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Transcript of Henry Houh, Ph.D.

Date: February 25, 2025

Case: VusionGroup SA -v- Hanshow Technology Co., LTD. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3

4 VUSIONGROUP SA,

5 Petitioner,

6 v.

7 HANSHOW TECHNOLOGY CO., LTD.,

8 Patent Owner.
9

10
11 US PATENT NO. 11,540,216

12 Case IPR2024-00857
13

14
15 REMOTE DEPOSITION OF HENRY HOUH, Ph.D.

16 Tuesday, February 25, 2025

17 10:36 a.m.
18
19

20 Job No: 572021

21 Pages: 1 - 117

22 Reporter By: Karen Klerekoper, CSR-4250, RPR

1 The deposition of HENRY HOUH, Ph.D., held
2 remotely pursuant to notice before Karen
3 Klerekoper, CSR-4250, RPR, a certified shorthand
4 reporter.

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A P P E A R A N C E S

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EXHIBITS:

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Exhibit 1004, Dr. Houh's CV

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Exhibit 1003, Dr. Houh's declaration

20

1 P R O C E E D I N G S

2 (Oath stipulation read and agreed by counsel
3 and witness.)

4 DR. HENRY HOUH, having been duly sworn
5 testified as follows:

6 EXAMINATION

7 BY MR. TAN:

8 Q Dr. Houh, thank you for joining us this
9 morning. My name is Hao Tan. I represent Hanshow
10 Technology, the patent owner.

11 Would you please state your full name?

12 A My name is Henry H. Houh, and that's
13 spelled H-O-U-H.

14 Q Do you have any other names?

15 A No.

16 Q Okay. Dr. Houh, you understand this
17 deposition is for the IPR proceedings 2024-00963
18 regarding U.S. Patent 10,701,321, right.

19 A Yes.

20 Q Dr. Houh, I understand you have been
21 acting as an expert witness for many IPR
22 proceedings. Would you agree that you are

1 familiar with the general procedure of deposition?

2 A Generally, yes.

3 Q Okay. I will be asking questions, you
4 know. Let's answer each question verbally so that
5 we can understand each other. If my question is
6 not clear, you can ask me to rephrase. I'll try
7 to do my best, but if you answer my question, I'll
8 assume that you understand what I'm saying.

9 A Sure.

10 Q So, Dr. Houh, when did you start working
11 on this case.

12 A I don't remember the exact date.

13 Q Do you remember...

14 A I mean, I don't know. It was sometime
15 before I submitted my declaration but I don't even
16 remember how much before.

17 Q Okay. How much time did you spend,
18 roughly, on preparing this declaration?

19 A I don't remember offhand.

20 Q Do you have a rough number, like a week, a
21 few weeks?

22 MR. MARANDO: Objection, form.

1 A I wouldn't want to speculate. I really --
2 don't know. I worked in a lot of different cases,
3 so I don't know offhand.

4 Q Okay. So, Dr. Houh, tell me about your
5 work after you got with your PhD from MIT --

6 (Off the record.)

7 (The court reporter asked for clarification.)

8 Q Dr. Houh, could you tell us about your
9 professional experience after you finished your
10 PhD at MIT?

11 A So, may I look at my CV, which is Exhibit
12 1004 in this case? I have printed copies of the
13 exhibits here.

14 Q Of course.

15 A Okay. So after I graduated, actually I
16 was finishing my PhD, I started working at a
17 company called NBX Corporation.

18 NBX Corporation was a telecom company
19 making -- we actually shipped the first business
20 telephone system that ran over the company's data
21 network. And so that was NBX.

22 And I was working on and a number of

1 different things there, designing protocols,
2 writing -- writing a prototype code for new
3 features. I architected the next generation
4 larger scale product. I designed the audio
5 reconstruction algorithms.

6 And then that company subsequently was
7 purchased by 3COM Corporation, and I stayed
8 working there for a short amount of time, and then
9 I moved on.

10 I think then the next job I have listed on
11 my CV is that I worked a company called -- I
12 joined a company called Teradyne with all their
13 software test groups. And I was working with all
14 the software test units. Teradyne was a
15 semiconductor test company and -- but they -- so
16 they made big machines that test computer chips,
17 but they were working on shifting into testing
18 software. So the chairman had acquired a number
19 of different businesses. And I went to work with
20 the software test division, all the companies to
21 work on strategy, things like that.

22 And I then subsequently joined one of the

1 groups as an engineering manager. That was the
2 Hammer Technologies division. And then Hammer
3 Technologies was telecom test equipment provider;
4 and used by many of the large telecom equipment
5 providers to test their telecom systems.

6 And I designed a new product there for
7 data network testing. I led the engineering -- I
8 raised -- I presented to the board, got approval
9 for a budget for developing this new product, and
10 I managed the engineering of the product, and we
11 shipped that product.

12 Let's see, what else did I do there?

13 Then subsequent to that, I shifted to
14 another division with -- oh, I think there was a
15 spinoff of Teradyne of all the software test units
16 into a company called Empirix. I don't remember
17 exactly at what time that happened relative to my
18 work at Hammer.

19 But I joined a -- a -- the web test
20 division that made a product called eTester. And
21 that was used by many big companies to test their
22 websites for functional and load testing -- before

1 -- or before major releases of their -- of their
2 websites.

3 And then I was, yeah, the chief
4 technologist and manager, and I helped redesign,
5 re-architect the next generation product.

6 Subsequent to that, I -- I joined
7 Commonwealth Capital, which is a venture capital
8 company, to work with one of the partners there on
9 potential new startups or -- but that led to --
10 that VC helped lead the spinout of BBN
11 technologies from Verizon. And so both partner at
12 the VC firm and I joined BBN -- that was around
13 2024 -- to work on commercializing technology that
14 had been developed within BBN.

15 BBN was an age-old R&D firm that had the
16 original contract to build the APRAnet, and design
17 the first -- it wasn't called it back then, but
18 build the first network router.

19 And -- and my boss -- or, yeah, the -- the
20 guy I worked with at the venture capital firm
21 became my boss at the company. He led a new
22 division called the Delta division, and our

1 overall role was to manage the intellectual
2 property and actually figure out BBN, and figure
3 out to commercialize intellectual property, mainly
4 by creating internal startup withes that might
5 spinout that leverage the technology.

6 So, at -- at the BBN, let's see, I worked
7 on creating a few new businesses. I wrote a
8 number OF business plans potential new business
9 within BBN, that potentially spinout. Two of them
10 were funded.

11 I wrote a call center business plan that
12 BBN had an existing service whereby they used
13 their internal technology to gauge the -- to
14 follow and track calls into call centers to give
15 an assessment of how the call center is
16 performing.

17 And I turned that into basically a
18 software as a service where all calls into a call
19 center could be recorded, run through a BBN's
20 speech detects engine to gauge -- to look for key
21 words if customers were upset, swearing -- could
22 actually gauge their emotional response level, you

1 know, were there angry? Were the fine?

2 And I hired the engineers to build that
3 out. And I then hired a general manager to take
4 over that business.

5 And that I think that -- I'm not sure
6 where that company is today but that company ran
7 for -- was runnings well past the time that I left
8 BBN.

9 (Technical difficulty.)

10 (Off the record.)

11 THE WITNESS: So, another project I worked
12 on at BBN was a spinout called PodZinger.

13 And PodZinger, we took a BBN's speech
14 and -- language/speech recognition and natural
15 language processing systems.

16 We applied it to web search, so we -- I
17 helped -- I hired an engineer, helped create a
18 prototype website, or the first website, where we
19 initially took video and audio podcasts and ran
20 the audio through a speech recognition and built a
21 search index based on the spoken words within
22 audio and video podcast. And we made that

1 searchable.

2 And had basically a search website, which
3 you could then pull up the search results which
4 would list each video or audio podcast, and
5 provide a pseudo transcript where you could like
6 click into the words you were searching for and
7 jump directly to the right point in the audio or
8 video where that -- exactly where that word was
9 spoken.

10 And that was -- BBN was one the pioneers
11 in applying neural networks to -- to speech
12 recognition. And had great success.

13 At the time we did the spinout, BBN had
14 the top speaker independent large language speech
15 recognition system available for, I think,
16 government benchmark testing.

17 And so we spun that out into a company.
18 Actually, that did get external funding. We
19 raised money for venture capitalists, and that
20 became its own company.

21 I worked on another effort with BBN called
22 Boomerang. I became the interim engineering

1 manager, where we had a contract to deliver -- I
2 can't remember -- a couple hundreds units of a
3 counter-sniper system, which would mount inside a
4 Humvee. So it was a government contract. And
5 mount inside a Humvee.

6 And if a shot was fired at the Humvee,
7 even when the Humvee was moving at 40, 50 miles an
8 hour, it would be able to detect the shot and
9 announce to the people inside the cabin the
10 direction, range and elevation from where the
11 shooter was relative to the Humvee that was fired
12 at.

13 And so we had first -- first commercial
14 order of this device. And I took over all the
15 engineering of the project prior to the first --
16 prior to our delivery, coordinated and actually
17 hired some engineering resources to make the --
18 make the delivery. And we did make the delivery.

19 And subsequent to that, we -- we sold, I
20 think, the numbers I heard were approaching a
21 billion dollars worth of these devices, mostly to
22 the U.S. government, and its allies.

1 And then I had -- I hired a replacement
2 engineering manager. Well, I identified and
3 brought in, and an engineering manager was hired.

4 And then I also identified some
5 salespeople that were brought in and hired to work
6 on selling Boomerang as well.

7 So that was another business I worked on
8 at BBN, but actually, from that project -- sorry,
9 from not Boomerang but PodZinger, the audio speech
10 recognition, I think there were a number of
11 patents we applied for that I was an inventor.

12 Some issued. I don't remember how many
13 issued, how many were just applications, but there
14 were a number of things to improve the models, and
15 update the models, the speech models, that I
16 worked on for that project.

17 Subsequent to that -- oh, I also toward
18 the end of my time there I helped build a
19 demonstration social network to kind of leverage
20 some of BBN's internal technology around semantic
21 web, and things like that.

22 But then we sold that project to a company

1 called Eons, which is a venture-funded startup
2 founded by Jeff Taylor, who started monster.com.

3 And I think we share and an investor, who
4 invested in Jeff's new company, as well as -- as
5 BBN. And I became the CTO at Eons.

6 But I left Eons and I -- I did my own
7 startup, a company called H3 Accel.

8 And we started a kids education business
9 for teaching science technology, engineering, art,
10 and math, to kids.

11 And I started that around 2009.

12 Actually, I started a robotics a couple
13 years prior to that.

14 That grew to -- in our town to hundreds of
15 kids. And so I turned that into -- into this
16 business which -- which we did business as
17 Einstein's workshop and Einstein's, you know, we
18 had weekend classes for kids.

19 We had classes in Minecraft. Actually, we
20 were one of the first STEM groups to start --
21 start -- use Minecraft in our -- in our classes.

22 So we did Minecraft classes. We had 3D

1 printing classes, programing classes, robotics
2 classes, Lego classes. A wide variety of classes
3 that I helped develop. And I hired people to help
4 develop and teach the classes as well.

5 We built our own 3D CAD software for kids,
6 because we didn't like what was available on the
7 market. We didn't feel it was very educational.

8 So we built -- a program, or a website,
9 called BlocksCAD, BlocksCAD 3D.com.

10 And we spun that out as a separate entity
11 that got funding through business accelerators.

12 We also got -- prior to the spinout we
13 also got a DARPA grant to fund the development of
14 BlocksCAD.

15 And BlocksCAD today is used in some school
16 districts around the US and maker spaces around
17 the world. And it's a -- there is a free version
18 that's still available for use.

19 And there is -- there is an upgraded, you
20 know, licensable version for use in classrooms.

21 And we have a number of school districts
22 throughout the U.S. who are customers of that.

1 I didn't -- I was on the board of spinout
2 but I didn't participate day to day beyond after
3 the spinout happened.

4 And then -- and then right around that
5 time as well, I started doing expert witness
6 consulting. And I had both started this business
7 for kids education while doing my expert witness
8 consulting. And that's when I continue to do
9 today.

10 Q Thank you. So, how many IPR proceedings
11 have you been helping as an expert, you know,
12 since then?

13 A I'm sorry, how many? I didn't heard what
14 word you used --

15 Q How many IPR proceedings you worked on.

16 A I don't -- I don't count them
17 individually, but I would say it's probably 150,
18 100, 150, 200 IPR. I don't know.

19 I mean, I understand there are tools
20 online you can look this stuff up.

21 Q Do you represent both patent owners and
22 petitioners in those proceedings?

1 A I have, yes. I have represented both
2 patent owners and petitioners.

3 Q Could you identify maybe one case that you
4 represent a patent owner?

5 A Yes. I can remember a couple cases
6 offhand. I represented Akami as patent owner
7 and some cases --

8 Q (Indiscernible crosstalk.)

9 A And then I recently represented I think
10 Aptiv Technologies. They are a chip maker,
11 against --

12 (The court reporter asked for clarification.)

13 A I think that's A-P-T-I-V, in a case
14 brought by a competitor, one their competitors,
15 Microchip, I think.

16 MR. MARANDO: Can you spell that?

17 THE WITNESS: M-I-C-R-O-C-H-I-P.

18 MR. MARANDO: What was the first one?

19 A-P-T-I-V, that was the patent owner.

20 Q Thank you.

21 Let's turn to your declaration, you know,
22 which is marked as SES-1003.

1 Do you have a clean copy of that in your
2 computer?

3 A I do have a clean copy of that on my
4 computer that I have opened now.

5 And I also have a printed copy here as
6 well. Can I use both? It's kind of convenient to
7 use both sometimes.

8 (Marked for identification Exhibit 1004,
9 Dr. Houh's CV.)

10 (Marked for identification Exhibit 1003,
11 Dr. Houh's declaration.)

12 Q That's fine. Thank you.

13 Can you turn to the end of the
14 declaration?

15 A Okay.

16 Q Is that your signature on page 133?

17 A Yes, it is.

18 Q Did you write this declaration yourself?

19 A I think these things are collaborative
20 efforts. There are certainly parts that I wrote
21 myself.

22 Q Is this your full opinion regarding this

1 proceeding?

2 MR. MARANDO: Object to form.

3 A This declaration at this point contains
4 all of my written opinions with respect to this
5 matter.

6 THE WITNESS: He looks frozen. Mr. Tan,
7 hello. Can you hear us?

8 (Off the record.)

9 BY MR. TAN:

10 Q We were just talking about your IPR
11 experience, Dr. Houh. Thank you for providing the
12 answers. Go back to your declaration. Sitting
13 here today, Dr. Houh, do you have any changes, any
14 you things you want to correct in this
15 declaration?

16 A No, I don't think so. I sometimes see
17 typos but I didn't see any of those in my review.

18 Q Thank you. On page 10 paragraph 22, of
19 your declaration, you stated: I'm not an
20 attorney. I'm, you know, preparing these opinions
21 and relying on basic legal principles that counsel
22 have explained to me.

1 Do you see that?

2 A Yes, I do.

3 Q So if we move to paragraph 34 on page 14.

4 Are you there?

5 A Yes.

6 Q Do you understand a rebuttable presumption
7 exists without the use of the term "means" for the
8 means-plus-function claim interpretation?

9 MR. MARANDO: Objection, form.

10 A I mean, I think I understand that a
11 rebuttable presumption exists that without the use
12 of the term "means," a claim term is not
13 interpreted as means-plus-function.

14 But that other nonce words like
15 "component" have been found to satisfy the
16 rebuttable presumption and invoke a
17 means-plus-function claim construction of such a
18 term, such a claim term.

19 Q Would you agree with me that the term
20 "system" is not means of component?

21 MR. MARANDO: Objection, form.

22 A Well, I mean, it's -- they're are

1 different words but I understand that -- I do have
2 some opinions in my claim construction section of
3 my report that address claim terms with the word
4 "system" in them.

5 Q Is your answer yes or no to my last
6 question?

7 MR. MARANDO: Objection, form.

8 A Well, I mean, the word "component" and the
9 word "system," they are two different words, but
10 the system limitations, the limitations in the
11 claims do not appear to recite sufficient
12 structure in the claims.

13 And then I discuss three different claims,
14 a claim terms in my claim construction section
15 with respect -- that -- to the use of the word
16 "system" in those claim terms.

17 A So in paragraph 35 of your
18 declaration -- are you there?

19 A I am now, yes.

20 Q So here you stated: A petitioner seeking
21 to demonstrate that the prior art disclose a
22 means-plus-function limitation must prove that the

1 corresponding structure was present in the prior
2 art and performing the same claimed function.

3 Right?

4 A Yes, that's what it says.

5 Q So, what is the corresponding structure
6 you identified here regarding the '321 patent
7 about the "system" terms you just mentioned?

8 MR. MARANDO: Objection, form.

9 A So, if you look on page -- it's PDF page
10 31, which is page 26 of my declaration, I talk
11 about the structure in that section, which is the
12 structure for object detection system is a
13 processor with memory in a local analytic system,
14 local camera or local gateway.

15 And in the -- and in the other tables that
16 are under the corresponding term with the word
17 "system," I -- I -- I say what the structure is.

18 And then -- and then -- in the -- in
19 the -- in the analysis section of respective
20 claims, at least -- at least once in each of the
21 claims that I have listed, I talk about the
22 structure that I identified in the prior art.

1 Q Okay. Thank you. So, in paragraph 52,
2 right, of those, the structures in the '321 patent
3 itself that a POSITA can understand?

4 MR. MARANDO: Objection --

5 Q -- in your opinion?

6 MR. MARANDO: Form.

7 A Well, I mean, the specification I believe
8 lacks disclosure of sufficient algorithms that
9 perform the claim function, so I think that's part
10 of what my opinion is.

11 But I've identified parts of the
12 specification that talk about a processor with
13 memory and -- and which components within the
14 system have that. If you look at the cited
15 portions that I've got in these tables.

16 But I did not see any algorithms that
17 perform the claim functions. They're at best kind
18 of a black box that -- that -- but the disclosure
19 I did not see sufficient algorithms to perform any
20 of the claim functions, as I've outlined in I
21 think page 26.

22 Q Let's go to paragraph 58. I think that's

1 page 28 and 29.

2 A Okay.

3 Q Does Laganiere '363 perform video
4 analytics at both the video source and central
5 server?

6 MR. MARANDO: Objection, form.

7 A Did you say the '363?

8 Q Yes.

9 A Can I pull up a copy of that?

10 Q Sure.

11 A What I say here in -- with respect to the
12 Laganiere '363 is that the video data is captured
13 and pre-processed using video analytics at the
14 video sources to produce a data stream.

15 And it goes on in my declaration, but if
16 you look at paragraph 34, it does say kind of
17 about a third of the way down, there is sentence
18 that says: At 302 the video data is pre-processed
19 at the source end using video analytics other than
20 a compression algorithm.

21 So, the Laganiere '363 is teaching that
22 there are video analytics performed at the source

1 end of the system.

2 Q Could you explain to me what is the video
3 analytics at the source end of the Laganiere '363
4 here?

5 MR. MARANDO: Objection, form.

6 A So, I want to point you to both paragraphs
7 21 and 41. And I talk about those and cite them
8 in paragraph 58 of my declaration. But 21 gives
9 some examples of -- it says -- 21 says:
10 Pre-processing is defined as using video analytics
11 to detect an event in interest video data prior to
12 transmitting the video data from a source end to a
13 destination end via a wide-area network WAN.

14 Some nonlimiting examples of a WAN -- I'm
15 going to skip that.

16 I'm going to go down three lines, or so,
17 it says: Pre-processing further includes at least
18 one of, one, formatting differently a first
19 portion of the video data in which the event of
20 interest is detected compared to a second other
21 portion of the video data in which the event of
22 interest is other than detected.

1 And two, reducing the bandwidth
2 requirement for transmitting the video data.

3 And it goes on. And then there's an
4 example in paragraph 41, and one of the examples
5 given in the Laganiere '363 is that, it says in
6 paragraph 41: By way of a specific and
7 nonlimiting example, the first video analytics
8 locates is vehicle license plate within video data
9 captured using a video camera that monitors a
10 parking lot entrance.

11 And then it says: Optionally a
12 predetermined number of frames of the video data,
13 such as, for instance, one frame, is transmitted
14 to the central location via WAN 106 where second
15 video analytics is performed for determining a
16 license plate number.

17 Optionally, an area of each frame outside
18 a region that contains the identified license
19 plate as cropped such that only the region of
20 video data that contains the identified license
21 plate is transmitted to the central location via
22 WAN 106.

1 So what that's teaching is there are these
2 types of video analytics. And one example that's
3 done on the source is that the license plate is
4 cropped, and the rest of the frame is excluded
5 from the cropped portion so that only the license
6 plate -- the region that contains the license
7 plate is -- is sent to the central location.

8 And so, that's -- those are some -- that's
9 one example of -- of the broader video analytics
10 described in 21 as given in paragraph 41.

11 Q So, would you agree with me then the
12 Laganiere '363 performed the video analytics
13 functions at both the video source and the central
14 server?

15 MR. MARANDO: Objection, form.

16 A Well, the one example that I read in
17 paragraph 41 does say that there are some
18 analytics performed on the source, which involve
19 cropping -- detecting the license plate and
20 cropping out everything else but the license plate
21 to send to the central location.

22 And it does say where second video

1 analytics is performed for determining a license
2 plate number but the -- that is a different
3 matter. It's the second one isn't cropping again.
4 It's analyzing the received frame to determine the
5 license plate number from the data that was sent.

6 Q Thank you. Let's go to page 37, paragraph
7 73 of your declaration.

8 A Okay.

9 Q So on top of page 37, there is a figure 2
10 from Laganriere '363, right?

11 A Yes, I've highlighted portions of that
12 figure.

13 Q Yeah. And based on the example you just
14 identified from paragraph 41 of the Laganriere
15 '363, there seems to be three video analytics
16 boxes on the right side of that figure, right?

17 A I mean, I do see three boxes labeled video
18 analytics 1, video analytics 2 and video analytics
19 3, with labels 120, 122 and 124 respectively on
20 the right-hand side of figure 2.

21 Q So there is also kind of like a cloud
22 shape identified as WAN 106 in the center, right?

1 A Yes, there is a -- I do so that cloud
2 labeled 106 in the center of figure 2.

3 Q So, from this figure, it seems the video
4 source 102 and the server 108 on different sides
5 of the cloud, the WAN, right?

6 A I wouldn't -- wouldn't disagree with your
7 characterization there.

8 Q And by looking at this figure, the video
9 analytics boxes, they are all connected to the
10 server 108 on the right, right?

11 A Yeah. I mean, I do see lines from 121,
12 122 and 124 to serve labeled 108.

13 But I want to point out figure 2 is just
14 an example according to -- if you look in
15 paragraph 13, Laganiere '363, it just a block
16 diagram of a system that is suitable for
17 implementing a method according to an embodiment
18 of the instant invention. So it's really just one
19 example embodiment.

20 Q Thank you for pointing that out. I'm just
21 talk about figure 2 here on this page.

22 Let's look at paragraph 73 underneath

1 figure 2 here.

2 So, in the end, the declaration states: A
3 POSITA would have understood that this video
4 frames captured by the video came are image data,
5 right?

6 A Yes, that's what it says.

7 Q So, a POSITA understood -- would have
8 understood, you know, video frames have lots of
9 image data in it?

10 MR. MARANDO: Objection to form.

11 A I think the point here in this sentence is
12 that a video frame is the claimed image data.
13 That's what I'm talking about here, which is --
14 and that's what a POSITA would understanding.

15 Laganiere '363 talks about capturing a
16 video frames -- frames of video or frame with a
17 suitable license plate image, but that is
18 understood by a POSITA to be image data.

19 Q Thank you. Let's go to page 39, paragraph
20 77 of your declaration.

21 A Okay.

22 Q You relied on figure 5 and paragraph 19,

1 40 and 41 of Laganieri '363 to teach limitation
2 1.2, right?

3 MR. MARANDO: Objection, form.

4 A In this paragraph I rely on those
5 paragraphs, but I think the rest of the analysis
6 in the section there are further citations to
7 Laganieri '363.

8 Q Understood. So, let's look at paragraph
9 19 of Laganieri '363 which lists examples of video
10 analytics.

11 A Okay, I've looked at paragraph 19.

12 Q Thank you. Does paragraph 19 specify
13 which analytics, you know, action is performed by
14 the first video analytics or the second video
15 analytics here?

16 MR. MARANDO: Objection, form.

17 A I think if you look at the whole of what
18 Laganieri '363 is teaching, for example, if you
19 look at paragraph 41, it does talk about how the
20 first video analytics -- and that would be on the
21 source side -- locates a vehicle license plate
22 within the video data captured using a video

1 camera. And that kind of -- if you look at what's
2 in paragraph 19, locating a license plate within a
3 video frame is like the license plate
4 identification. It has to identify or locate a
5 license plate.

6 And I think in that example, for example,
7 that particular -- it -- is what's discussed in
8 paragraph 41, as -- as first video analytics
9 locates a vehicle license plate within the video
10 data.

11 And so that's -- that's one example of
12 something that would be understood to be on the
13 source -- video source side, an example of video
14 analytics there.

15 And there could be other examples that go
16 into more detail about some of these other things
17 that's discussed in 19.

18 Q So, is it your opinion that paragraph 41
19 provides the examples about the type of video
20 analytics on the source side that correspond to
21 the first video analytics in box 502 in video 5?

22 MR. MARANDO: Objection, form.

1 A I mean, paragraph 19 is discussing
2 generally video analytics and how it defines video
3 analytics.

4 But the example given in paragraph 41 is
5 specifically about identifying a license plate
6 within a frame so it can crop it.

7 And 502 is directed to the first video
8 analytics performed on the video data using a
9 first processor disposed at the source end for
10 detecting an event of interest in a portion of the
11 video data.

12 Yeah. So, box 502 is generally about the
13 first video analytics on the source end.

14 19 is generic with respect to -- it
15 doesn't say source or server end in paragraph 19
16 that I saw looking at it.

17 But some of the examples, like license
18 plate identification, could be understood to be,
19 you know, identifying a license plate within a
20 frame so you can crop it as given later in example
21 41, in paragraph 41.

22 Q So you used the term "crop it." I want to

1 understand that term a little more.

2 Is that described in paragraph 41?

3 MR. MARANDO: Objection, form.

4 A I mean, the word is used in paragraph 41
5 but when you crop an image, it means to select a
6 portion -- I mean, includes selecting a portion
7 image, and then kind of getting rid of everything
8 outside the cropped box, for example.

9 And so if you identified a license plate
10 within a frame, what it's saying is you are
11 zooming -- you are maybe drawing a
12 rectangle -- typically it's a rectangle. It
13 doesn't always have to be.

14 But you draw rectangle around the license
15 plate, get rid of all the image data outside of
16 that boundary box, and then you are only -- now
17 you've cropped out the license plate. You have
18 cropped the license plate. And you have cropped
19 out everything that wasn't the license plate that
20 was identified.

21 And so that's -- that's -- a POSITA would
22 understand that meaning of crop to include

1 that -- that which is described in paragraph 41.

2 And that's the operation which is --
3 rather than submitting the whole frame that
4 includes a small portion of the image that has the
5 license plate, it's actually cropping that license
6 plate and getting rid of the rest of the image,
7 but submitting the cropped license plate to the
8 central server. And that's part of what what's
9 being described in paragraph 41.

10 Q In paragraph 77 you bolded the sentence:
11 The first video analytics for detecting the event
12 of interest in a portion of the video data. And
13 then is it your understand that the event of
14 interest -- the detecting of the event of interest
15 is substantially the same as detecting an object
16 of interest?

17 MR. MARANDO: Objection, form.

18 A Well, I think it would be understood by a
19 POSITA that cropping out a license plate is within
20 the scope and is disclosing an example of an
21 object detection system detecting the license
22 plate, that detects objects of interest -- the

1 license plate -- within the image data, and
2 extracts portions of frames that include the
3 detected objects of interest. That's the cropped
4 license plate.

5 And sends the extracted portions of the
6 frames, and that's the submission to the central
7 server.

8 Q Thank you.

9 A And that's the -- I think if you look at
10 the whole of this section, that's -- that's the
11 mapping that I've got here.

12 Q Let's move on to paragraph 88 of your
13 declaration.

14 A Okay.

15 Q Here we are talking -- we have again
16 figure 2 on the top, and we are talking about the
17 central server level 8 in paragraph 88, right?

18 MR. MARANDO: Objection, form.

19 A I mean, I do -- I do see central server
20 108 used in a sentence in paragraph 88.

21 Q And would you agree with me that the
22 central server while it has the same or equivalent

1 structure as the video analytics system of the
2 '321 patent?

3 MR. MARANDO: Objection, form.

4 A So, with respect to video analytics
5 system, if you look on the chart on page 26, I'm
6 talking about a processor with memory in a remote
7 analytic system, remote gateway or cloud.

8 And I am talking about in 88, there is a
9 video analytics system that receives the extracted
10 portions of the image data, and that may be
11 central server 108, which is equivalent to the
12 '321 patents disclosure that the video analytics
13 system can be a node on a enterprise network.

14 And that the Laganieri '363, thus, teaches
15 the same or equivalent structure to that described
16 by the '321 patent for performing the claimed
17 functions in that.

18 In more detail, there is a Laganieri '363
19 talks about a second video analytics that performs
20 receiving and analyzing image data at a central
21 location, which is central server 108 alone or
22 with the video analytics engines 120 to 124 using

1 a second processor.

2 So that is -- I am mapping the central
3 server and its processor to the structure of video
4 analytics system.

5 Q And in the end of paragraph 88, the last
6 sentence you stated: A POSITA would have
7 understood that the systems would have required an
8 associated programming for receiving the image
9 data.

10 Can you explain what do you mean by the
11 associated programming here?

12 A Sure. For example, like in paragraph 1,
13 it talks about how the license plate is
14 transmitted to the central location via WAN 106,
15 where the second video video analytics is
16 performed for determining the license plate
17 number.

18 So a POSITA would understand, for example,
19 in that example, and generally, when there are
20 submissions to the central server, there is
21 software that receives the image data that's
22 submitted and transmitted to the central server,

1 so that it can then process appropriately the
2 image data to perform the video analytics.

3 So there is programming to receive the
4 image data which is transmitted over the network.
5 So there is code that receives and parses out the
6 image data for further processing. And that's
7 what a person of ordinary skill would have
8 understood would be present and taught by
9 Laganriere '363.

10 Q Do you also need associated hardware for
11 receiving the image data?

12 MR. MARANDO: Objection, form.

13 A Well, certainly the associated program
14 would run on the processor, and be stored in a
15 memory that held the program, the programming for
16 receiving image data, so those are both hardware
17 that the associated programming would run on and
18 within.

19 Q So, would that hardware, for example, also
20 include some, like, network card or, you know,
21 wireless adapters so that they can receive the
22 data transferred from the WAN?

1 MR. MARANDO: Objection, form.

2 (Witness reviewing document.)

3 A If you look at paragraph 27 in Laganiere
4 '363, it talks about how the system 100 optionally
5 includes a workstation 100, including a not
6 illustrated processor portion, a display device
7 and an input device with an optional workstation
8 112 is in communication with server 108 for
9 supporting end-user control and video review
10 functions.

11 Alternatively, the server 108 and optional
12 workstation 112 are combined, comprising, for
13 instance, a personal computer, including a display
14 and an input device.

15 And I think for a server to be connected
16 to a network, I think a person of ordinary skill
17 would understand that it would have some sort of
18 hardware interface to that network, whether it
19 would be a wireless interface or wired interface,
20 but there would be some hardware associated with
21 it. So I think a POSITA would understand that.

22 Q Thank you. Let's go to paragraph 91,

1 page 47 of the declaration. Then, again, we have
2 figure 5 highlighted on top of this page.

3 A Okay, paragraph 91.

4 Q And you have stated, halfway down, in 91:
5 Central server 108 may further provide the video
6 data to video engine 120 to 124 performing various
7 analysis functions, such as detecting and reading
8 a license plate and performing facial recognition.

9 Do you see that?

10 A Yes.

11 Q So, would you agree with me that detecting
12 a license plate and video license plate and
13 performing facial recognition they are all video
14 analysis functions?

15 MR. MARANDO: Objection, form.

16 (Witness reviewing document.)

17 A So, if you look at paragraph 30, paragraph
18 30 of Laganier '363, gives some specific examples
19 of what -- what video analytics 1, 2 and 3 do.

20 So, for example, by way of a specific
21 nonlimiting example, video analytics 1, labeled
22 120, text the vehicle license plate within a data

1 frame.

2 Video analytics 2, labeled 122, detects
3 the vehicle license...

4 Sorry. Video analytics 1 detects a
5 vehicle within the data frame.

6 Video analytics 2 detects the vehicle
7 license plate within data frame.

8 And video analytics 3, labeled 124, reads
9 the license plate characters.

10 And there is further examples of some of
11 the video analytics which are -- are connected to
12 the server in figure 2, certainly on the server
13 side. And there is more examples there.

14 But there are specific examples of the
15 video analytics connected to the server that
16 detects both vehicles and license plates within
17 data frame, and then reads the license plate
18 characters.

19 Q Well, your opinion here in paragraph 91,
20 they are relying on this example in paragraph 30
21 about, you know, the -- did -- you know, vehicle
22 detection, license plate detection and reading the

1 license plate characters you just referred to,
2 right?

3 MR. MARANDO: Objection, form.

4 A Well, paragraph 30 gives these examples,
5 and they also talk about facial resignation a
6 little further down, video analytics 3, 124
7 performs facial recognition.

8 So, I think that's the support for my
9 statement that we were looking originally at in
10 paragraph 91, which cited paragraphs 29 and 30.

11 Q Here, as we just discussed, all the
12 functions are performed by the central server. So
13 this analytics function of detecting reading
14 license plate and facial recognition, they are all
15 performed by the central server, right?

16 MR. MARANDO: Objection, form.

17 (Witness reviewing documents.)

18 A If you look at paragraph 35, of Laganiere
19 '363, it says in the middle -- somewhere in the
20 middle of that, just above the midpoint:
21 Alternatively, the central server 108 -- let me
22 start a little bit above that, about a third of

1 the way down: Optionally, the central server 108
2 has access to a plurality of different analytics
3 engines which may be selected individually for
4 performing the additional video analytics of the
5 pre-processed individual data.

6 Alternatively, the central server 108
7 comprises a plurality of separate processes, each
8 processor capable of performing different video
9 analytics processing of the pre-processed video
10 data.

11 So, that's an example of an alternative
12 that the central server can itself comprise
13 processors that are running the analytics.

14 Or they could also be in communication
15 with these -- as the example in figure 2, there is
16 a line connecting the server to the video
17 analytics, the different -- the three different
18 video analytics.

19 But Laganriere '363 is teaching that the
20 central server itself may comprise processors that
21 are performing the video analytics as well.

22 Q Okay. Thank you. I think we have been

1 going for a more than an hour. Maybe now is a
2 time to take a quick break.

3 Off the record.

4 (Luncheon recess.)

5 BY MR. TAN:

6 Q Dr. Houh, did you talk to anyone about the
7 deposition during the break?

8 A No.

9 Q Did you prepare for this deposition?

10 A I reviewed materials. I met with
11 attorneys.

12 Q Which attorneys did you meet with?

13 A I met with Chris Marando, Chris Moulder
14 and.

15 Q When was that meeting?

16 A We had a meeting Friday and we had a
17 meeting Monday.

18 Q How long were the meetings, roughly?

19 A I don't remember exactly, but maybe seven
20 to eight hours total.

21 Q Thank you. Let's go back to the
22 declaration. I think we were at paragraph 91 or

1 92 of the declaration.

2 If you go to page 48, above paragraph 93,
3 ar the end of 92, the declaration states: A
4 POSITA would have understood that the system would
5 have required associated programming for analyzing
6 objects of interest, (reading license plate
7 number, performing facial recognition.)

8 Could you explain to me what kind of
9 programming for analyzing objects you were
10 referring to here?

11 MR. MARANDO: Objection, form.

12 A It would have been software for performing
13 functions such as reading license plate numbers,
14 performing facial recognition.

15 Q How would a POSITA read license plate
16 number from video or image data?

17 MR. MARANDO: Objection, form.

18 A Well, I think the level of disclosure how
19 to do these things is similar to the level of
20 disclosure in the patents themselves, which
21 is -- really don't provide any algorithms
22 for -- for performing functions, the claim

1 functions.

2 And nevertheless, though, the Laganriere
3 '363 discloses some -- some examples of analyzing
4 objects, such as reading license plate numbers and
5 performing facial resignation.

6 Q Would a POSITA understand to use your
7 networks to read the license plate number at the
8 time of the invention?

9 MR. MARANDO: Objection, form.

10 I didn't understand the word you used.
11 Can you say that again?

12 Q Would a POSITA understand using your
13 networks to read the license plate number?

14 MR. MARANDO: Is that neural networks?

15 MR. TAN: Yes.

16 A I mean, that's very broad. Just saying
17 that is like saying using a computer, for
18 example -- I am not sure if that's the best
19 analogy but the use -- I don't think -- I did not
20 see -- if my search index on the Laganriere '363 is
21 correct, I did not see any reference to neural
22 network, or different forms of those in the -- in

1 my search for the '363 patent.

2 Q What is your understanding of the video
3 detection system in the '321 patent?

4 MR. MARANDO: Objection, form.

5 A With respect to what?

6 Q What is your understanding of the object
7 detection system in the '321 patent?

8 MR. MARANDO: Objection, form.

9 A So the claimed object detection system per
10 the claims themselves that perform some -- are
11 claimed to perform some particular functions.

12 So, for example, claim element 1.2 says
13 that the object detection system that detects
14 objects of interest within the image data and
15 extracts portions of frames that included detected
16 objects of interest and sends the extracted
17 portions of the frames.

18 So, that's one of the functions of the
19 claimed -- or several functions detecting objects
20 of interest within the image data.

21 Extracting portions of frames that include
22 the detected objects of interest and sends the

1 extracted portions of the frames.

2 Those are, I guess, three -- three
3 functional functions that the claimed object
4 detection system performs.

5 There is also claim element 1.5.1, 1.5.2,
6 claims 2 and 3, and 13.2.1. 13.5.1, 13.5.2.

7 14 and 15 that also talk about the
8 functions of the claimed object detection system.

9 And -- and -- so, we can go over those if
10 you would like but what the claimed object
11 detection system requires is that they perform
12 these functions that are listed in the claims
13 themselves.

14 Q If we look at '363 Laganieri, this, at
15 least in paragraph 19, of -- of the '363
16 publication, it talks about this video analytics
17 system, video analytics is defined as any
18 technology used to analyze video for specific
19 data, behavior, objects of (indiscernible).

20 Do you see that?

21 A I'm sorry, where are you looking now? I
22 don't know when were you looking.

1 Q Paragraph 19 of Laganieri '363.

2 A Well, okay, I wasn't looking there, but it
3 seems like you were reading that approximately
4 correctly.

5 Q So, as you were trying to use the video
6 analytics engine of video analytics function and
7 the central server 108 in Laganieri '363 to
8 (indiscernible) the object detection system,
9 (indiscernible), right?

10 MR. MARANDO: Objection, form.

11 A I do -- I do discuss the object detection
12 system of claim element 1.2, starting around
13 paragraph 76 of my report.

14 And that's because it's -- Laganieri may
15 not use the same words that the -- that the '321
16 patent uses. But it's disclosing the concept
17 claimed in claim element 1.2 of an object
18 detection system that detects objects of interest
19 within the image data and extracts portions of
20 frames that include the detected objects of
21 interest, and sends the extracted portions of the
22 frames.

1 I think we discussed this earlier, which
2 is that, there is -- if you look at... paragraph
3 83, Laganiere '363 does disclose the object, the
4 claimed object detection system.

5 It does disclose the detecting an event of
6 interest in a portion of the video data, objects
7 of interest within the image data, and crops, or
8 extracts portion of frames that include that
9 detected objects of interest and transmitting the
10 cropped portion of data, sends the extracted
11 portions of the frames.

12 I think I give the example within this
13 section of the license plate example, and that's
14 in the discussion in this section.

15 So -- so that's the -- that's the mapping
16 that I've done for the object detection system,
17 for part of it.

18 I did the analysis under
19 means-plus-function, which, you know, I have
20 discussed the processor and memory, and it would
21 have software in memory.

22 And then disclose how -- Laganiere

1 discloses the function to the level of -- the same
2 level of detail really as the '321 patent itself
3 disclose, which is to say that, yeah, there are
4 really no algorithms with respect to how
5 these -- how the -- the claimed functions are
6 performed in the '321 patent.

7 But what I found in the Laganier is the
8 disclosure of the same functions. And to the same
9 level of -- of -- of detail for the disclosed
10 algorithms as the '321.

11 Q So the POSITA be able to use cloud-based
12 video analytics as disclosed in the Laganier '363
13 at the time of the invention of the '321 patent?

14 MR. MARANDO: Objection, form.

15 A So, I mean, I think -- I think the
16 Laganier '363 is indeed -- I understand it is
17 prior art to the '321 patent.

18 It's describing -- it uses the words
19 "cloud computing" in the -- in its disclosure, so
20 it certainly talks about cloud services.

21 And paragraph 23, for example, at the top
22 of page 3, talks about moving the video analytics

1 processing into the cloud may reduce a client's
2 initial capital expenditure, avoid the need for
3 the client maintain a local server farm, while at
4 the same time providing available additional
5 processing capacity to support significant
6 expansion and flexibility of a client's video, for
7 example and...

8 (The court reporter asked the witness to please
9 slow down while reading from a document.)

10 A It says at the top of column 3: Moving
11 the video analytics processing into the cloud may
12 reduce a client's initial capital expenditure,
13 avoid the need for the client to maintain a local
14 server farm, while at the same time providing
15 available additional processing capability to
16 support significant expansion and flexibility of a
17 client's video analytics monitoring system.

18 Furthermore, cloud computing, as applied
19 to video analytics, supports parallel processing
20 with multiple different video analytics engines,
21 and/or, hierarchical processing with different
22 video analytics engines.

1 In addition, some video analytics
2 processing may be farmed out to third parties if
3 specialized video analytics engines are required.

4 So that's what the -- sum of what the
5 Laganiere '363 has to say about the use of cloud
6 resources.

7 Q And would you agree with me that Amazon
8 Cloud was available at the time of the invention
9 of the '321 patent?

10 MR. MARANDO: Objection, form.

11 A I didn't hear exactly what cloud you were
12 describing.

13 Q Amazon, A-M-A-Z-O-N.

14 A I don't remember the exact timeline with
15 respect to that, but --

16 (Indiscernible crosstalk.)

17 Q Go ahead.

18 A I mean, at the time of -- at the time of
19 the '321 patent are you asking about?

20 Q Yes.

21 A I'd have to do some research into the
22 exact timeline availability of Amazon Cloud. I

1 don't remember offhand when that was.

2 Q On page 20 of your declaration, there is a
3 section about cloud computing.

4 Do you see that?

5 A Okay, I see that, yeah. I don't remember
6 every word of my declaration, but I do address
7 Amazon's Elastic Compute Cloud, EC2, whose beta
8 was announced in 2006.

9 Q Do you know Amazon also provide a video
10 analytics cloud service at the time of the
11 invention of the '321 patent?

12 MR. MARANDO: Objection, form.

13 A I've heard of such a thing. I don't see
14 it addressed in this paragraph 46 of my
15 declaration but I wouldn't -- I don't know the
16 timeline there either, offhand.

17 Q That's fine. Thank you. Let's move to...

18 A I have a problem with my charger here.
19 Hold on a second.

20 It's good. Okay.

21 Q Let's go to page 49 of your declaration,
22 paragraph 96.

1 A Okay.

2 Q Would you agree with me that the different
3 business entity than the one, or more,
4 surveillance cameras could be a cloud service
5 provider such as Amazon Cloud?

6 MR. MARANDO: Objection, form.

7 A I mean, what I point to in paragraph 96,
8 is that -- and I think I just read part of this
9 paragraph not too long ago, was that Laganiere
10 '363 explains that some video analytics processing
11 may be farmed out to third parties as specialized
12 video analytics engines are required.

13 And so that's part of what I -- I map the
14 different business entity -- that the video
15 analytic system is operated by a different
16 business entity than the one, or more,
17 surveillance cameras.

18 And that's -- that, and the rest of this
19 section explains the mapping and disclosure by
20 Laganiere '363 of this claim element.

21 Q So, in other words, a POSITA would
22 understand operated by different business entity

1 could be, you know, operated by a cloud service
2 provider (as said); is that right?

3 MR. MARANDO: Objection, form.

4 A I mean, I talk about in paragraph 97 how
5 Laganiere '363 further describes various benefits
6 of moving the processing infrastructure away from
7 the clients' local network and into the cloud,
8 such as lower costs, more flexibility and parallel
9 processing.

10 And, in fact, Laganiere '363's method of
11 pre-processing video data are particularly useful
12 when subsequent video analytics processing is
13 performed in the cloud.

14 And that, also, it was well known before
15 the application for the '321 patent was filed that
16 cloud services and local surveillance cameras are
17 operated by different entities.

18 For example, Amazon S3 simple storage
19 service was announced in 2006, and that Amazon S3
20 is storage for the internet. It is designed to
21 make web skill computing easier for developers.

22 And then it goes on there, but I address

1 some of Amazon's EC2 was also announced in 2006.

2 And that goes on at rest of this paragraph.

3 Q But the Amazon Cloud services you
4 identified does not include the video analytics
5 service specifically, right?

6 MR. MARANDO: Objection, form.

7 A I mean, I do say that -- and Laganiere
8 '363 does teach, and I say here, that's at the end
9 of paragraph 98, it would also have been evident
10 to a POSITA that central server 108 and/or video
11 analytics engines 120 to 124 are operated by a
12 different business entity, and payment is required
13 for their video analytics services.

14 And than I cite to Laganiere '363 at
15 paragraphs 23 to 24, where I think it's states:
16 Cloud service is sold on demand.

17 And then also I cite to paragraph 30 of
18 Laganiere '363, which says that the video
19 analytics engines 120 to 124 are fee-per-use based
20 or subscription based.

21 And that, accordingly, it's my opinion
22 that Laganiere '363 discloses or suggests this

1 limitation because of the support that I have
2 written here in this section.

3 Q Okay. Thank you.

4 Go to the next page part of 101 of the
5 declaration.

6 A Okay.

7 Q Pointed out to a process for identifying
8 license plates; what does that mean?

9 MR. MARANDO: Objection, form.

10 A Sorry, could you repeat that question,
11 please?

12 Q Sure. It's more than halfway down. There
13 is this -- the process for identifying license
14 plates would have been equally applicable to
15 Laganieri '363's facial recognition aspect.

16 Do you see that?

17 A Yes.

18 Q What do you mean by the phrase "the
19 process for identifying license plates" here?

20 A So, what I'm talking about is what's
21 before that in this paragraph, which is that
22 Laganieri '363 provides some examples of

1 pre-processing to reduce bandwidth, such as
2 reducing the resolution of frames, but it doesn't
3 limit the pre-processing to any particular method.

4 So, for example, Laganiere '363 also
5 discloses transmitting only one, or a few, frames
6 have suitable quality relative to the other
7 frames. And later discarding some of the sent
8 frames to reduce the bandwidth in the data.

9 So, that's an example of the process that
10 could be applied to facial recognition, because a
11 face will probably be in multiple frames, and that
12 only one, or a few, frames, having suitable
13 quality relative to the other frames would have to
14 be transmitted and taken as a whole. A person of
15 ordinary skill would understand that that's what
16 Laganiere '363 is teaching.

17 So -- so, that's an example of part of the
18 process, where instead of sending a whole, you
19 know, three seconds, say, of a face in a video,
20 it's only one, or a few frames, having suitable
21 quality relative to others that need to
22 be -- that -- that are disclosed as being

1 transmitted. And so -- so, it's that process that
2 is described generally and specifically with
3 respect to suitable license plate image that could
4 be applied to facial recognition.

5 Q Does this process of identifying license
6 plates is the same as selecting a suitable
7 processing engine at the end of this sentence?

8 MR. MARANDO: Objection, form.

9 A Well, I mean, Laganiere '363 has -- has
10 teaching that this video analytics 3 is the one
11 performing facial recognition.

12 And that's in conjunction with -- with --
13 at the end of paragraph 30 of Laganiere '363,
14 talking about how video analytics engine 1, 120,
15 determines a number of people within the data
16 frame.

17 Video analytics 2 detects loitering
18 behavior within a data frame, and video analytics
19 3 performs facial recognition.

20 And so -- so, it's -- it's analogous to
21 the example where video analytics 2 is detecting
22 vehicle license plate within the data frame that

1 you only send the best frame, or only one, or a
2 few, frames having suitable quality relative to
3 the other flames of the license plate, but
4 applying that to face recognition would be still
5 reducing the amount of data but only transmitting
6 one, or a few, frames having suitable quality of
7 the face for facial recognition relative to the
8 other frames.

9 Q Does that mean the source of the camera
10 have the option to select from the video analytics
11 engine 120 to 124 at the camera side?

12 MR. MARANDO: Objection, form.
13 (Witness reviewing documents.)

14 A I mean, if you're asking with respect to
15 claim 1.5.1, I'm not addressing that directly, but
16 I do want to point out that Laganriere '363, for
17 example, in paragraph 35 talks about how it's the
18 central server 108 has access to a plurality of
19 different video analytics engines which may be
20 selected individually for performing the
21 additional video analytics processing with
22 pre-processed video data.

1 And that's, at least, part of what
2 Laganiere '363 addresses that question you asked
3 about.

4 But this claim element is more directed to
5 ranking claim element 1.5.1, ranking by the object
6 detection system according to factors and listing
7 the factors.

8 And that's what this analysis in this
9 section is that we're talking about.

10 Q Thank you, Dr. Houh. The rankings step
11 that the detection step of -- performed by the
12 object detection system, right, in 1.5.1?

13 A I mean, 1.5.1 requires wherein the image
14 data corresponding to objects of interest detected
15 by the object detection system are ranked by the
16 object detection system according to factors
17 including close -- and it goes on to list the
18 factors.

19 But the ranking is done by the object
20 detection system as the claim -- the claim element
21 requires that the ranking are done by the object
22 detection system here.

1 Q If the process is applied to the facial
2 recognition, as you stated in paragraph 101 here,
3 would that mean the first video analytics
4 selecting frames with suitable quality for facial
5 recognition and transmitting only those frames?

6 MR. MARANDO: Objection, form.

7 A It didn't sound like a complete question
8 to me. Could you repeat that, please?

9 Q Sure. So, because you're in paragraph
10 101, we were talking about the process of
11 identifying license plate would have been equally
12 applicable, right, to the facial recognition.

13 So, my question is: If that process is
14 applied to the facial recognition, as you stated
15 here, would that mean the first video analytics
16 selecting frames with suitable quality for facial
17 recognition and transmitting only those frames, is
18 that, you know, meet that quality standard?

19 MR. MARANDO: Objection, form.

20 A I -- I still don't understand the
21 question. It didn't sound like a question.

22 Q Okay. So, you were saying the facial

1 recognition process for identifying a license
2 plate could be applied in the facial recognition
3 by selecting this suitable process engine from
4 this available analytics engines 120 to 124,
5 right? You see that?

6 (Witness reviewing document.)

7 MR. MARANDO: Objection, form.

8 A I mean, I do see where I say that in the
9 end of paragraph 101, but the key part of 101 with
10 respect to the claim itself is that Laganiere '363
11 is teaching that you are selecting one, or more --
12 one, or a few, frames have suitable quality
13 relative to the other frames.

14 And I think a person of ordinary skill in
15 the art would understand that is -- these are the
16 better one, or more, or a few frames, with respect
17 to the quality for suitability for later
18 submission to the video analytics engines to do
19 the facial recognition. But -- but that is how
20 the -- the video source side is -- is deciding
21 what frames to transmit to the -- to the server
22 side.

1 And so -- but it's -- it's showing how you
2 are using picture quality, for example, which is,
3 you know, the better of the frames that have a
4 license plate, or a face, that in you're only
5 transmitting the one, or few frames, that are --
6 really better quality relative to the other
7 frames.

8 So, that is -- is picking up one or a few
9 frames that are -- are -- are deemed better than
10 other frames that are not selected to be
11 transmitted.

12 And so that's -- and then later -- but
13 when submitted to the server, the server can
14 determine which -- which analytics engine on the
15 server side is appropriate and, you know, as -- as
16 we were looking at the Laganriere '363, there is
17 some that detect loitering, some that detect how
18 many people, and some that perform facial
19 recognitions of some of the video analytics
20 engines.

21 But with respect to this claim element
22 1.5.1, I'm showing how Laganriere '363, in

1 combination with Laganiere '817, disclose or
2 suggest this limitation, and this is part of my
3 analysis.

4 And part of it is that Laganiere '363 is
5 teaching how you only take one, or a few frames,
6 based on the quality that are better than the
7 others to submit to the -- to the server side, and
8 transmit to the server side.

9 Q So, I'm trying to understand, is it the
10 first video analytics engine in the Laganiere '363
11 that's making the selection?

12 MR. MARANDO: Objection, form.

13 (Witness reviewing document.)

14 A With respect to paragraph 101 of my
15 declaration, if you're asking about the -- it's
16 the first video analytics engine that is being
17 discussed in paragraph 41. And that's the one
18 that selects -- that's the one described in 41,
19 for example, if you look about half -- a little
20 above halfway down in paragraph 41, it says:
21 Optionally, the first video analytics selects a
22 frame with a suitable license plate image; thus,

1 bandwidth is reduced since only one, or a few
2 frames, having a suitable quality relative to
3 the other frame is transmitted.

4 And that's talking about the first video
5 analytics engine which is on the video source
6 side. And that's discussing how the video source
7 side, which is where I've mapped object -- sorry,
8 the object detection system earlier, you know, I
9 think in 1.2, and that's the one that's -- that's
10 the video -- that's an example given Laganier
11 '363 of the object detection system. And that's
12 the first -- that's where the first -- that's
13 where the video analytics is.

14 So, the first video analytics in Laganier
15 is siding on a frame with one, or more, frames
16 with better quality relative to the other frames.

17 And so that's an example of the support
18 for why Laganier '363, and then in combination
19 with the Laganier '817, discloses this claim
20 element.

21 Q So, the selection by the first video
22 analytics engine, that selection happens before

1 transmission, right?

2 A That's -- that's what Laganiere '363 is
3 teaching in, for example, paragraph 41, because
4 it's -- it's only a few frames that are
5 transmitted by the video source to the central
6 server. One or a few frames.

7 So, that's the video source side deciding
8 which one, or a few, frames have better quality
9 than the other frames. That's how it decides
10 which ones to actually transmit.

11 Q Thank you. Let's go to the next
12 paragraph, paragraph 102, on the next page.

13 Was the understanding that the first video
14 analytics selects frames with the better quality
15 and only transmits those to the next, you know,
16 engine, to the WAN network. Why does the
17 declaration then say here Laganiere '363 does not
18 expressly disclose how the data is selected? What
19 do you mean by that?

20 MR. MARANDO: Objection, form.

21 A Well, Laganiere -- well, Laganiere '363,
22 while it does say how only one or a few frames

1 having a suitable quality relative to the other
2 frames is transmitted, it doesn't give details,
3 and especially not with respect to how metadata is
4 used on the service side.

5 So what I'm saying here is that a POSITA
6 would have looked to other disclosure by
7 Laganiere, such as the Laganiere '817, that -- for
8 specifics on implementing the transmission of
9 reduced number of high-quality data.

10 And then I go to describe how Laganiere
11 '817 talks about that with respect to faces.

12 Q So, let's still stay in paragraph 102 for
13 another minute.

14 Here we are talking about the source end,
15 right? Not the server?

16 We're talking about the (indiscernible)
17 itself is making the selection and then
18 determining which data has better quality and then
19 transmit those better quality images?

20 MR. MARANDO: Objection, form.

21 A Well, the claim element 1.5.1 is focused
22 on the video source side, but what I'm doing here,

1 I think, is setting up the discussion for later
2 elements that require certain things to occur on
3 the server side, because this is -- because I
4 think I refer back to here. This is just laying
5 the groundwork for the combination with Laganieri
6 '817 with Laganieri '321.

7 Q Okay. Thank you.

8 So, let's talk about Laganieri '817. What
9 is a face log in the disclosure of Laganieri 817?

10 (Witness reviewing document.)

11 A Well, the face log in -- in Laganieri '817
12 is something that contains only images of
13 sufficient quality to perform facial recognition
14 because images below a certain quality threshold
15 are deleted from the log.

16 And Laganieri '817 explains stuff about
17 that. And I provided some citations in this
18 analysis section to the Laganieri '817.

19 Q Does Laganieri '817 create this face log
20 camera at the camera source end of the -- create
21 this face log on in the server, on the server
22 side?

1 MR. MARANDO: Objection, form.

2 (Witness reviewing document.)

3 A So, in the combination that I'm setting
4 forth that would have been obvious to a POSITA, a
5 POSITA would have been motivated to use a
6 Laganiere '817's face log in Laganiere '363 to
7 reduce the amount of data sent to Laganiere '363's
8 central server, and to ensure that only
9 high-quality images are sent for subsequent facial
10 recognition.

11 And so that's -- that's that combination
12 which is taking the 817's teaching about the face
13 log and applying it on the video source side to
14 reduce the amount of data sent to Laganiere's
15 central server. So that's the combination I'm
16 analyzing.

17 Q Thank you, Dr. Houh. Let's step back a
18 step.

19 In Laganiere '817, is the face log created
20 by the server after acquiring all the images,
21 videos from the source?

22 MR. MARANDO: Objection, form.

1 A I don't remember the specification of '817
2 Laganiere from memory.

3 If you -- is there something you want to
4 direct me to? You just want me to look through
5 the '817 and see it what it says about that?

6 Q Yeah, sure. We can look at '817, but I'm
7 just reading your declaration about, you know,
8 paragraph 102, 103 and 104. Right? Just talking
9 about the Laganiere '817 in the paragraphs, I
10 believe.

11 A Well, I mean in 102 -- or 103, 104, 105, I
12 am talking about the face log in Laganiere '817,
13 but what -- but -- but the combination would have
14 to been obvious to a POSITA would be to have --
15 using -- using that face log in Laganiere '363 to
16 reduce the amount of data transmitted to the
17 central server. And that would be on the video
18 source side.

19 And that's -- that's how a person of
20 ordinary skill would have been motivated to use it
21 to reduce the amount of -- of data transmitted
22 over the network without reducing the ability to

1 perform facial recognition.

2 And so that's the combination that -- that
3 I'm say would have been obvious to a POSITA for
4 the reasons that I give both there, and elsewhere,
5 in my declaration.

6 But I am talking generally about the face
7 log of Laganiere '817, because that provides a
8 detailed method of how -- how to select and
9 identify the images to keep in the face log.

10 And it would have been those images that
11 would have been transmitted in the system of the
12 Laganiere '363 to the central server.

13 Q I understand that part.

14 I think my question here, though, is in
15 the Laganiere '817, you created -- I mean, not
16 you -- disclosure creates the face log after
17 analyzing the video directly from the source
18 cameras.

19 And then, like you said, they determine
20 whether to keep -- purge some pictures from the
21 face log.

22 Why does the system in Laganiere '817 want

1 to communicate or transmit the face log to anyone
2 else?

3 MR. MARANDO: Objection, form.

4 A I mean, I don't know what the
5 inventors -- Laganiere was thinking. I'm really
6 analyzing the teachings in the specifications of
7 the '817 and '363.

8 And '817 provides a way of -- provides a
9 face log. It describes how it's created. It
10 describes how the faces are deleted. Why faces
11 would be added.

12 And you end up with high-quality images
13 suitable for facial recognition in the face log.

14 And it's that particular teaching that
15 could have been -- that a person of ordinary skill
16 would have been motivated to apply the Laganiere
17 '363 system to determine what images to send the
18 central server.

19 It's -- it's the '363 patent that's
20 teaching -- transmitting one or a few frames that
21 are better quality than others to the central
22 server for further analysis.

1 And it's the teaching of the face log that
2 a POSITA would have recognized would have been
3 applicable in the system of '363 to reduce the
4 amount of data transmitted to the central server
5 using the method of face log for facial
6 recognition applications, which I think Laganiere
7 '363 does discuss as well.

8 Q So, is the facial recognition performed
9 before or after the face log is created?

10 MR. MARANDO: Objection, form.

11 A In the combination of the Laganiere '363
12 and '817 analyzing and proposed -- the proposed
13 combination which is motivated -- would have been
14 motivated, a POSITA would have been motivated to
15 make for the reasons I've laid out.

16 You know, the '363 talks about the video
17 analytics performing facial recognition that on
18 that video analytics engine on the server side,
19 but it's the Laganiere teaching in the '817 that
20 teaches this face log, which -- which shows how to
21 keep the best quality images suitable for facial
22 recognition. And it's the '363 that provides how

1 it transmits one, or a few, of the better quality
2 frames that '363 doesn't specifically give
3 details -- methods particularly with respect to
4 the faces. But the '817 patent does that.

5 And it's the combination of the '363 and
6 '817 that I am saying here renders obvious this
7 claim element 1.5.1. Because a person of ordinary
8 skill would have recognized and looked to the
9 Laganiere '817, and looked to the face log, to see
10 that it's an applicable way on the video source
11 side determining the one, or few, frames of the
12 faces that are the best quality to submit to the
13 central server.

14 Q Does that require the source end to have
15 the computation power to create the face log?

16 MR. MARANDO: Form.

17 A Well, in the combination, the face log key
18 creation and decision of which -- which faces are
19 the best to submit to the server are done on the
20 video source side.

21 So, I mean, I don't know what would be
22 required but it's -- I think a person of ordinary

1 skill would have been motivated to make this
2 combination for the reasons that I've given in
3 this section, including that, you know,
4 both -- both Laganiere '817 and '363 are -- well,
5 I say in 108: They also both seek to reduce the
6 amount of data transmitted over networks without
7 reducing the ability to perform facial
8 recognition, and that a POSITA would have
9 understood that Laganiere '363 and Laganiere '817
10 were combinable, and would have been motivated to
11 combine them.

12 And then I go on to talk about further
13 reasons why a POSITA would have been motivated to
14 combine them in paragraph 109 as well.

15 Q Thank you.

16 MR. MARANDO: Should we take a short
17 break?

18 MR. TAN: Yes. Let's finish one more
19 question about this 107, and let's take a quick
20 break.

21 Q So, in probably 107, the first sentence
22 says: Laganiere '363 describes detecting objects

1 in image and video data, example faces, and
2 sending only high-quality image data through the
3 central server.

4 What do you mean by "high-quality image
5 data" here?

6 A Well, what I'm citing to Laganier '363,
7 paragraph 41, and it talks about submitting, for
8 example, a frame having a suitable quality
9 relative to the other frames, which means that
10 it's suitable for the purpose, which is it's
11 suitable for the downstream analysis, such as
12 license plate detection or facial recognition.

13 And so I'm saying here that it's that --
14 that quality level with respect to other frames
15 which might not have enough quality as it's saying
16 here in paragraph 41 of Laganier '363.

17 Q So the high-quality image is the suitable
18 quality relative to other frames in paragraph 41?

19 A But it's also suitable for the task of,
20 say, facial recognition or license plate
21 recognition. And that would be the level of
22 quality required in order to perform that analysis

1 properly, for example.

2 MR. TAN: Thank you. Let's take a break.

3 (Off the record.)

4 BY MR. TAN:

5 Q So, Dr. Houh, did you talk to anyone about
6 the deposition during the break?

7 A No.

8 Q Thank you. Next still go back to the
9 declaration. Let's go to page 58, 1.5.3.

10 A Okay.

11 Q So here look at paragraph 114, towards the
12 bottom of page 58, it states: It would have been
13 obvious to a POSITA combining the teachings of
14 these references for the central server to start
15 with the highest quality images when performing
16 facial recognition.

17 Do you see that?

18 A Yes.

19 Q What is highest quality, or what are the
20 quality images are you referring to here?

21 (Witness reviewing document.)

22 A So, Laganieri '817 teaches that there is a

1 quality score for each of the faces in -- for the
2 face log and that faces -- face images from the
3 face log which are below a minimum quality score
4 are purged. That's, for example, taught in
5 Laganier '817 in column 2, lines around 46 to 50.

6 And so the metadata there includes the
7 quality score for each of the faces in the face
8 log. And it's obvious to start with the quality
9 score that is the highest score of -- according to
10 the metadata as disclosed in Laganier '817.

11 Q I understand that the '817 Laganier
12 discloses the quality score in the section you
13 just mentioned, but I don't see the highest
14 quality of highest quality score mentioned here.

15 Can you explain why the central server
16 would start with the highest quality images?

17 A Well, I think it would have been obvious
18 to a person of ordinary skill that you would start
19 with the highest quality, because, one, for
20 example, that would include the highest quality
21 score would probably give you the best chance for
22 the best identification. So a highest -- a

1 high -- and that's score. So it's obvious to
2 start with the highest score image in the face
3 log. That's what I'm saying here.

4 Q So, in that system, combining both '361
5 Laganieri and '817, the system, the combine system
6 would still try to perform the facial recognition
7 and starting with the highest quality image from
8 the face log; is that right?

9 A Yeah, in combine teachings of these
10 references, it would have been obvious to a POSITA
11 to start with the highest quality image, which
12 would be the one with the highest quality score
13 as -- as taught by Laganieri '817.

14 Q Let's goes to 115 on the next page. The
15 first sentence talks about '817 Laganieri
16 discloses further purging lower quality images
17 from the face log.

18 Was the purging disclosed here happens
19 after the face log is associated with an
20 individual?

21 MR. MARANDO: Objection, form.

22 A By the way, just to add to something, an

1 answer earlier, I was looking at the '817. And if
2 you look all column 1, lines 24 to 26, it says
3 here: High-quality images are important because
4 they maximize the probability that an individual
5 be correctly identified. So I just wanted to add
6 that disclosure to an earlier question of mine --
7 answer of mine.

8 Sorry, I'm looking for your -- address
9 this question, your current question now.

10 Q Thank you.

11 (Witness reviewing document.)

12 A Look at column 4, around -- starting
13 around line 20, in the -- sorry -- Laganiere '817,
14 it talks about how, face detection and face
15 tracking are executed by the CPU 112 from code
16 stored in the memory 114.

17 The face detection and tracking module 130
18 may be further divided into skin segmentation 132
19 and background segmentation 134, for analyzing the
20 video frame and determining where the individual's
21 space is visible in providing face images to
22 quality analysis module 104.

1 In object tracking 136 for tracking
2 movement of a candidate region between frames
3 within the video sequence. The quality analysis
4 module 140 analyzes the face image to assign a
5 quality score to the image and to determine if it
6 is suitable quality for storage in the face log.

7 Modules for assessing criteria are
8 relative to the face image are provided.

9 The modules for determining criteria
10 include, but not be limited, to pose estimation
11 142 for determining orientation of the image,
12 illumination quality 144 for determining dynamic
13 range and evenness, sharpness 146, skin content
14 148, for determining the amount of human skin in
15 the image and image resolution 150.

16 Each module can determine a score for one
17 or more criteria. In addition, it should be
18 understood that the functions provided by the
19 modules shown may be combined or divided depending
20 on a particular system configuration.

21 For example, the face detection and
22 tracking may be performed by separate dedicated

1 systems or implemented in separate modules.

2 So, what it's saying here, it's not in
3 this example given in the Laganiere '817. It's
4 simply looking for any faces and gauging the
5 quality before adding it to the face log.

6 It's not, in this particular
7 example -- there is no prior determination that
8 the face belongs to an individual.

9 It just generally talking about tracking
10 individual faces within the video frame and adding
11 them to the face log if the quality is sufficient.

12 Q Thank you, Dr. Houh.

13 In paragraph 115 in your declaration,
14 that's relied on section 10, lines 50 to 54,
15 right?

16 A I do cite 10, 50 to 54 there, but that's
17 with respect to purging lower quality images from
18 the face log.

19 Q Okay. I just want to make sure we are on
20 the same page about this, this part.

21 So let's move to paragraph 116.

22 A By the way, could I just add a little bit,

1 if you look earlier in that paragraph, it talks
2 about on line 50 -- 37, each member of the group
3 may be stored in an individual face log or they
4 may be stored as group or global face log.

5 So it's clear that there are some face
6 logs associated with individuals but some face
7 logs that are global.

8 And so with respect to what I pointed out
9 earlier, there was no disclosure that it be
10 individualized first in that section from
11 column 4.

12 Q Where is the global face log you just
13 mentioned?

14 A Yeah, line 39 of column 10. That's not
15 the only place it talks about the global face log,
16 I think.

17 Q What is a global face log here that you
18 refer to here in line 39 of column 10?

19 A Well, it's in contrast to an individual
20 face log.

21 Laganriere '817 talks about face logs that
22 are for an individual, and then -- then these

1 global face logs which can contain facial images
2 and quality scores for many different individuals.

3 Q No matter if it's global or group face log
4 of individual face log, would you agree that the
5 face log needs to be created and associated with
6 the individual or group, and then to purge, reduce
7 the size of the face log?

8 MR. MARANDO: Objection, form.

9 A I mean, there are portions of the
10 Laganier '817 specification that talk about
11 purging the face log generally, not being specific
12 about whether the face log is individual or global.

13 For example, the abstract, the last few
14 lines of the abstract say that the quality score
15 is associated with the face image, enabling the
16 face log for purged so that only high-quality face
17 images are contained in the log.

18 It also says that in column 2, line 39 to
19 40. It says: Wherein, the face log is
20 periodically purged based on the score of the
21 acquired images.

22 So it's clear that that purging teaching

1 is talking generally about the images in the face
2 log, whether it be individual or global.

3 Q Okay. Thank you.

4 Let's go to paragraph 116, just below the
5 previous paragraph on the same page, 59 (as said).

6 In the last sentence here the declaration
7 states that -- just one sentence, paragraph (as
8 said).

9 The last part of this paragraph, it
10 recites: Laganiere explains for a similar system,
11 the central server controls a process for
12 selectively erasing portions of video data that
13 are stored in the video storage device based on
14 the result of video analytics processing of the
15 video data.

16 Do you see that?

17 A Yes.

18 Q What do you mean by based on result of
19 video analytics processing here in the last --
20 last part?

21 And you have opened '461 Laganiere. That
22 is part of 10.

1 A Thank you.

2 Well, I mean, that's really, kind of,
3 support for what I'm saying. It would have been
4 obvious for a POSITA to reduce the number of
5 images in the central server because -- and why
6 generally, you know, to the extent the Laganiere
7 '363 and Laganiere '817 combination does not
8 expressly disclose that the central server purges
9 images from the face log.

10 It's that a POSITA would have found it
11 obvious to reduce those images in the central
12 server, because Laganiere is explaining in the
13 '461 in paragraph 10 that, essential server
14 controls a processor selectively erasing portions
15 of video data that are stored in the video storage
16 device based on a result of video analytics
17 processing of the video data.

18 So, it's expressing a desire to purge data
19 at the central server, and to the extent that
20 Laganiere '363 and Laganiere '817 combined do not
21 disclose that it's the central server that purges
22 images from the face log.

1 Q Doesn't that also mean the '461 disclosure
2 is actually performance of the selectively erasing
3 action at the end of the video analytics?

4 MR. MARANDO: Objection, form.

5 A So, the Laganiere '461 also discloses that
6 video analytics are done both at the source end
7 and at the server end.

8 For example, if you look at figure 4, item
9 402, it talks about perform video analytics at the
10 source end, and then if you look at...

11 Q Which reference are you looking at,
12 Dr. Houh?

13 A Laganiere '461 application.

14 It does talk about under -- in paragraph
15 9, under control of the central server performing
16 video analytics on the portion of the video data.

17 And so, it -- the Laganiere '461 also
18 talks about video analytics, both on the source --
19 video source side and the server side.

20 And so with respect to the results of
21 video analytics processing of the video data, that
22 is not specific about -- about -- it could be

1 after the source side video analytics, because
2 Laganriere '461 discloses video analytics both on
3 the source side and on the -- under control of the
4 central server.

5 Q How do we know that the video analytics is
6 performed at the source end?

7 MR. MARANDO: Objection, form.

8 A Well, I mean, paragraph 9, with respect to
9 video -- some video analytics on the -- under
10 control of the server side, it's figure 4 of the
11 Laganriere '461 application, in box 402, that talks
12 about performing video analytics at the source
13 end.

14 So, that's how you know that Laganriere
15 '461 also talks about video analytics, both at the
16 source end and under control of the server, very
17 similarly to the way Laganriere '363 talks about
18 first video analytics and second video analytics.

19 Q Thank you. Also, for the term used under
20 control of server, that's -- does that mean
21 performed by the server or by something else?

22 MR. MARANDO: Objection, form.

1 A If you look at the bottom of paragraph 17
2 in the Laganiere '461 reference, it talks about
3 how in the system shown in figure 1, central
4 server 108 comprises one, or more, processors for
5 performing video analytics processing of video
6 data that is provided by the video source 102 via
7 WAN 106.

8 And that's similarly similar to an
9 optional alternative or, you know, an embodiment
10 in -- in -- called out in the Laganiere '363,
11 which talks about similarly the server 108
12 comprising processors performing video analytics.

13 I'm not sure of the exact wording, but we
14 talked about that earlier, and I pointed that
15 disclosure out in the Laganiere '363.

16 But the Laganiere '461 says here: The
17 central server comprises one or more processors
18 for performing video analytics.

19 So, that's part of the central server in
20 this example in figure 1.

21 Q Going back to my original question,
22 Dr. Houh, would you agree that the selectively

1 erasing in box 410, in figure 4, happens after the
2 first video analytics at the source end and the
3 second video analytics under the control of
4 central server.

5 MR. MARANDO: Objection, form.

6 A If you look at paragraph 15, figure 4, is
7 just an example embodiment of the invention.

8 And figure 4 does have two video analytics
9 steps listed in the flow chart. One, 402 which is
10 video analytics of the source.

11 And one at 408, which is video analytics
12 under control of the central server, which, as we
13 saw, there are video analytics processors at the
14 part of the central server.

15 And then 410 talks about selectively
16 delete portions of stored video data under control
17 of central server.

18 And so, so, it's... and that's described
19 in paragraph 25 at 410 under control of the
20 central server 108, portions of the retrievably
21 stored portion of the video data, which are other
22 than the identified subset of the portion of video

1 data are deleted from the memory storage device.

2 That's in paragraph -- towards the bottom
3 of paragraph 25.

4 And so figure 4 is describing purging data
5 at the central server but not with respect to in
6 relation to any particular video analytics. It's
7 after both video analytics steps in the example
8 flow chart in figure 4, but it doesn't
9 specifically say in that box 410 anything about
10 video analytics.

11 Q Okay. Thank you.

12 Let's go back to the declaration. Let's
13 go paragraph 169 of the declaration. That's on
14 page 81.

15 A Okay.

16 Q So, in the second sentence, the
17 declaration states: Chen discloses reliably
18 performing a facial recognition process by
19 performing quality assessment on an initial set of
20 images; do you see that?

21 A Now I see initial set of images, but I
22 don't remember what you said around that.

1 Q I'm just reading the sentence.

2 A Okay. I mean, I see the initial set of
3 images about 5 lines into 169.

4 Q What do you mean by "initial set of
5 images" here?

6 (Witness reviewing document.)

7 A So, if you look at Chen paragraph 90, it
8 talks about there's a work flow for face
9 recognition system, and the work flow comprises a
10 set of capture images, such as video frames that
11 have satisfied a face detection set and have been
12 normalized as described above.

13 This set of captured face images is then
14 assessed for image quality according to the
15 methods described above.

16 And based on the result of the quality
17 assessment, the face images are selected resulting
18 in a subset of face images.

19 So, what I'm referring to here about
20 initial, a set of images, or just all the ones
21 that have passed this face detection test, and
22 normalized, and so it's from that set that you

1 perform -- Chen talks about performing image
2 quality assessment.

3 And then based on the result of the
4 quality assessment, the face images selected
5 resulting in a subset.

6 So the initial -- the initial set of
7 images would be all the images that pass the face
8 detection test and have been normalized.

9 And from that group, the quality -- Chen
10 describes assessing for the image quality, and
11 then selecting a subset of those. So that's what
12 that I mean by "initial" there.

13 Q Does Chen also apply performing image
14 quality assessment on the other sets after the
15 initial set?

16 MR. MARANDO: Objection, form.

17 A Could you repeat the question, please?

18 MR. TAN: Ms. Court reporter, could you
19 repeat the question?

20 (The requested portion of the record was
21 read by the reporter at 2:54 p.m.)

22 MR. MARANDO: Objection, form.

1 A I'm not sure how to answer the read-back
2 question with indiscernible words as part of the
3 question.

4 Q Which word were you referring to?

5 A I think the court reporter had some
6 indiscernible words as part of the readback that
7 were just read back as "indiscernible;" at last
8 that's how I took it.

9 MR. TAN: Thank up.

10 Karen, which word you didn't get in the
11 first half.

12 (The court reporter read testimony.)

13 MR. TAN: Thank you. That's image quality
14 assessment.

15 MR. MARANDO: Objection, form.

16 THE WITNESS: Could I get the whole
17 question read back, please, again?

18 (The requested portion of the record was
19 read by the reporter at 2:56 p.m.)

20 MR. MARANDO: Objection, form.

21 A I -- I am using Chen with respect to a
22 combination of Chen and Laganieri '363, '817, and

1 optionally '461, really for the requirements of
2 claims 4 and 16. And that's the analysis that I
3 perform with respect to Chen.

4 And I don't think those -- those elements
5 require what you ask in your question. But I did
6 analyze Chen for what it disclosed with respect to
7 elements -- claims 4 and 16 and 6.

8 Q So, is it your opinion that Chen does not
9 perform facial recognition process by performing
10 image quality assessment on data sets, image sets
11 that's not the initial set?

12 MR. MARANDO: Objection, form.

13 A I mean, the combination I'm analyzing is
14 with respect to using Chen's algorithm of facial
15 recognition which is, for example, work flow 600
16 of a facial recognition system in Laganriere's
17 363's video analytics engine 124, to reliably
18 perform a facial recognition process, and to
19 successfully determine the identity of the person.

20 With respect to this ordering of
21 operations that -- in your question, I don't think
22 that's -- that's not part of my written analysis

1 as it pertains to claims 4 and 16 and claim 6,
2 because I don't think there is a requirement about
3 that ordering that you asked about in those claim
4 elements -- those claims, or claim elements as a
5 dependent from claim 1.

6 Q So, you don't have an opinion on whether
7 or not the facial recognition process is performed
8 on the other data sets that's not the initial set;
9 is that right?

10 MR. MARANDO: Object to form.

11 A Well, my written opinions are with respect
12 to wherein the video analytics system includes an
13 object analysis system that analyzes the image
14 data, corresponding to objects of interest
15 detected by the object detection system by
16 comparing the image data, the reference images to
17 identify the objects of interest by recognizing
18 patterns in the image data, and/or by applying
19 image processing functions, neural network
20 functions, deep-learning functions, and/or object
21 classification functions to the image data. And
22 that's claims 4 and 6.

1 And wherein the image data corresponding
2 to objects of interest detected by the object
3 detection system are compared by the video
4 analytics system to reference images to identify
5 the objects of interest.

6 And that's -- that's what my opinions are
7 with respect to in my declaration.

8 They are not really directed to this
9 ordering or subset or initial image data set that
10 you asked about.

11 That part of the disclosure of the video
12 process 600, facial recognition process 600, in
13 Chen has part of that in the description.

14 But my analysis and written opinions are
15 with respect to those claim elements, or claims 4,
16 6 and 16.

17 Q Look at video 6 of Chen. And would you
18 agree that the selection of image in box 606 is a
19 part of Chen's work flow 600?

20 A Well, in figure 6, which is just one
21 illustration of a work flow, 600, there is a box
22 that says "box 606," that says "select/filter face

1 images."

2 What I'm relying on in Chen is the part of
3 the process really that are germane to claims 4, 6
4 and 16, but comparison of -- of comparing receive
5 subset of face images to gallery images to
6 determine how well the face is aligned across two
7 sets of images.

8 And based on most suitable face matching
9 process selected to determine the identity of the
10 person at operation 620.

11 And so it's the disclosure of Chen
12 disclosing comparing a subset of face images 608
13 to gallery images, which are reference images, as
14 claimed, to determine the identity of the face.

15 And that's similar to what I rely on
16 (indiscernible), which, if you look at paragraph
17 176 and 172, that's -- that's what I'm focusing on
18 Chen for.

19 And there is a box -- I'm not going to
20 deny that box 606 is there in figure 6.

21 Q I'm trying to understand if Chen already
22 select a performance selection of face images in

1 606, why should a POSITA look at the other places,
2 you know, to do more selection?

3 MR. MARANDO: Objection, form.

4 A I'm not sure what other places you're
5 referring to.

6 Q I mean, look at the other Laganiere '363
7 to do the selection.

8 MR. MARANDO: Objection, form.

9 A I'm not sure why you think they would have
10 to be mutually exclusive in that case.

11 There is a process that is -- is
12 selecting -- you know, based on the algorithms
13 disclosed in Chen, there could be the useful 606
14 select filtering step that could be applied still,
15 even if images were already selected on another
16 level. But it's really the -- the -- the part of
17 the process 600 in Chen, really, I'm focusing on
18 are the comparison with the reference image that
19 Chen explicitly teaches.

20 And I've shown why a person of ordinary
21 skill would have made the combination of Chen with
22 the other Laganieres.

1 MR. TAN: Let's take another ten-minute
2 break.

3 (Off the record.)

4 BY MR. TAN:

5 Q Dr. Houh, have you talked to anyone about
6 your deposition during the break?

7 A No.

8 Q Thank you. Let's go to page -- to page 86
9 of your declaration.

10 A Okay.

11 Q On the top of page 86, there is annotated
12 figure 1.

13 Did you make this drawing?

14 MR. MARANDO: Objection, form.

15 Q Did you add the annotations to the
16 drawing?

17 A I don't think I did, but these are all my
18 opinions and I stand by them.

19 Q What does the red color mean here? There
20 are four boxes and one irregular box.

21 MR. MARANDO: Objection to form.

22 A It is describing method 150, highlighted

1 in red.

2 Q Is the method 50 implemented on the server
3 side or on the source side?

4 (Witness reviewing document.)

5 A If you look at the end of paragraph 197, I
6 say there, at least for that analysis in that
7 section: That method 150 is implemented using
8 server 306 depicted in figure 3.

9 Q You mean 197 of your declaration?

10 A Sorry. That's at the end of paragraph of
11 90 -- 197, on page 98, of my declaration.

12 Q Go back to page 86. It talks about the
13 method 200, optionally performed following method
14 50.

15 Do you see that in the first sentence of
16 paragraph 181?

17 A Yes, I do.

18 Q Is this method 200 also performed by the
19 server 306?

20 A So, if you look at the description of
21 figure 3, which is described as one example
22 embodiment, if you look at column 8, lines 20

1 through 22, it talks about how one particular
2 server 306 executes image capturing and processing
3 software, such as software that implements one or
4 both of the methods 150 and 200.

5 And I cite that in paragraph 194 of my
6 declaration as well.

7 Q Thank you.

8 On page 87 there is this annotation in
9 figure 2 the middle; do you see that?

10 A Yes.

11 Q In the highlighted blue box and purple
12 box, there is this long box with the label 230,
13 submit image to image queue.

14 What is an image queue here?

15 MR. MARANDO: Objection, form.

16 (Witness reviewing document.)

17 A So, if you look at column 7, of Bedros, at
18 line 19, it talks about this queue, and what can
19 be done with the queue. And the queue is
20 basically just a line that -- that you can wait
21 in, or images are placed in.

22 But this describes following processing of

1 the optional processing layer 220, the method 200
2 includes submitting 230, the facial recognition
3 116, to the facial image queue. In some
4 embodiments submitting 230, the facial image 116
5 to the queue may include removing and reordering
6 facial images 116 within the queue, awaiting
7 submission to the facial recognition program based
8 on processing outcomes within the optional
9 processing layer.

10 So this queue holds facial images that are
11 awaiting submission to the facial recognition
12 program. But furthermore, the queue can be
13 reordered at points, and things can be removed
14 from the queue as well.

15 Q So, is the queue in the server 306, is the
16 queue stored somewhere at the source end?

17 MR. MARANDO: Objection, form.

18 Q In Bedros.

19 A Well, I mean there are disclosures in
20 Bedros. For example, column 8, lines 22 to 24, it
21 says: The same server 306, or one or more other
22 servers 308, execute facial recognition software.

1 So I think there are some instances
2 described where the queue is in -- in the server
3 306 because that's -- in some embodiments it's
4 describing that -- that the facial recognition
5 software can be executed on server 306, for
6 example, but those are -- there are many different
7 embodiments disclosed within Bedros.

8 Q So, is it your opinion that the queue can
9 be anywhere outside of the server or on the
10 server?

11 MR. MARANDO: Objection, form.

12 (Witness reviewing document.)

13 A If you look at paragraph 225, I do say
14 that there is a particular kind of queue
15 processing, reordering the queue as new images
16 arrive from different places, that a POSITA would
17 have understood this sort of queue progressing
18 would have taken place at server 308, a video
19 analytics system, where all quality scored images
20 would be present together for processing.

21 So that's describing a case where there
22 are multiple cameras that would have been obvious

1 to have, submitting -- all submitting images to
2 the queue.

3 And so at that point, it would have
4 been -- a person of ordinary skill would have
5 understood that, in this scenario, that this sort
6 of queue processing would have taken place at
7 server 308.

8 Q Thank you. Let's go to paragraph 210 on
9 page 104.

10 A Okay.

11 Q Did you add the work camera here to figure
12 4 above input?

13 MR. MARANDO: Objection, form.

14 A I mean, this figure is annotated, so
15 that's not -- that word is not in the original
16 figure.

17 Q So, here on this same page, 104, in
18 paragraph 210, above 54, you're pointing to the
19 server 308 as the video analytics system, and
20 server 306 as the object detection system; is that
21 right?

22 A In 210 that is -- that is a fair reading

1 of that sentence.

2 Q Is the server 306 -- would you agree with
3 me that the server 306 is not located at the
4 source of camera or camera end?

5 MR. MARANDO: Objection, form.

6 A So, if you look at the description in
7 figure 4, in Bedros, at column 8, line 50, it
8 says: Figure 4 is a block diagram of a computing
9 device, according to an example embodiment. In
10 one embodiment, multiple such computer systems are
11 utilized and distributed network to implement
12 multiple components in the transaction based or
13 service-oriented environment.

14 For example, the computing device at
15 figure 4 may be one, or both, of the servers 306,
16 308 of figure 3.

17 So I think I can agree with what you're
18 asking because it specifically says here that
19 figure 4 -- the device in figure 4 may be the
20 server 306, which is -- the -- the camera is the
21 source, and that's server 306, and in this example
22 embodiment here.

1 Q So, is that your opinion that the
2 embodiment of figure 4, the camera which is
3 annotated (indiscernible) here, is the camera
4 device that's collecting the video data to be
5 analysised (as said)?

6 MR. MARANDO: Objection to form.

7 A I mean, I am pointing out in paragraph 210
8 that it does say -- I pointed to that very line
9 that, that the computing device depicted may be
10 server 306, and that each of the computing devices
11 can be a computer 410, which includes in input
12 416, that may include a camera that connects
13 directly to the computer 410.

14 And I cite to another portion of Bedros
15 for that, and that's what I've highlighted as the
16 camera there.

17 Q Let's move to paragraph 214, underneath
18 claim limitation 1.4.2. Are you there?

19 A Yes.

20 Q The end of this paragraph, 214, you say:
21 By the time of the alleged invention, a POSITA
22 would have been well aware of the concept of

1 software as a service, SaaS, and how it could be
2 applied here to outsource facial recognition.

3 What is SaaS at the time of the invention?
4 Can you explain that?

5 (Witness reviewing document.)

6 A Well, the software, as a service, is
7 a -- generally some functional piece of software
8 that's operated by a third party, which are often
9 available for subscription, or accessed by some
10 subscription or payment system, to access these
11 features and functionalities.

12 So, I think what I'm referring to here is
13 that this facial recognition service, a POSITA
14 would have been well aware of the concept of
15 having functions like that applied to outsourcing
16 facial recognition that would be operated as
17 software as a service typically by a third party,
18 that one would pay for access to the service
19 through either an API, or some other interface.

20 Q The facial recognition service, of the
21 facial recognition SAAS, is a type of video
22 analytics function that's performed by the video

1 analytics system, right?

2 MR. MARANDO: Objection, form.

3 A I think what I'm saying here is that by
4 the time of the invention of the '321 patent, that
5 a POSITA would have been well aware that software,
6 as a service, was a well known concept at the
7 time, and -- and they would have known how it
8 could be applied here to outsource facial
9 recognition as a software as a service, and so
10 that's the point here.

11 Q Because the SAAS facial recognition
12 service is generally operated by a service
13 provider like Amazon Cloud; is that right?

14 MR. MARANDO: Objection, form.

15 A I'm -- I didn't say anything about Amazon
16 here, but I think there is a well known concept of
17 software as a service, and it could have -- a
18 POSITA would have known -- aware of that concept
19 and how it could be applied here to outsource
20 facial recognition.

21 Q Okay. Thank you.

22 MR. TAN: I don't think I have more

1 questions at this point. Let's maybe take another
2 five, ten-minute break so we can reconvene and I
3 can confer with my colleagues.

4 Would that be okay?

5 MR. MARANDO: Yeah, let's take a
6 ten-minute break.

7 MR. TAN: Thank you.

8 (Off the record.)

9 MR. TAN: I pass the witness. Thank you,
10 Doctor.

11 MR. MARANDO: We don't have any questions.
12 So we can close the deposition and the witness
13 will review the transcript.

14 (Deposition concluded at 4:04 p.m. EST

15 Signature of the witness was requested.)
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VERIFICATION OF DEPONENT

I, HENRY HOUH, Ph.D., having read the
foregoing deposition consisting of my testimony at
the aforementioned time and place, do hereby
attest to the correctness and truthfulness of the
transcript.

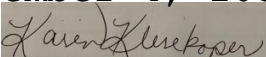
NAME: HENRY HOUH, Ph.D.

DATED:

1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2 I, Karen Klerekoper, Certified Reporter and
3 Notary Public within and for the State of Michigan
4 do hereby certify: That Dr. Henry Houh, the
5 witness whose deposition is hereinbefore set
6 forth, was duly sworn by me before the
7 commencement of such deposition and that such
8 deposition was taken before me and is a true
9 record of the testimony given by such witness.
10 I further certify that the adverse party,
11 VUSIONGROUP SA, was represented by counsel at
12 the deposition.
13 I further certify that the deposition of Henry
14 Houh, Ph.D., occurred at the office of virtually
15 on Tuesday, February 25, 2025 commencing at
16 10:36 a.m. to 4:04 p.m.
17 I further certify that I am not related to any of
18 the parties to this action by blood or marriage, I
19 am not employed by or an attorney to any of the
20 parties to this action, and that I am in no way
21 interested, financially or otherwise, in the
22 outcome of this matter.
IN WITNESS WHEREOF, I have hereunto set my had
this 27th day of February 2025.

14 My commission expires:
15 12/4/31
16 Notary public in and for the State of
17 Massachusetts
18 My commission expires:
19 December 4, 2031

17 

18
19 NOTARY PUBLIC IN AND FOR THE STATE OF
20 MASSACHUSETTS
21
22

A			
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