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05 - 04 - Vision Accessibility

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STEVEN SAYLOR: Hello. This is the visual, blind or low-vision accessibility guidelines for this particular module. Now, this one, actually, we're going to be going a little bit more in detail, especially within The Last of Us Part II because there's a lot to show. And actually, The Last of Us Part II probably has the most that's been done for blind and low-vision users in any game. There is a lot that is here that fills the spectrum of blind and low-vision. So I won't be able to go through everything, but essentially, I want to be able to kind of just point out some cool highlights that essentially are not necessarily in the basic guidelines that we will recommend for visual or low... basically, for blind or low-vision disability. But essentially, it just kind of adds a quality of life to those players in a really, really cool way. So the first one I want to be able to talk about is ensuring no essential

information is conveyed by a fixed colour alone. Colours are useful means of communicating with well-established meanings. However, they are lost on people who can't distinguish between certain colours. Whenever you can, use a colour as a backup for another means of communicating the information, such as text or a symbol, pattern, or shape. This could be by default, with the extra reinforcement often benefitting all players, or via a setting. Some colours also appear darker than without colour deficiency, most commonly red, so check using a simulator for foreground-slash-background contrast too. When I talk about a simulator, there are actually simulators you can be able to even use, not just for web, but also for video games as well, that will actually be able to simulate what kind of... what sort of type of colour blindness that you want to be able to sort of design around. So, for instance, if we use... If we go into The Last of Us Part II, I'll show you here. If you go into the accessibility menu, and then you go into Magnification and Visual Aids. Now, there's a few things that are here, but we're going to take a look at, essentially, the HUD colour as an option. So right now, it's sort of default set to white. But if you find that, essentially, white is a

little bit a difficult colour to be able to see or look at, you can be able to change the colours, and they do have a few colour options that are here. White, yellow, blue, red, or green. And this will allow you to... This changes pretty much all of the in-menu items. Not only just the in-menu within the options, but within the in-game menu as well. So, for instance, if we set this to yellow, and then if I go into the game itself, if I had my camera here... You can actually see that the HUD on the bottom right corner, where it shows how much ammo I have, how much health I have left, has also changed to yellow. But if I go into the in-game menu, which is generally the crafting menu, and that's by hitting the touchpad... Actually, sorry, I just accidentally zoomed in here. You can actually be able to see that this also, that colour change also affected this menu as well. And then it also changes the highlighted colour as well, kind of gives it a little bit more of a red. So if I go into the options again, and go to Accessibility, Magnification and Visual Aids, and I change that to say blue, and then I go back out to the game, it actually will... (indiscernible) It will still keep the highlighted colour the same, but it will actually change the text as well. So that is one particular option.

Now, another option for colour blindness in The Last of Us Part II, if I go back into Options, Accessibility, Magnification and Visual Aids, you also do have the ability to change the HUD colour-blind mode. This changes the colour palette of HUD accents. So, remember I mentioned the specific colours for the highlight colour can stay as red, whereas the text stay as whatever colour you set in the HUD colour. This is where you can go into the specific colour-blindness that you may have. So whether it's protanopia, deuteranopia, or tritanopia, you can see how the colours have changed, and it gives you examples of what the colours will look like. So actually, what I'll do is I'll show you the more visual kind of look to it, or at least the one that will show the best scenario of what actual colours it changes. So I'm going to use the tritanopia colour blindness. So, if you can see, the colours have changed for that. But if you go into now the in-game menu, you can see that the highlighted text and the highlights around particular items that are needed in the game, essentially, are now sort of a shade of purple. Again, this does... For those who do tritanopia, this actually will just make, essentially, that colour stand out a little bit more to them so it's not blended in with

the colour text that is there. So that actually helps out them quite a bit. Another option that is actually in the colour blindness is also in regards to high-contrast. I'll talk about high contrast in a second, but I'll only focus on the colour aspect of it for here, right now. But essentially, the default setting for high-contrast mode is blue and red, that kind of colour. But you can be able to adjust the colour setting of that as well. So one of the settings is, you can be able to turn off the red, just so it has a little bit more of a beige colour. You can also set it so that, again, there's a little bit more of a greener colour. So this actually is really great for those with colour blindness. If you need high-contrast mode, you can be able to adjust that as well. So now, moving on to the next point here, you can be able to... If the game uses a field-of-view, a 3D engine, generally, only... So this is not for any title like a 2D platformer or anything like that, or just has only one particular field of view. You can set an appropriate default for the expected viewing environment. Field of view is a simulated viewing angle through the camera, i.e., perspective. Every 3D game has a field of view angle. If the field of view is significantly different to what the eye-slash-brain expects to see, it can result in

motion sickness. This can be extreme, resulting in nausea and disorientation strong enough that play duration in excess of a few minutes can become impossible. An appropriate viewing angle is usually 60 degrees for TV, 90 degrees for a monitor. Now, in this particular case, kind of explaining what field of view is in a better way, essentially, is that, essentially, the camera view... Actually, let me go back to my own... So the best way to be able to actually kind of describe field of view or FOV in a game is that, essentially, it is the view that is shown in the screen itself. So think about it as kind of like an angle coming from your eyes that essentially kind of branch out. The more field of view you have, the more you can be able to see on the screen so that nothing can be able to be... that is off screen... Like, you can see a little more of a distance of. If you narrow that field of view, it sort of eliminates sort of what is... like, what the player can actually see within that field of vision. Basically, that cone goes a little bit smaller. If you have that field of view narrow, and you're having to move around a lot, that can actually cause a lot of motion sickness because, essentially, there is too much information that is being presented. Whereas if you're able to expand that field of

view, and you're having to be able to move around, that field of view doesn't really cause a lot of motion. So, essentially, that actually can help those with motion sickness, or essentially have a cognitive or visual disability where that can be a little bit too... Like, it can be a little bit too much noise or complexity if you expand that field of view. So, for instance, actually, if we go into The Last of Us here, there actually is an FOV slider. That's how they nickname it within the video game industry. It's an FOV, which does stand for field of view. So, actually, if you go into the motion sickness option here in the accessibility menu, you can actually see Field of View is an option here. Now, in The Last of Us, it actually sets it to a zero. Generally, FOV in PC games, you kind of would see, in regards to a scale in regards to 100, 75 to 90 is sort of like the default FOV in most games. But in games that are on PC or in a game that actually offers this kind of FOV option, you can go up past 100 to help add that FOV angle or expand that FOV angle. So I'm going to show you, actually, this is what the default looks like, the default field of view in a game. So, actually, if I turn off... This is in high-contrast mode, but again, I'll show that in a minute. (indiscernible) Oh, I'm actually zoomed in.

Sorry. There we go. Now I've turned it off. So you can see the edges of the screen right now, based on where I'm looking, you can see a little bit of the bookshelf that is off to the left side, and sort of this particular area off to the right. So this is the current default field of view. If I go into the Field of View option here in Motion Sickness, and say if I set that down to its narrowest view, which actually goes, in this game, is to a factor of minus five. So if I go into that and I go back into the game, you can actually see that that actually narrows down that field of view even further so that, essentially, now you can... You can be able to see that's a little bit... You have to move the camera quite a bit in order to be able to see everything that is in this field of view, and it just narrows that even further. So if I go back into it again and actually go into the highest setting, which is by a factor of plus five, and I go back into the game, you can see a lot more of the game itself. Again, this doesn't really increase it a huge amount in regards to, say, if you're talking about PC, like first-person shooter kind of games. But essentially, you do see that the camera has now expanded beyond just the initial edges of the screen. So that is in regards to field of view. This is actually... I actually find this setting

really, really great for games in like a first-person shooter, or any sort of shooter type game, and you don't want to be bombarded with any enemies that are off to the side. All of a sudden, if they come at you, then you can be able to still... You should be able to still see them if you have a wide field of view. If you have a narrow one, then the enemy will get even closer to you before you can actually be able to see it, and they may... Like, that actually may cause you to die if you weren't able to see that because they weren't in your actual field of view. The next option I want to be able to talk about is in regards to use an easily readable default font size. Small text is a very common complaint amongst people with vision impairments, whether medical, such as long-sightedness, or situational, such as small mobile screen or living room that does not physically allow for a large TV close to a couch. As players have a wide range of abilities and preferences and viewing environments, allowing a choice of font size is the ideal solution. But if this is not possible, setting a large default size is a good first step. Amazon TV actually has a 10-foot UI guidelines that include text size recommendations of 28 pixels minimum when viewed on a 1080p screen. When viewed on an

average size screen, this tallies for what would be expected for someone with 20/20 vision while using the Snellen chart, which is kind of the eye chart that you see in most doctors' offices, or eye doctors' offices, or optometrists' offices. However, because it does not take any degree of vision impairment into account, use of 28 pixels is a minimum rather than a target. Aim to exceed it whenever possible. So this is something that actually has been plaguing the accessibility community for quite a while, is that because there is a lot of games that have really small text, and really small default text size. This not only has been affecting those with visual disabilities, but also people without a disability, and they're finding that they... Like, they're sitting in a normal living room setup, where a couch is six to 10 feet away from the TV, and they actually... I've actually had some of my friends complain about the text size in most games that have come out, even recently. So we're trying to push for that. That would probably... In regards to visual disability, or at least low vision, that is probably the biggest issue, is in regards to text size. Now, actually, if you look at The Last of Us Part II, the text size, the default text size, pretty much, is in all menus. I think the smallest text size

that I've seen is actually here. If you go to Restart Checkpoint, you see here that it says, "Less than one minute," or, in Restart Encounter, three minutes. That is the default size that I've seen. It doesn't convey the most important information, which is what it shows here, Restart Encounter. But even the default size, that is probably the smallest I've seen in this game in and of itself. You generally would want to be able to have whatever the default size is to make sure that is a decent size. And again, 28 pixels minimum is kind of where I would say would be the best bet for any type of UI that includes text. You can actually be able to adjust this a little bit in The Last of Us Part II. So if we go into Accessibility, Magnification and Visual Aids, you can actually be able to see the HUD scale. You can either set it to default or to large. And you can see in this preview we're in here, you can see the default will sort of show the little HUD in the bottom corner. If you set it to... Like, this kind of just shows it as a visual example. The default the makes the little HUD icon smaller, but if you set it to large, it actually does make it a little bit larger, and this affects, actually, all button prompts and anything in the game itself. So, actually, I'm going to show you what it looks like.

This not only affects just the little sort of visual icon of how many bullets and how much health you have left, but this also actually does affect in-game button prompts, but also the in-game menu as well. So if I keep it at the HUD scale of default, and I can show you within the game itself. So if I turn off my camera, you can be able to see the bottom right-hand corner is where the... how many bullets I have left and how much health I have left. But if I go into the in-game menu, you can actually be able to see that the text size is... That is the default font size. Not the greatest option, I will admit, even as a default sort of look in the game. So I would even say that... Actually, I would love to have been able to see The Last of Us actually increase this to a little bit larger as a default size. However, The Last of Us does offer an option for a larger HUD. So if you go back into the options. Go back... Actually, I'm going to exit out of this menu so I can show you itself. So if I go back into Accessibility, Magnification and Visual Aids, and I set this to large, and I go back into the game, you can see that now the little visual indication in the bottom corner of the HUD, which just shows how much ammo I have left and how much health I have left, is obviously larger. Now, if I go into the in-

game menu, you can see that the text size has actually increased and made it a little bit larger for me to be able to see a little bit easier. So, generally, I would always look for this kind of an option in a game. But this, for me, would be a perfect default font size for myself. But I can understand where The Last of Us was going with it, so at least that is an option in the game itself. So, again, I generally would recommend, pretty much if you're designing anything when it comes to UI, comes to the menu, comes to the HUD, having a larger font size or giving the player the ability to adjust that size would be best. That's something I think that The Last of Us didn't do in regards to text size is the ability to be able to increase or decrease the font size as needed. I can understand why, sometimes, that then can cause some UI bugs that would have to sort of to be fixed throughout the entire game, but it's something that I generally would prefer in a game, is to be able to... have the ability to be able to adjust the size of that text however I see fit, or whatever makes it comfortable for and easier for me to be able to see. Having that large ability in there for The Last of Us II is great, but if you want to go a step further, giving the player a slider or a little bit more options for text size

would be great as well. Then one I want to be able to talk about is the use of simple, clear text formatting. So this ties into text, but I want to touch on this a little bit briefly. I did touch on it a little bit, but I want to talk about it again. For short passages of text, just an easy-to-read font over an unfussy background makes a big difference to readability. Ideally, a clean, sans-serif font with distinct letter shapes. Example, no mirroring between the letters P, D, P, and Q. And prominent ascenders and descenders, which is essentially the... sort of when you're looking at text in all caps or sort of a lowercase kind of setting with regards to text that has a "b" or a "p", the difference between that line for "b" or "p" go up or down... You don't want to be able to confuse a particular player with that particular font size. So, again, what this all kind of narrows down to is you want to have a very clear, readable font. I'll show The Last of Us here. As you can see, they use a sans-serif font pretty much throughout their entire user interface. This is great. This is generally what we prefer. Having a special kind of font, a stylized font that fits your game is okay, but you want to make sure that that is readable to a player. Generally, games such as... like, a fantasy-style game, they generally

go with a little bit more flowy, cursive kind of text. That can be really difficult to be able to read for any type of player, regardless of if you have a disability or not. So having an option to be able to change that font or just to adopt a default font that actually is readable would be great. Again, this actually even ties into those with dyslexia. Having a good, readable font that is generally sans-serif will work best than having, necessarily, a dyslexic font or a stylized text because, again... Because that only fits to a specific player. Especially if you have a dyslexic font, essentially... A dyslexic font is good, but only works for a person that has a particular dyslexia. That dyslexic font may not work, so you want to be able to have the option to have more of a sans-serif or at least a more readable font that can help for not just those with visual disabilities, but those with dyslexia as well. Another thing you want to be able to bring up for vision accessibility is provide high-contrast between text-slash-UI and background. After text size, contrast is one of the most common UI complaints. There are common vision impairments that specifically result in a loss of contrast sensitivity and others, such as colour blindness, that can be affected by contrast as well. Ensuring a good level of contrast also

benefits many other gamers who have situational impairments such as playing on a mobile device, in direct sunlight, or on a poor-quality display. Ideally, place your text and UI elements on a plain, high-contrast background or, where that is not possible, use prominent outlines and shadows to separate them from the background. The web industry has an established testable limit for what constitutes adequate contrast for screens which can be applied to games. Now, this is where I think The Last of Us actually really does shine, is in regards to high-contrast. I showed it a little bit when I talked about sort of the visual... sorry, for colour blindness, but I will show this off again. So if I go into Accessibility, and Magnification and Visual Aids, and I go into the High-Contrast Display, what this does is actually will sort of turn the background into sort of a greyscale, kind of muted colour around the entire background, and it will actually provide a contrasted colour for individual elements you can be able to interact with in the game. So, for instance, your character, as you can see here, is a blue character, or sort of highlighted blue. Enemies are highlighted red, and items you can pick up are highlighted as yellow. Now, I already showed, essentially, or showed what options you can

sort of set the high-contrast display for colour blindness, so you can adjust that, but I'm going to go with the default setting number one for this particular example. This, actually, to give it a little bit of background from Naughty Dog, this actually was enabled in Uncharted 4, which was Naughty Dog's previous game before The Last of Us Part II. It actually was called thief mode, and it was something that you unlocked at the... Once you completed the game, you could actually go into certain encounters and turn on thief mode, which would do pretty much the exact same thing as what The Last of Us does here. But a lot of people in the accessibility community actually pointed out to Naughty Dog that this is a really, really great option, and so they actually took that and ran with it, and actually added it in as a specific accessibility feature in the game. So it's not called thief mode. It is now called high-contrast display. So I'm going to show you how this works in the game itself. So what's cool about it is, actually in the game, you are able to... using the touchpad on the controller, you can be able to swipe left to turn it on, and swipe left again to turn it off. This is on by default, which is awesome. I really do love that that is an option that's there. So here, as you can

see, this is now the game in a high-contrast display. So again, you can see enemies that are now in red, you can see myself and allies are also highlighted in blue, and you can see that there's a bottle I can interact with that is highlighted as yellow. Some people actually have used this to be able to find specific items that you need in the game itself, which is kind of neat. Like it just shows that if you're looking for collectibles in the game, the high-contrast... At least in this game, when the high-contrast is turned on, the ability to see, "Oh, there's the item right there, with the highlighted yellow," actually can help sort of find collectibles that you may have missed. So again, this benefits those with not only just visual disability, but then anyone without a disability, they just want to be able to find specific collectibles as well. And also, what's really, really great, too, is also the... Again, like high-contrast display is in regards to every single aspect, including subtitles, having to be able to adjust the background of that. But also, if you go into Magnification and Visual Aids as well, you can see there is an option for HUD background. You can either set it to default, light, or darkened as well so it can help provide a little bit more extra contrast for the HUD itself as well. So I

sort of set it to darkened. That's kind of like my default. But this actually is something that is really, really great. I applaud Naughty Dog for being able to include this in here, because it made things a lot easier for me to be able to see in this game as well. Now, one thing... There are several things I do want to point out that are addition to... within the sort of visual disability guidelines is the ability to be able to include menu narration. Menu narration provides a lot of help for those with not only just who are completely sightless, but also those with a visual disability, because there are times where I'm playing a game, and my eyes are very fatigued, and if I have to read a lot of text, especially in an RPG setting in a menu, that's a lot of text to read, and that can be very problematic. So having a menu narration, or at least a narrator text-to-speech that can read out every single piece of text that is in the game, would be beneficial and helps alleve that I don't have to read that wall of text. I can have the game read it to me. This is really great. And also, again, this benefits those who are sightless, so that way, when they're navigating a menu or they're navigating the game or any text that pops up on screen, there is a narrator that will read that particular

text to the player as well. Actually, I'll show you how this sounds right here. So if I go down... So that's just within the menu itself. But if I go into the game and I actually go into the in-game menu...

(no audio)

So that actually is a really, really great way to not only provide menu narration, but also the order of operations for that particular narration, especially within a health kit or a crafting sort of menu. You want to be able to get the important information out right away. The health, like, what the title is, what it does, how much items you have to be able to craft, and stuff like that. Having that order of operations is key to provide that menu narration. And again, this game, pretty much every single piece of text that is in the game is readable with text-to-speech, and you can enable that by default before you even get into the game, which is really, really nice.

Another cool feature that I do want to show off in The Last of Us Part II is the ability to zoom by using the touchpad. So if I actually double-tap the touchpad on the controller... Actually, it's turning on right now. I can actually be able to, using the touchpad, I can now have zoomed into the screen, and I can actually move my cursor along any

area of the screen. So if I find that even if something... I find it really difficult to be able see anything, or even the large font size is a little difficult for me to see, I can be able to use zoom to actually zoom into... Pretty much makes this a really, really large text, so actually, I can read it without any eye strain at all. But also, as well, if I slide the touchpad here, I can actually be able to see... Oh, you can be able to see that in between... Like, in the background or sort of off in the distance, there is an enemy that's there that I would not have been able to see unless I was zoomed in. So if I actually zoom out, you can barely see that same enemy that's off in the distance. But if I zoom in again and I go to that spot, I can actually see. I see that a little bit more clearly. I actually wish that all games would enable this, to be honest, especially on PlayStation. The fact that the touchpad is there, this would be great. This would be awesome. I wish more games will have that. Hopefully in the future, we'll be able to use that. But this is a really, really amazing tool for accessibility purposes, and I kind of hope that other studios will enable it. The touchpad is a really, really great option to be able to include a zoom capability. So I really do hope that other studios will take notice of what The Last of Us II has

done and include that as well. And also, as well, there actually is an audio cue glossary. I do want to be able to show that off. So if I go into here.

NARRATOR: Interact audio cue. X button, interact audio cue. Distant. X button, interact audio cue. Hold. Circle button, crouch audio cue.

SAYLOR: So this audio cue glossary, this is actually really amazing for those who are completely sightless or whenever there is a button to be able to... like, a button prompt on screen, to be able to hit a specific button, like, in the game itself. And it uses a audio cue for each button that is in the game. So, for instance, if you go up to a rope in the game and you have to be able to push... Like, the game tells you you have to push X in order to be able to climb. If you have the audio cues turned on, if you go up to that rope, it'll play the audio cue to tell you, "Okay, you need to push X." Then it also will add a little sound effect for that rope to tell the player, "Okay, you need to be able to push X to climb this rope or interact with this rope." And that is amazing, sort of like... Not only for those who are completely sightless, but really amazing, even for myself, that it just helps me be able to play the game and see, like, okay, I need to be able to push X,

and I know that... Like, if it's really dark in the room, but I'm like if I... It's hard for me to be able to see that rope. Having that sound effect there, that precedes the audio cue, is amazing. And the fact also, as well, that you can access the audio cue glossary at any given point in the game just by hitting the options button, and it is in the options menu. So if you forget, okay, what button... Like, what audio cue is this button? You can go in and be able to hear it and then you'll be able to memorize what that audio cue is for those buttons. Amazing. Amazing, what The Last of Us II has done. You can actually see a lot of audio cue glossaries in fighting games as well. So for stuff like Mortal Kombat, there is an audio cue glossary that you can be able to know, that you can be able to memorize, essentially, that can actually allow you to know which sound effect is for which. That actually is kind of more built into the individual moves. You can hear the sound effect of those individual moves. Fighting games actually do use audio cues to a really, really cool effect. So those are just a few of the visual accessibility guidelines for those who are blind or low-vision. Again, if you want to look at more intermediate or advanced options you can add, you can be able to check out the

video game accessibility guidelines that'll be linked into the learning modules of this particular course. So if you want to check that out and go even further into how to include visual disability or accessibility into your game, you can be able to check that out as well. So that is it for the visual accessibility.

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