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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,
Petitioner,

v.

DIGIMEDIA TECH, LLC,
Patent Owner.

IPR2022-01182
Patent 6,473,532 B1

Record of Oral Hearing
Held Virtually: October 19, 2023

Before GEORGIANNA W. BRADEN, JOHN A. HUDALLA and MICHAEL T. CYGAN, *Administrative Patent Judges*.

APPEARANCES:

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The above-entitled matter came on for hearing on Thursday, October 19, 2023, commencing at 10:00 a.m., via video teleconference.

P R O C E E D I N G S

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JUDGE HUDALLA: Good morning, everyone. This is the Oral Hearing in IPR2022-01182. I'm Judge Hudalla, and I have with me Judges Braden and Cygan. Who do we have today from Petitioner?

MR. WARD: Good morning, Your Honors. Trent Ward joining on behalf of Petitioner.

JUDGE HUDALLA: Good morning. Anyone else with you today, Mr. Ward?

MR. WARD: No, just me today. Thank you.

JUDGE HUDALLA: Okay. Thank you. And who do we have today from Patent Owner?

MR. THOMAS: Good morning, Your Honor. This is Warren Thomas for Patent Owner, and also Larry Aaronson.

JUDGE HUDALLA: Good morning to you. Okay. Per our Trial Hearing Order, both sides are going to have 45 minutes to argue. Petitioner will go first and may reserve rebuttal time. Patent Owner will go second and may reserve a brief sur-rebuttal. I want to remind the parties that the hearing is open to the public, we have a public line today. So please don't be discussing any confidential information, and a full transcript of this hearing will be made part of the record. A couple of reminders today about the virtual environment. If you could mute yourself when you're not speaking, if you could introduce yourself when you do speak, that would be helpful for the court reporter. And also, if you could just let us know what slide number you're on, that'd be great for not only today, but also for when we review the record. I think that's all I have today at this point. So, I guess we'll

start with you, Mr. Ward. Do you want to reserve any rebuttal time?

MR. WARD: Yes, thank you, Judge Hudalla. I'd like to reserve 15 minutes for rebuttal.

JUDGE HUDALLA: Okay. And you may begin whenever you're ready.

MR. WARD: Thank you, Your Honor. Your Honor, unlike most cases in front of you, today's case has a rather short list of issues to address. And that's due in part to the fact that there's only one ground in this case. Petitioner raised a single ground, challenging two claims. Independent Claim 6, and Dependent Claim 16. Your Honors, in response to our Petition, the Patent Owner raised three arguments, and I've set those out for you on slide 3 of the Petitioner's Demonstratives. And I'd like to use my initial time this morning to address those three arguments, and I'll give you the spoiler with respect to the third argument, which is that Patent Owner's third argument is essentially Dependent Claim 16 should survive (INDISCERNIBLE). So accordingly, since we have two arguments to address from the Patent Owner's response.

Slide 4. I'll start by addressing the first argument from Patent Owner, and specifically, the Patent Owner argues that our proposed combination doesn't teach the separating step from Independent Claim 6. The first clause of Independent Claim 6 recites spatially and temporally separating and analyzing the details of said frames. The Patent Owner argues that our proposed combination doesn't teach the separating step, but specifically, Your Honors, Patent Owner argues that it doesn't teach its proposed construction of this separating step in Claim 6.

What I've set forth on slide 4 in the colored text there is Patent

Owner's proposed construction for the separating step (INDISCERNIBLE). Patent Owner proposes that the separating step should be construed as setting apart, isolating, or dividing into parts spatial elements of an image composed of pixels that have high frequency content of the frames, setting apart, isolating, dividing into parts the temporal elements of an image composed of pixels that have high frequency content of frames relative to an earlier frame. I don't know about Your Honors, whenever I read a proposed construction that's significantly longer than the claim term it's supposed to construe, I have pause and won't be surprised if Petitioner does not agree with this proposed construction.

But regardless, Your Honor, even if this proposed instruction is adopted, the cited combination, Chiu in view of Gu, and I'll smirk when I say that ground today, but Chiu in view of Gu, and the knowledge of an ordinary and skilled artisan, teaches even the limitations set forth in Patent Owner's proposed instructions.

And on slide 5, I've identified those teachings from the Gu reference. This is specifically what was cited, the Gu reference for the proposed combination Chiu and Gu. And it's the teachings of Gu with respect to this separator. And the three bullet points on slide 5 show you the three operators that we (INDISCERNIBLE) specifically rely upon. The first operator is mg(x,y). MG stands for maximal weighted average of luminance. Mg(x,y) operator imports Gu's teachings, calculates the spatial textural characteristics due to local luminance changes. The next operator is bg(x,y). Bg stands for background luminance. Bg(x,y) imports in Gu's teachings calculates the spatial average patent elements.

And then finally ild(x,y,n), and ild stands for interframe luminance

difference. And that operator calculates the temporal characteristics due to motion due to temporal and intensity changes. So as Petitioner described in its Petition, Gu teaches the claim spatially and temporally separating details by disclosing mg(x,y) which involves spatial high pass filtering. Bg(x,y) which involves spatial lowpass filtering, and both of those occurring in spatial domain. So, mg and bg are spatial valuations, and ild which involves creating a different (INDISCERNIBLE). That is a spatial temporally separate. Moving on to slide 6, --

JUDGE CYGAN: Mr. Ward?

MR. WARD: Yes.

JUDGE CYGAN: This is Judge Cygan. I have a question for you on Gu. Which of these calculations would you consider to be identifying the details, and which would you consider to be separating the details?

MR. WARD: And by identifying the details, Judge Cygan, I guess I would ask, to which paper (INDISCERNIBLE)?

JUDGE CYGAN: Well, when we're looking at something like mg(x,y), they're doing luminance calculations to determine the background intensity around different pixels. But that -- isn't that just an identification? I don't see how that's separating out that particular pixel.

MR. WARD: So, the Gu disclosure for the operands bg, mg, and ild, these are part of a Gu's disclosure that's expected, just noticeable distortion. So, it's set forth on column 9, Gu talks about the generation of just noticeable distortion. So, the mg, bg, and ild are part of that just noticeable distortion model. So, mg, for example, and this is column 10 of the Gu reference, it is the value across the pixel that's determined by calculating weighted average changes around the pixel in four directions.

So, it's the determination of a maximal weighted average of luminance around that.

JUDGE CYGAN: Right. So, then you get to get to your weighted average, how is that spatially separating that pixel? And are you considering just each individual pixel, the detail? I know that that's the case because you're talking about looking to see if the detail is new across different frames.

MR. WARD: Right, that would be the movement, Your Honor, would be the temporal calculations of comparing frame to frame to determine the difference between groups. But we would suggest that due to some spatial analysis is with respect to both bg and mg, and that it is determining, for instance, what mg spatial textural characteristics due to local and luminous changes around the pixel. So how does that pixel compare to its neighbor?

JUDGE CYGAN: So, if it's the same intensity as its neighbors, then it's not going to, is that, is it, are you contending that that's not a detail? Because then mg would be zero at that point, of the same, we'd have no change around it. So, would that be detail?

MR. WARD: Well, Your Honor, that would -- it goes to essentially, the construction of detail. And we proffer that the detail is construed as a pixel or a group of pixels that is detectable and distinguishable by the human vision system. So, what the '532 Patent talks about is detectable versus distinguishable for detail. And the Gu disclosure is using its JND model, as we understand it, to aid in that calculation as to where in the human visual perception system what a particular pixel is.

JUDGE CYGAN: So let's assume that mg(x,y) is going to be

some number greater than zero that you're going to count as a detail. So, the mg calculation identifies that the gradient has changed around it. Don't you need a further step to separate it out? You run a calculation around it. You've identified some property of the area around the pixel, but how are you contending that it's separated out? Are you contending that it's being separated just because of the mg calculation, or are you looking to the ild calculation?

MR. WARD: The combination of all of them, Your Honor, and that's what we would cite to the JND model, just to know some of the distortion models. So, all of these operators generating an analysis that can be relied upon to determine whether or not where in the model a particular pixel relates, or a group of pixels, whether or not it is something that would be detected by or distinguished by the human eye, both low particular threshold, and it's essentially data that can either not be stored or minimally associated with a particular threshold, then more data needs to be either analyzed and stored associated with that particular pixel.

JUDGE CYGAN: So, are you really pointing to the JND profile as performing that spatial and temporal separation?

MR. WARD: Well, what we would point to is Gu's disclosure of the use of all of these operators as part of this JND model to ultimately separate and analyze pixels both spatially and temporally.

JUDGE CYGAN: Okay, thank you.

MR. WARD: Certainly.

JUDGE HUDALLA: Mr. Ward, I had a question just about the last demonstrative you had there, demonstrative number 5.

MR. WARD: Yes.

JUDGE HUDALLA: All the cites on here are the reply arguments. I think this is trying to respond to Patent Owner's proposed construction. I mean, it seems to me like there's no real difference between your reply arguments and your petition arguments in response to their construction. Is that a fair assessment?

MR. WARD: Absolutely, because as I mentioned earlier, Judge Hudalla, you know, the cited disclosures from Chiu and Gu teach the claim limitations even under the proposed instruction by the patent. So, you know, as we -- combination as proposed in the petition is unchanged in the reply.

JUDGE HUDALLA: I just wanted to clarify that we don't even have to even entertain a further reply argument to get to that place. Is that right?

MR. WARD: Well, I guess, Judge Hudalla, I would ask what do you mean by entertaining the reply arguments?

JUDGE HUDALLA: Well, for instance, your reply brief came in after they proposed their instruction. And, you know, as I said in demonstrative slide 5, you only cite to the reply. In that case, a lot of times a petitioner will come in and say, well, here's some further gloss that wasn't in the petition that gets me over this hump to show that, you know, we still can show Patent Owner's construction. What I'm trying to ask you is just, it seems to me like we don't even need any further gloss on what was in the Petition by your reckoning of, you know, how they have applied the construction here.

MR. WARD: I would agree with that, Judge Hudalla. And in fact, if you take a look at these portions of our reply brief that I'm citing to you in slide 5, we've identified specifically where in the Petition this is set forth

and it's unchanged from what was said in the Petition.

JUDGE HUDALLA: Okay. I think I understand the position. Thank you.

MR. WARD: So moving on to slide 6, our expert Dr. Karam testified that a person of ordinary skill in the art would have understood these functions in forms and separated details because they relate to neighboring pixels. They relate neighboring pixels to one another, both within the frame to which they belong and between frames. Dr. Karam further says that these steps in view are about figuring out how the neighboring pixels relate to each other. And this testimony is given to Your Honors in paragraphs 80 to 84 of Dr. Karam's declaration.

And I'd recommend this to you, and particularly to Judge Cygan, to your questions where Dr. Karam explains exactly the calculations and how to use its JND model. And importantly, Your Honors, this testimony from Dr. Karam stands unrebutted since the Patent Owner did not introduce an expert, and significantly, Your Honors, Patent Owner chose not to cross-examine Dr. Karam on her testimony. They chose not to cross-examine Dr. Karam.

So, moving on to slide 7, as part of Argument 1, Patent Owner argues that our proposed combination does not teach the claim separated set because the references teach per pixel instead of per frame. As we hear from the Patent Owner on this particular point today, a number of their arguments relate to this per pixel, per frame analysis. But importantly, Your Honors, Claim 6, nor Dependent Claim 16, they do not exclude separating or filtering based upon pixels. And in fact, this is exactly what is disclosed in the '532 Patent with respect to the separating and analyzing step. I'll cite to you

specifically the spatial temporal analyzer.

On slide 7 I'm giving you the quote there from the '532 Patent about spatial temporal analyzer 50, which is the specification describes just carrying out the separators. And specifically, column 31, I'm sorry column 6, line 31. The '532 Patent says the spatial temporal of analyzer 50 generates a plurality of filtered frames from the current frame, each filtered through a different high pass filter. A few sentences later in that same column, column 6 of the '532 Patent, the '532 Patent gives an example of analyzer 50.

And it states, as I've reproduced there for you on slide 7, for example, a filter, so essentially the filter implementing analyzer 50, filter implementing cosine to the 10th x, takes 10 pixels around the pixel of, five to one side, five to the other side of the pixel interest. So, Your Honors, the '532 Patent discloses that its spatial temporal analyzer performs the separating step based upon calculations and processing performed on pixels. And for these arguments about pixel analysis versus frame analysis are without merit.

Moving on to slide 8, Patent Owner also argues that it's wrong to view the thing from which the details are separated as pixels as opposed to frames. Yet, this is also contrary to what we just talked about by the two patents disclosure and perspective. Analyzer 50 performing a pixel-based analysis. And even if a filter is used to filter an entire frame, that happens on a pixel level. Filters apply on pixels.

Moving on to slide 9, Patent Owner also asserts that calculating characteristics of pixels based upon neighboring pixels is not a disclosure of separating pixels from frames as claim 6 requires. But this attorney

argument is not supported by any evidence in Dr. Karam's testimony. Characteristics of neighboring pixels correlated with the per-frame analysis of the details of local pixels. She says that a person of ordinary skill in the art would have understood these functions, and performs separating details between the linked neighboring pixels and the other, but within the frame to which they belong, and between the frames. The Patent Owner suggests that Dr. Karam's testimony shifts from analysis of local characteristics to the per frame analysis. The Patent Owner fails to offer anything but Dr. Karam's testimony and relating neighboring pixels with none of these analyses will ultimately be reached in the entire frame. Looking at the frame, you look at it pixel by pixel, but eventually you analyze the entire frame.

Set forth on slide 10, Patent Owner further asserts that the Petitioner is internally inconsistent with its interpretation of details because according to the Patent Owner, Petitioner is reinterpreting the details in the calculation of mg, bg and ild, which is inconsistent with our Petition, that a pixel, a detail is a pixel or a group of pixels, that's detectable or distinguishable by the human visual system. This is merely just a mischaracterization of Petitioner's mapping. You don't map the details to use operators in mg, bg, and ild. We map to separate the Step 2 of those operators (INDISCERNIBLE).

And specifically, Your Honors, I want to point out a particular portion of the '532 Patent that I think is important and a limit to. I've referred back to this many times myself, so I'd like to ask Your Honors if you could pull up the '532 Patent and I want to direct you to a particular disclosure in column 4, so if you could turn to column 5 please. I'm going to read to you what is set forth in column 5, line 10. It says this, the present

invention is a method for describing and then encoding images based upon which details in the image can be distinguished by the human eye and which ones can only be detected by it.

Once again, going back to this whole idea of, you know, essentially what the '532 Patent is describing is the line efficiencies in human perception to reduce the calculations, transmission, data source associated with motion video. And by separating things into details, those that can be distinguished and those that can be detected. So just moving on in column 5 there, the next paragraph says, reference is now made to Figure 1, which is a grayscale image of the plurality of shapes of a bird in flight, painting from a photograph of one, maybe ten, to a very stylized version of one. The background of the image is very dark, but the top of the image is very light. The human eye can distinguish most birds of the image.

However, there's at least one bird labeled 14, which the eye can detect, but cannot determine all of its relevant contrasting features. Furthermore, there are large swaths of the image in the background which have no details in them. The present invention is a method and system for syntactic encoding of video frames before they're sent to the standard video compression unit. The present invention separates the details of the frame into two different types. Here's where the '532 Patent tells us the two different types of details. Those that can be detected, for which only one bit will suffice to describe each of their pixels, based on on-off or detection, and those which can be distinct, which means three bits are needed to describe each pixel.

I think this is an important disclosure, and I wanted to point it out, identify it to Your Honors. Where it's talking specifically, the '532 Patent,

talking specifically about what the details are, and what types of details there are. This is how we came to our proposal with respect to detail. We didn't give Your Honors a specific construction or detail, but what we did say in the Petition is that the detail has to be at least encompass what's described, and that a detail is a pixel or a group of pixels that is detectable and distinguishable by the human visual system.

So now moving to slide 11. Petitioner's expert, Dr. Karam, testified that details are pixels or groups of pixels that are related based upon the individual perception. And the Patent Owner didn't dispute Dr. Karam's testimony. And the Patent Owner comes back in their response with their proposed construction of details and set forth on slide 11. They say that our interpretation of details is too broad. They assert that the term should be construed as elements of an image composed of pixels that have high frequency content. Patent Owner's proposed construction is not supported by the record.

And moving on to slide 12, Patent Owner doesn't provide us a site to the single use of the term element in the '532 Patent. Nor does it explain or attempt to explain what constitutes an element. I'm still unclear about what is an element of an issue. There's no description of elements in the specification. But there is, is we just saw, a description of details. In fact, the Patent Owner's response on page 7, the Patent Owner concedes that details are composed of multiple pixels.

Slide 13 is a recitation of a few of the examples, a few additional examples in the '532 Patent of discussion of details already read to you, which appears in bullet point two on slide 15. The additional one that I'll highlight for you is the last bullet point on slide 13, in which, in discussing

the details the ’532 Patent, talks about filters. This is back to the Analyzer 50 discussion we talked about earlier. It says, filters HPF-R1 and HPF-C1 contain only very small details of one to four pixels. Importantly, Your Honors, it says right there in the ’532 Patent that a detail can be can’t be as small as one pixel. Very small details in the frame of one to four pixels. Also says, high pass filter R3 contains much larger details, up to 11 pixels. So as described to us in the ’532 Patent, the details can be a pixel or a group of pixels depending upon relative size. And this example is 1 to 11 pixels.

Moving on to slide 14, Patent Owner’s only attempt to overcome the lack of intrinsic evidence to support this proposed construction for elements of an image, with respect to details is to cite extrinsic evidence. They cite to Exhibit 2001 and Exhibit 2003. These relate to definitions or certain terms. And, Your Honors, these definitions postdate the ’532 Patent, specifically to 2001, so Merriam-Webster’s definition from 2023, and the Patent Owner failed to offer any explanations to why or how that current day definition would inform the inquiry for a person of ordinary skill in the art 23 years ago, and by way of ’532 Patent. And it’s on that basis, and other (INDISCERNIBLE) as well, Your Honors, (INDISCERNIBLE).

Moving on to slide 15. Patent Owner also argues that the details should be limited to high frequency content. It’s part of their proposed instruction for details as well. But the ’532 Patent specification made it clear that there are two kinds of details, those that can be detected and those that can be distinguished. And the citations that you’ll see in Patent Owner’s slides with respect to details relate to those that can be distinguished in discussion of high pass filtering associated with those. But it doesn’t address the detection and the ’532 Patent has significant disclosure

about low pass filtering as well, at the bottom of column 9. And in column 10, it's an entire table of low pass filtering that's disclosed in the '532 Patent. So, Patent Owner doesn't explain to us --

JUDGE BRADEN: Counsel --

MR. WARD: Yes.

JUDGE BRADEN: -- in Patent Owner's response, page 8, they make an argument saying that every pixel must either be part of a detail or not part of a detail. And cites two column 5, lines 24 to 25, same of the patent. Large swaths of the image in the background have no details in them, saying these swaths of image with no details are still comprised of pixels, and these pixels accordingly cannot be part of a detail. Please give us Petitioner's rationale for why that's incorrect.

MR. WARD: Well, I appreciate the question, Judge Braden, and if we can turn to my slide 16, where I give you that quote in the '532 Patent, there are large swaths of the image in the background which have no details in them. Patent Owner asserts that their response, pages 8 and 9, that you referenced to Judge Braden, that all pixels are classified as either detected or distinguished, but in fact, the '532 Patent tells us that some parts of the background, some parts of the image, primarily large swaths of the background, have no details. So, there will be parts of the image that don't constitute details, i.e., what the '532 Patent refers to as something that the individual system can either detect or distinguish.

JUDGE BRADEN: Thank you, counselor.

JUDGE HUDALLA: Mr. Ward?

MR. WARD: Yes.

JUDGE HUDALLA: I just had a quick question about the high

frequency content slide you had, slide 15.

MR. WARD: Yes.

JUDGE HUDALLA: You just referenced low pass filters in the '532 Patent that are at about column 9, column 10. I wanted to ask you about that a little bit more. What's the purpose of the low pass filters? What is the patent looking for with those low pass filters?

MR. WARD: So, column 9, down at line 61, (INDISCERNIBLE) tells us that the low pass filters are associated with the high pass filters used in Analyzer 50, and the cutoff frequencies for the low pass filters are close to those of the high pass filters. Low pass filters pass that which their associated high pass filters ignore. So, essentially, as I understand the '532 Patent's disclosure on this point, that you're essentially using the low pass filters to process and analyze the portion of the image that would not have been processed and analyzed on the high-frequency.

JUDGE HUDALLA: So, in some earlier discussion that you had here, and I think in your reply, you associate distinguishable details, the humanized distinguishable details, with high frequency content. So again, high pass filters. Is it true to say that the low pass filters are associated with the detected content, merely detected content?

MR. WARD: That is a possibility, Judge Hudalla, and then of course perhaps the low pass filters could be used in attempting to analyze other portions of the image, perhaps maybe other portions of the image that don't qualify as details, as Judge Braden mentioned.

JUDGE HUDALLA: Okay, so you're saying the background then as well could be part of the low pass filter?

MR. WARD: Yes.

JUDGE HUDALLA: Okay, thank you.

MR. WARD: Okay, moving on to my slide 17, I'm going to just talk briefly about Argument Two by Patent Owner. In their second argument, the Patent Owner argues that our proposed combination doesn't teach the classifying. Patent Owner argues that neither Chiu nor Gu disclose or teach classifying details into subclasses in accordance with set visual perception thresholds.

On slide 18, we identified that this assertion is misplaced as Petitioner mapped mg, bg, and ilds we talked about before to be separated, not to be classified.

JUDGE HUDALLA: Mr. Ward, I just wanted to mention that you've gone through your 30 minutes, you can continue on if you'd like.

MR. WARD: That's all I had unless Your Honors have any further questions.

JUDGE HUDALLA: I do have one further question, Mr. Ward. It had to do with the classifying step.

MR. WARD: Yes.

JUDGE HUDALLA: I wanted just to get your take. I thought there might be a bit of a typo in, and if you could turn to paragraph 113 of Dr. Karam's testimony.

MR. WARD: Yes.

JUDGE HUDALLA: Actually, on page 65, it would be the next page after paragraph 113. She has a statement in there, she says, when the number of noticeable pixels in the sub-block exceeds N sub S, they collectively occupy a majority area of the sub-block and thus are more likely to be connected. Conversely, when the number of noticeable pixels in the

sub-block exceeds N sub S, they are scarce and are more likely to be scattered randomly in the sub-block. So, my question to you is, it appears to me that there's a typo in the second part after conversely. Could you address that?

MR. WARD: I'm just trying to pick up where you are the declaration, Judge Hudalla.

JUDGE HUDALLA: I'm sorry, I --

MR. WARD: Yeah, no, I'm with you now. So you're at the top of page 65.

JUDGE HUDALLA: Correct. Yes, third line down.

MR. WARD: Third line down. When the number of noticeable pixels in a subblock exceeds n_s, they collectively occupy a majority of the area of the subblock, thus more likely to be detected. Conversely, when number of noticeable pixels in a subblock exceeds n_s, they are scarce, more likely to be scattered randomly.

JUDGE HUDALLA: As you can see there's two times it says exceeds and --

MR. WARED: Yes, right. Yes, I would agree, and I'm happy to follow up and confirm that Dr. Karam, Judge Hudalla. But yes, I think that's exactly right.

JUDGE HUDALLA: So what should the second part then read?

MR. WARD: When the number of noticeable pixels in the sub-block is less than n_s they're scarce and are more likely to be scattered randomly in the subblock would be my understanding, and I can confirm that with Dr. Karam.

JUDGE HUDALLA: Okay. Yeah, that would be great. Thank

you.

MR. WARD: Thank you.

JUDGE HUDALLA: Okay, Mr. Ward, I think you used 32 minutes there. So you'll have 13 on rebuttal. We'll turn now to Mr. Thomas, if his video is working.

MR. AARONSON: Morning. Actually, Mr. Aaronson is going to be doing the presentation. The main presentation for the Patent Owner today.

JUDGE HUDALLA: Oh, okay. Thank you, Mr. Thomas. So, Mr. Aaronson, would you like to reserve some sur-rebuttal time?

MR. AARONSON: Yes. I'd like to reserve ten minutes.

JUDGE HUDALLA: Okay. And you may begin whenever you're ready.

MR. AARONSON: Okay. Thank you very much. So, I will begin with slide 2. Patent Owner's reply, as well as the presentation here today, is really focusing on claim construction issues. So, we turn to the first construction of the term details and as alluded to by Petitioner, Patent Owner is saying that the details or elements of an image composed of pixels that have high frequency content to address the elements being disclosed in the '532 Patent. If you look at column 1, lines 15 and 16, it does parenthetically relate image elements to many pixels, so the term element does appear in the patent specification.

The question of whether pixels, not pixels, is not so important for the construction, but for Patent Owner's standpoint, the pixels having high frequency content is, and that's because the disclosed embodiments throughout the '532 all rely on high frequency content, or the detection,

and/or the determination of the pixels using high frequency content. Let me move forward to slide 3.

JUDGE HUDALLA: Mr. Aaronson?

MR. AARONSON: Yes.

JUDGE HUDALLA: Sorry to interrupt you. It's Judge Hudalla. Did I hear you to say that you are no longer contesting the notion that a detail can be a pixel or a group of pixels?

MR. AARONSON: It's not relevant to the claim construction we're proffering here. If it's a group of pixels, it can be a group of pixels. As you'll see as we flow through the spatially transforming and separating, the high frequency content flows through all the constructions that we're going to discuss here. So, if it's a group of pixels or not, makes no difference really.

JUDGE HUDALLA: Okay. And what about, can one pixel be a detail?

MR. AARONSON: As disclosed and taught in there, many pixels would be -- at least what we believe the proper construction because of the elements it wouldn't be one pixel but at least two.

JUDGE HUDALLA: Okay. And then on that very point, though I think Mr. Ward cited something in the challenged patent at column 6 at the very bottom it actually talks about very small details and says of one to four pixels. Doesn't that undermine your position? The very last line of column 6.

MR. AARONSON: Yes, I'm looking there. Again, one to four pixels, it does -- so long as the pixels have high frequency content, it really makes no difference. So, one pixel would be okay.

JUDGE HUDALLA: So, one pixel can be a detail?

MR. AARONSON: One pixel can be a detail, I'll agree with that.

JUDGE HUDALLA: Okay. And were you just about to describe your position with the high frequency content? Because I'll back off and let you do that if that's the case.

MR. AARONSON: Sure. That's -- yes, so turning to slide 3. So, Patent Owner -- he said Petitioner read through sections in column 5, describing details as being, you know, something that's distinguished or can be detected. However, those sections don't provide any real meaning to the term detail other than it's something, we don't know what, that can be distinguished or detected. The real definition is in column 6, as you look at line 27, and the discussion all the way through line 34, where details, again, are areas in which the human eye distinguishes are ones of high contrast, and ones whose details have small dimensions.

And then it goes on to say areas of high contrast are areas with a lot of high frequency content. This construction -- this is where our construction comes from, and it's consistent with the disclosed embodiment in Figure 3, which shows an analysis of the pixels based on high frequency filtering.

JUDGE CYGAN: Counsel, this is Judge Cygan.

MR. AARONSON: Yes.

JUDGE CYGAN: The section you're pointing to, isn't that only discussing the distinguished details? If I understand correctly, the Patent describes two different types of details. The detected ones, which pass through the low pass filter, and the distinguished ones, which pass through the high pass filter. It seems that seems to be represented by the quotes on

your demonstrative 3. But isn't it true that this definition that you're relying on here is only related to the distinguished details, that pass through the high pass filter?

MR. AARONSON: Well detected pixels are one that as it goes through the filtering it creates the filtered frames. Detected pixels do fall out from there. Those are the ones that are not in those filtered frames. So, the high pass filtering does work into the detection portion, or I should say detecting of the pixels.

JUDGE CYGAN: I think that's -- well, let me ask you this. If we take a look at the Patent in column 11, this is sort of following up on Judge Hudalla's question, or Mr. Ward earlier. There was a discussion around, starting at line 24, talking about the low pass filter, where it keeps the large details, and then the high pass filter retains the small details. All right, can you explain to me how your construction is keeping the high pass filter for all of the details?

MR. AARONSON: Sure, so if you go, let me just find this portion of the 532. So, in column eight -- sorry, column 11. I'm sorry, I'm looking at -- just are asking how high pass filtering relates to the detected pixels but not distinguished? So I'm just going to refer, I'll get back to column 11 in a second as I referred to column 8. I'm looking at line 43 through 46. And this is once the pixels are passed through the high pass filtering. If the pixel is not present in any of the filtered frames, then it says the pixel must belong to an object of a large size or detail that is only detected but not distinguished. So, this is the high pass filtering step.

So, the reference to figure -- in column 11 is to the intraframe processor. It's an embodiment of element 44 in Figure 3. The detection

versus the distinguishing portion of this, and this is why I said all of these claim terms kind of relied a little bit on the high pass filtering, is when you look at the spatial temporal analyzer, which is the next claim term to be discussed, it is, through its functionality, creating the temporally separated frames and the spatially separated frames, but using high pass filtering in the parameter estimator. So, the detection is actually initially done by the high pass filtering, but later that's fed into element 44 for further processing. At that point, it is already detected.

JUDGE BRADEN: Counsel, perhaps you can explain to me how your claim construction isn't leaving out half of the details, the detected details that are disclosed in the '532 Patent. It seems to me that your claim construction only gets to those that are distinguished, that have high frequency content, and you're leaving out half of the information, the detected information, the detected details that are disclosed. What am I missing here?

MR. AARONSON: Again, I think column 8 explains that we are, our construction does incorporate those pixels that are detected because it is looking at the high frequency content of the pixels. If they do not fall into the filtered frames, then they are detected. So, I believe the construction does encompass that.

JUDGE BRADEN: Okay. Thank you, counselor.

JUDGE CYGAN: And Counselor, just to make sure I understand this completely, that section of column 8 is talking about the visual perception threshold that's related to the what a person can distinguish, right?

MR. AARONSON: Correct.

JUDGE CYGAN: Or are you saying that's what a person can detect?

MR. AARONSON: What they can detect.

JUDGE CYGAN: Is there anything in the Patent that you could point me to to help me understand that the determiner 54 is about detection?

MR. AARONSON: One second. I guess I don't see anything explicit in there other than this portion of the specification.

JUDGE CYGAN: Okay. Thank you, counsel.

MR. AARONSON: So, moving on to slide 5. And this is the construction of spatially and temporally separating the details of said frames. And as Petitioner noted, the construction is a little wordy, but it does set out what is disclosed and is consistent with the claim. And you should see it be consistent with the disclosure of the embodiments in the specification.

So, if you turn to slide 6, Figure 3 shows the spatial-temporal analyzer 50, and you see two lines falling from that, pointing downward. The left-hand side, the difference frame, and then the right-hand side showing the filtered frames. And they essentially create two paths to showing the spatial separation and the temporal separation. And the temporal separation would move down to the parameter estimator through the visual threshold determiner and then back up into the inner frame processor.

Whereas the spatial separation moves along the filtered frames line to the subclass determiner and then back up to the filter selector. And to put this all in context, the low pass filtering referred to by Petitioner actually occurs in the filter selector later, and it's not part of the spatially, you know, spatially separating or temporally separating of the pixels. So, again, all the

processing happening in that dotted line encompassing elements 50, 52, 54, and 56, which we -- are all based on high pass filtering, looking at high frequency contact to determine and detect, to find pixels that can be distinguished or detected. And moving on to slide

JUDGE HUDALLA: Counsel?

MR. AARONSON: I'm sorry, yes.

JUDGE HUDALLA: So, are you trying to say that the setting apart or isolating of the processing here is to distinguish between the temporal aspects on one hand, and the spatial aspects on the other, and that there has to be separate processing for each of those?

MR. AARONSON: Yes, only -- they need to be separate because as you can see later downstream in Figure 3, they drive different elements of the disclosed embodiment to perform the encoding.

JUDGE HUDALLA: Okay, but didn't the Chiu-Gu combination proposed by Petitioner, doesn't it do that through those different operators that were shown earlier? You know, there's two that relate to the spatial domain and there's one that relates to the temporal domain.

MR. AARONSON: So, I was going to address this later, but I can address it now. Moving to -- I'm sorry, my screen just went away. Moving to the last slide, which is slide 12. So, Gu teaches, you know, different transformative algorithms that describe a weighted average of luminance, average background of luminance, and then as the alleged spatial disclosure. And then an average frame, inner frame luminance difference, which is the temporal. These all go into creating this JND profile, which is essentially an error visibility threshold. It's a transformation. It's no longer pixels, no longer operating on pixel or pixel data. It's now something completely

different. Chiu on the other hand, and this will go into our proposed construction of subclass, Chiu operates on pixels, and it indicates that it classifies pixels in its subclass determination, not a transformation of the pixels.

So, our position is that while Gu may be doing some kind of transformation, and it may be doing some kind of spatial and temporal analysis, it's not the same as what's disclosed in the '532 Patent, and when you combine it with Gu, or I should say Chiu, it can't combine them. They don't work. They're two different things. So, if I may, I'd just like to refer back to slide 7. And in slide 7, again it talks about, it's the '532 discloses that the analyzer is looking for filtered frames by passing the filter frames through a high pass filter. Again, high frequency content is looked at in determining and performing that function of spatially filtering.

Let's -- turning to slide 8, temporal filtering. The inter-frame filtering, again, you know, showing a difference between the frames. If it's on a pixel-by-pixel basis, as argued by Petitioner, it really makes no difference, but it is a separate function that is being performed for a different reason downstream as part of the transformation process. Turning to slide 9, for the claim construction of subclass. And we're offering a construction where it's an area where with pixels that are related to the same detail, and which cannot be distinguished from each other. Petitioner's construction is a characteristic of a macro block as containing small random details or large connected details.

Turning to slide 10, this goes to the function performed by the subclass determiner 56, which again is looking at output of high frequency content as part of its analysis. Claim -- sorry, page 11. So, Petitioner says

that there's no basis for our construction of subclass, but we have both literally from the specification, which indicates that the subclasses are, that they include pixels related to the same detail, which generally cannot be distinguished from each other. And again, further it says subclasses define areas whose pixels cannot be distinguished from each other later in the patent as well. And even further, again to my discussion of why high pass filtering and high frequency content is important to the term detail, is again, the subclass determiner is looking at pixels by looking at the high pass filtered frames that are beginning with the details.

So finally, again, turning to slide 12, as argued in our Patent Owner response, the combination doesn't, of Chiu and Gu, because Gu is creating this JND, which is a transformation of pixel data into something else, which is representing a visibility threshold error. When it's true looking at pixels, there is just no combination or no proper combination of these two references that's teaching the subject matter of Claim 6.

And just finally with Claim 16, again, we're just relying on the fact that it's a dependent claim from Claim 6. If Claim 6 is still patentable over the art, Claim 16 should be confirmed as well. And that's the presentation unless you have other questions.

JUDGE HUDALLA: I do, Mr. Aaronson. Could I ask you a little bit more about the subclass presentation you just made? I think in your brief, you say that table 2 in column 8 of the challenged patent has various subclasses. Is that a fair assessment?

MR. AARONSON: Yes.

JUDGE HUDALLA: Okay. So, there's a -- in Table 2, there's a listing of, it looks like, at least eight supposed subclasses. Some of them are

horizontal edge, vertical edge, small, single small detail, those sorts of things. Why would it be that the two subclasses proposed by Petitioner do not fit within the purview of this of these types of subclasses?

MR. AARONSON: So, I guess I'm not sure what you mean by the two subclasses proposed by Petitioner?

JUDGE HUDALLA: Okay well in the Petition, let me turn to that, there's -- they have their two proposed subclasses in the analysis are small random details and large connected details. And that starts at Petition page 51. So, my question to you is why aren't those consistent with the types of subclasses we see in Table 2 of the challenged patent?

MR. AARONSON: So, the inconsistency lies in how those are determined. Again, we're relying on a construction of details that the pixel includes high frequency content, which is areas of contrast. That construction that Unified is proposing is first of all using a term that doesn't exist in the patent, which is the term macro block. That's only from the extrinsic evidence. And also, it doesn't account for that these macro blocks as they allege are being determined based on a process of filtering that includes high frequency content within the pixel and then through a series of high pass filters.

JUDGE HUDALLA: Well, to be clear though, you just mentioned macro blocks. I don't think Petitioner proposed any construction for this term. That's your characterization of what you surmise to be their construction. Is that fair?

MR. AARONSON: That's what was argued in, and that's what also was, appeared in their expert's declaration.

JUDGE HUDALLA: Well, I think, I think they looked at a macro

block and decided whether it, whether or not it exceeded a certain threshold n_s to determine whether they fit into one subclass or another. They're not saying that the macro blocks themselves are the details in that instance.

MR. AARONSON: Okay, and I maybe didn't see it that way, but even looking at their proposed construction, again, starting with the details, and this is why I say it's the details flow into the spatially and temporally separating, which flows into the subclass determination. It begins by looking at the high frequency content as essentially an indicator of our areas which can be distinguished, areas which can be detected, and then further processing downstream depends on that.

JUDGE HUDALLA: Okay. Thank you.

MR. AARONSON: Yeah, I guess I surmise to say our subclasses as defined in Table 2 would be meaningless without that high frequency content determination earlier.

JUDGE HUDALLA: Okay. Thank you. I think you have -- you have a lot of time left for sur-rebuttal. 23 minutes if you need it.

MR. AARONSON: Okay.

JUDGE HUDALLA: So we'll turn back to Mr. Ward. Mr. Ward, you have 13 minutes, and you may begin.

MR. WARD: Thank you, Judge Hudalla. No further comments from Petitioner.

JUDGE HUDALLA: Okay. I guess in that case there's not a lot to say on sur-rebuttal, but Mr. Aaronson, I'll give you a brief moment if you want to make one final comment.

MR. AARONSON: No comments.

JUDGE HUDALLA: Okay. All right. Well, thank you very

much for your presentations today. We appreciate it. It was helpful. And the case is submitted, and we are adjourned. Thank you.

(Whereupon, the above-entitled matter went off the record at 10:58 a.m.)

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