show you the basic principles but this orange thing could be a human figure and then I could just apply an animation and say, Okay, this human is dancing in the scene or it's screaming or it's running. I could apply I could take the model of animal and just say okay, this animal is running around the scene just by applying the animation and in the asset store you can also find a lot of pre made animations for which you have to have a really good read buddies and skeletons for the 3d models and yeah, now I would like to make the final recordings so this one is okay. This one is a bit boring. What can we do maybe something like this Oh, this is cool let's see what's happening with camera three. This one was interesting. Camera for camera voice following. Okay, I have everything. Now I will do my final recordings for today and I will have to sleep one night and tomorrow I will look again at these recordings and see where can I take it and then depends on how long I'm working on it. We can go from here to who knows where but let's see that in about one year. For now, I will just do recordings in this case, I'm using the shortcut if you press the F then there's the quick recording shortcut so you don't have to do things manually every time you have to leave the game mode and then deselect the camera and select the camera you want press F then which is a quick recording shortcut

1:58:14

okay

**Mario Mu** 1:58:24

let's see what camera three can do I'm switching now to camera for pressing F 10 And the last Camera Camera number five so now the recording session is finished and I Want to know I want to see how this looks like see? Okay, that's I'm actually quite happy with results I think we got you know from nothing into something quite quickly and I have now so much more ideas what what can be done here tomorrow I would watch things again and then see okay I would change probably something with this more and then I would be bring I would bring more elements once I have all the recordings it is just a matter of bringing them into the video editor. For example, you can use you know, the Final Cut or Adobe Premiere or DaVinci Resolve and start to do what Sergei Eisenstein has said that videos are all that film is time based medium. So you will take the clips and start to play with a sense of time, you will maybe show just two seconds of this clip, then cut and go into this thing. And then cut and then show this. And then you are creating a dramatic moments or you can just have things on loop. And slowly you are entering, you know, the realm of cinema. And what I have mentioned before the fascinating thing with Unity game engine is that you can constantly work from the source from the scratch to the final end. So you have the recordings already and I don't know maybe you are showing them in one year or tomorrow. And you have you already have the final result. And then you can constantly go back and, you know, tweak things, try new things. We could slow down the scenes or speed up, we can color grades then turn everything into green. Let's just show for the end how can we change the atmosphere of the scene very quickly. So if I have the sun in the sky element, and if I go into the emission and I could let's go like here I could quickly change the situation from the dusk to dawn or from the night seeing into the middle of the day or I can make things very dramatic. And say that you know I wonder how things look like under a completely red light So immediately we have a completely different video let's see how this looks like with with this camera. It doesn't look, it doesn't look, because we still have this camera selected. So let's try again Yeah. Okay. So this means that the scene has crashed, we have reduced the amount of experimental ideas for today, I would say. So, I don't know about you Jamin. But I would finish with with this.

**Jamin Warren** 2:05:41

Lovely, dark. Do you have any questions for Mario before we break for today?

2:05:48

I mean, I have a lot of questions. But yeah. It's a really, really good process. I mean, yeah, it's really interesting to start from nothing, and then in the end up in something, and yeah.

**Mario Mu** 2:06:09

Do you have? Do we have any questions that you think would be important today? Maybe even for other people who would watch this later? Is there something that is confusing you? Or do you have a specific question on the call process?

2:06:34

Not anything in particular that I can think of at the moment, I mean, I'm really curious of how how, working with be not even recording, but like animation, or just like physics with, with more complex objects and structures. Because this is quite simple. In a way, it's really interesting to see how the material itself of the software kind of generates, like, the movement generates the atmosphere. And but I'm really curious to kind of see or find out how, how it looks like. Because in your video that you've that you've shown in the trailer, you can like water trees, and so much more complex kind of environment? And, yeah, maybe not really a question, but just a commentary on.

**Mario Mu** 2:07:41

So, you know, for that, you just have to have a stronger computer. And very quickly, instead of these objects that we see here, we could put way more complex things like human hyperreal, human or architecture of the cities, the lightning, and so on, we could quickly instead of these, just by clicking on them and saying source this model, instead of this model, we could have horses falling from the sky, or we could have, yeah, you name it. We could have rain, we could have wind very quickly, I wanted to just show you the basic principles, and then it's the table, it's really not the problem with complexities, it's not a problem as long as you have money. And I would definitely recommend to everyone to reduce as much as possible in the beginning, when you are starting to learn unity to to work with reduce components, and then slowly you can bring in more and more complexities. But if you don't get your hands really on the basic principles, you get stuck into the labyrinth of quite complex things. And you will see that you don't come much too much results. So, but you know, where the sites have encountered the example I've showed before, this the principle is basically the same, I would bring in the models, which are high definition models. And then I would bring in the physics just like I did here and I brought some fog and fire inside and I press play and that's it. So it's it's just a different setup and a completely different universe. But the basic principles are very much the same.

2:09:47

Maybe maybe one question like how is this done translated? I mean, okay, the kind of setting up like the scene recording process. This is quite, I would say straightforward. But how can you transfer this, for example into a game? Like if I want to do if I want to do is within a game do I need to? Like, I mean, if I'm a character in the game, and then I want to interact, for example, with the objects, then is it like a completely different way of programming? Or is it like more people are working within the same project? Or to kind of re predict everything that might have happened? Or, or to predict all the relations that the character might have been one of the subjects or how we record it? And how is it then? Yeah,

**Mario Mu** 2:10:53

I would say that the making game single handedly, so one person making the whole game is a heroic act. And you have to have a very vast set of skills in order to make your own game. And there are people who are making their own games, then depends on the complexity of the game. There are games like Stardew Valley, that are made by just one person, or Minecraft also was originally made by just one person. Or what was the name underworld, for example. But this takes a lot of dedication and learning so many skills, what I said in the beginning, you would need to learn how to code. If you want to make sure you've got your own game, it would be quite helpful. You have C sharp and C++ depends on which game engine you would like to use. But there is no but really, it's, it's all about learning the basic principles. And then on top of this, you can go into more complex situations. If you want to have like more game characters around, then you would need to learn more about rakes and you know how the skeleton the backbone of the character works. So when you are applying animations, or when you are working with interactions, how things work together, you would have to learn more about camera work. So this, what I have demonstrated today is a very, very simple camera work. You can you can, for example, have this camera and say okay, every time my character approaches this object, the camera will start to circle around the character. And only to do this you need to you know, sit and write quite a long set of definitions, you can say, every time the objects are falling, this object will become green. And your game character for that reason will die if it's close to this object. Or you can and then you can go into more and more complexities you can say and every time the character dies 700,000 Horses falls from the sky. And for all of these purposes, you need to learn more about game mechanics, the the logics of the game, which is very much a logic of coding when something then something if something then this, this plus this minus that. So it's very much conditional. And, you know, it's all about practice. As I said, there are some templates you can use in unity and in and unreal. So you can go in one of the gaming engines to just choose the template for example, first person shooter template and you have immediately a Counter Strike type of game or Call of Duty type of a game. And then, you know, you can define what kind of character you like, what type of environment but pretty much the game mechanics are based in the same Principles. Also, you know, the whole, the whole process of working in another workshop would be just work with the cameras. Today, I wanted to give you the full overview of the process from beginning to end with as much elements as possible. But to keep it simple, and then in every step of these we can grow. You know, for a long time, we can talk about lightning, just in one workshop, we can talk about, you know, we can talk about just working with models, I could show you how to model things in Blender, or how to work with photogrammetry. So everything can go into complexities. Therefore, game making is a heroic act. And it's definitely something that it's done, mostly collaborative collaboratively. So, so everyone kind of specializes into something. And from this perspective, I will say that in my practice, I have specialized on creating digital environments on level design and on cinematic techniques in game engines. And if I would participate in a game production, that's what I would do, because I have nothing. I don't know how to code or, you know. And so what

2:16:36

do you think? Thank you.

**Jamin Warren** 2:16:39

Lovely. Well, thank you, Mario, for leading us through this. For folks who are not here. Please feel free to go back to this recording as much as you feel feel fit at as much as you see fit. And of course, we'll be looking to do more, more stuff at the intersection of like cinema and gaming in the future. Mario, thank you so much for leading us through this it was it was delightful.

**Mario Mu** 2:17:06

Thank you, Jamie for inviting me and thank you Darko for being the best, buddy. Our best question, questioning partner