UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIGN TECHNOLOGY, INC.,	)	
	)	
Petition,	)	
	)	
vs.	)	No. IPR2023-01369
	)	U.S. Patent
DENTAL MONITORING SAS,	)	No. 10,755,409
	)	
Patent Owner.	)	
_____	)	

DEPOSITION OF JOHN T. MONGAN, M.D., Ph.D.
Via Zoom Videoconference
Tuesday, July 23, 2024

Reported Stenographically by:
LAURIE HELD-BIEHL
CA CSR No. 6781
IL CSR No. 084002860
NJ CCR No. 30XI00239100
TX CSR No. 8555
WA CCR No. 21020748
RPR/CRR/RMR No. 32836
JOB No. 6801299

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ALIGN - EXHIBIT 1037
Align Technology, Inc. v. Dental Monitoring SAS - IPR2023-01369

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_____	)	

Oral Deposition of JOHN T. MONGAN, M.D., Ph.D., pages 1 through 153, taken on behalf of Petitioner via Zoom Videoconference beginning at 10:11 a.m. and ending at 4:21 p.m. on Tuesday, July 23, 2024, reported stenographically by LAURIE HELD-BIEHL, California Certified Shorthand Reporter No. 6781, Illinois Certified Shorthand Reporter No. 084002860, New Jersey Certified Court Reporter No. 30XI00239100, Texas Certified

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Shorthand Reporter No. 8555,
Washington Certified Court Reporter
No. 21020748 and Registered
Professional Reporter, Certified
Realtime Reporter, Registered Merit
Reporter No. 32836.

APPEARANCES:

For Petitioner Align Technology, Inc.:
WILSON SONSINI GOODRICH & ROSATI
Attorneys at Law
BY: MATTHEW A. ARGENTI, ESQ.
BY: PATRICK MEDLEY, ESQ.
650 Page Mill Road
Palo Alto, California 94304
650.493.9300
margenti@wsgr.com
pmedley@wsgr.com
(Via Zoom Videoconference.)

For Patent Owner Dental Monitoring SAS:

GIBSON DUNN & CRUTCHER
Attorneys at Law
BY: ANDREW BLYTHE, ESQ.
3161 Michelson Drive
Irvine, California 92612
949.451.3800
ablythe@gibsondunn.com
(Via Zoom Videoconference.)

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Via Zoom Videoconference

Tuesday, July 23, 2024

10:11 a.m. - 4:21 p.m.

THE REPORTER: This is the remote deposition of Dr. John Mongan, M.D., Ph.D., in the matter of Align Technology v Dental Monitoring SAS.

Today's date is Tuesday, July 23, 2024, and the time is approximately 10:11 a.m.

Counsel, would you please identify yourselves for the record, state whom you represent, and agree on the record that there is no objection to me swearing in the witness via videoconference.

MR. ARGENTI: Matt Argenti, Wilson Sonsini, representing petitioner Align. 10:11

No objection to swearing in the witness.

MR. BLYTHE: Andrew Blythe of Gibson, Dunn & Crutcher on behalf of Dental Monitoring and the witness.

No objection to swearing in the witness. 10:11

MR. MEDLEY: Patrick Med- -- pardon me.

Patrick Medley from Wilson Sonsini representing Align.

(Witness sworn.)

THE WITNESS: Yes, I do. 10:11

THE REPORTER: Thank you very much. I'm going off camera.

JOHN T. MONGAN, M.D., Ph.D.,
having been first duly sworn
and administered an oath
pursuant to California CCP 2094,
was examined and testified as follows:

EXAMINATION 10:12

BY MR. ARGENTI:

Q Good morning, Dr. Mongan.

A Good morning.

Q Could you please state your full name for the record? 10:12

A Sure.

My name is John Thomas Mongan.

Q And where are you currently located?

A I'm currently sitting in the offices of Gibson, Dunn in San Francisco. 10:12

Q Is there anyone else in the room with you today?

A There's no one else in the room with me right now.

Q If that changes throughout the day will you 10:12

let me know if anyone else joins you in the room, please?

A I will.

Q Okay. It's my understanding that you have printed copies of your declaration and the exhibits 10:12 that it cites available to you today; is that true?

A I believe so.

Q And are those copies clean with no notes?

A To the best of my knowledge. I have not made any notes in them. 10:12

Q Okay. Do you have any notes with you?

A I do not have any notes accessible to me or open on my computer.

Q Have you given a deposition before?

A I've given a deposition before. 10:13

Q About how many times?

A One time.

Q When was that?

A It was several months ago.

Q And was that in relation to the dispute 10:13 between Dental Monitoring and Align?

A Yes.

MR. BLYTHE: Objection to form.

Sorry, just give me one minute to object.

Object to the form. 10:13

BY MR. ARGENTI:

Q I just want to make sure we get your answer there, Dr. Mongan.

A Yes. It was in relation to a matter between Dental Monitoring and Align. 10:13

Q And you were serving as an expert for Dental Monitoring in that deposition?

A Yes, I was serving as an expert.

Q So is this your first deposition in the inter partes review proceeding? 10:13

A Yes, it is.

Q And I may use the acronym "IPR" to refer to an "inter partes review."

Will you understand what I'm talking about?

A Yes, I will understand that "IPR" refers to 10:14 an inter partes review.

Q You may be familiar with how things work in a deposition from your previous experience but I'm just going to quickly go through some of the ground rules. 10:14

Do you understand that you're providing your testimony under oath and you are expected to tell the truth?

A I understand that I'm under oath and expected to tell the truth. 10:14

Q Is there any reason that you cannot provide complete and accurate testimony today?

A I'm not aware of any reason why I can't provide complete and accurate -- accurate testimony.

Q Hopefully, my questions are clear. If you do not understand my questions, please let me know that it is unclear. 10:14

Under the guidelines in this proceeding you must ask me for any clarification. If you do not tell me otherwise, I will assume that you understand the question. Okay? 10:14

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: If I have questions -- if I --

If I would like clarification about your question, I will ask for clarification. 10:14

BY MR. ARGENTI:

Q Please provide verbal answers rather than nodding your head for the benefit of the record and the reporter; okay? 10:15

A I will try to remember to provide verbal responses to all your questions. And if I -- if I do not, then I'm happy to be reminded to provide a verbal response.

Q We can take a break any time that you would 10:15

like one as long as there is not a question pending; if there is a question pending, you must answer the question before we take a break.

Do you understand?

MR. BLYTHE: Objection to form. 10:15

You can answer.

THE WITNESS: I understand that I can take a break at any time and that if there is a question pending, that I need to answer that question before the break. 10:15

BY MR. ARGENTI:

Q And we'll probably take breaks -- I would try to remember to take breaks every hour or so but if you'd like one before I suggest one, just feel free to ask; okay? 10:15

A Okay.

Q You're being compensated for your testimony in this proceeding, right?

A That's correct.

Q Your hourly rate is $800 an hour; is that right? 10:16

A Yes, that's correct.

Q Is all your compensation in this matter being paid at that same rate?

A My travel time is being paid at a lower 10:16

rate.

Q What's that rate?

A $400 per hour.

Q How much have you billed Dental Monitoring to date for your work in this IPR? 10:16

A I -- I don't know.

Q Would it be more than $50,000?

A I don't think so.

Q How much have you billed Dental Monitoring to date for all your work in the dispute with Align, 10:17 including the district court case?

A I don't know.

MR. BLYTHE: Objection. Form.

You can answer.

BY MR. ARGENTI: 10:17

Q Aside from your work for Dental Monitoring in the dispute with Align, have you ever worked as an expert in any other patent case?

A I have done work as an expert for Dental Monitoring in -- in a dispute with a different 10:17 company.

Q But you were not deposed in that case?

A I have not been deposed in that case.

Q Did you submit any expert reports or declarations in that case? 10:18

A I have submitted at least a declaration.
Q Who was the other party in that case?
A Get-Grin.
Q Have you ever been a witness in litigation that was not a patent case? 10:18
A No, I haven't.
Q And you understand that you are here today with regard to one particular IPR proceeding, correct?
A My understanding is that I'm here with 10:18 regard to the 409 IPR.
Q That's right.
So the IPR in question is IPR2023-01369, and I'll give the full number of the patent, although you just referred to it, but that IPR is related to 10:18 US Patent Number 10,755,409.
Does that sound right?
A That matches the case number and patent number that I have on the front page of my declaration. 10:19
Q And if I use the same shorthand that you just used and refer to the patent as "the 409 Patent" today, will you understand what I'm talking about?
A I will understand that "the 409 Patent" refers to the longer patent number that you just 10:19

mentioned.

Q So if you have it available to you, can you please pull out your declaration for the 409 Patent; that's Exhibit 2028 to be precise. I think you submitted two declarations in this IPR, I'm going to 10:19 ask you about Exhibit 2028 right now.

A Okay. I've got that.

Q Do you have that there?

A Yes.

Q Could you turn to page 142, please? I 10:19 believe that's the last page.

A Okay.

Q Is that your signature in this declaration?

A So my name is typed on the signature line and I was -- I typed my name there as an electronic 10:20 signature.

Q Prior to typing your name as an electronic signature on this declaration, did you carefully review the declaration to ensure its accuracy?

A Yes. 10:20

Q Is there anything today that you believe is inaccurate in your declaration?

A In reviewing the declaration in preparation for today, I noticed that there is in one place a citation to Kusnoto with some section numbers. I'm 10:20

not sure where that citation came from and I'm not sure what document that references.

Q Do you know what page that's on that you're referring to?

A I'm sorry, I don't remember what page it's on. 10:21

Q Aside from that, is there anything about your declaration that you would like to correct or modify today?

A There's nothing at this time that I'd like to modify or correct about the declaration. 10:21

Q About how many hours did you spend preparing your declaration addressing the 409 Patent, Exhibit 2028?

A I don't know for certain. 10:21

Q Did you --

A I would --

Sorry?

Q Who wrote this declaration?

MR. BLYTHE: And Dr. Mongan, let me caution you, in discussing or answering that question, please don't go into the substance of any communications with counsel. 10:22

THE WITNESS: The document started with materials that I wrote and I exchanged drafts back 10:22

and forth with counsel with each of us adding material.

BY MR. ARGENTI:

Q If you'd turn to page 65 of your declaration, please. 10:22

In the top paragraph of that declaration, I think it's paragraph 116 that carries over from the previous page, it looks like there's a citation to Kusnoto and then some sections.

Is that what you were referring to earlier? 10:22

A Yes, that's what I was referring to.

Q Did you do anything to prepare for this deposition?

A Yes.

MR. BLYTHE: Again, Dr. Mongan, just to caution you, as you -- as you answer that, please don't go into the substance of any of the communications or meetings that you've had with counsel within your preparation; but you can answer otherwise. 10:23

THE WITNESS: Yes, I did prepare for this deposition. 10:23

BY MR. ARGENTI:

Q What did you do?

MR. BLYTHE: Same instruction.

THE WITNESS: I met with Mr. Blythe and I 10:23

reviewed some of the -- I reviewed documents on my own.

BY MR. ARGENTI:

Q What documents did you review?

A I independently reviewed my declaration and the 409 Patent. 10:23

Q Anything else?

A Those were the only documents that I independently reviewed.

Q What do you mean by "independently reviewed"? 10:23

A I don't --

MR. BLYTHE: And, again, Dr. Mongan, as -- as you answer these questions, please don't go into the substance of any of the communications that you've had with counsel. 10:24

THE WITNESS: By "independently reviewed" I mean reviewed on my own, outside of a conversation or meeting with counsel.

BY MR. ARGENTI: 10:24

Q Did you review other documents as part of a conversation or meeting with counsel?

MR. BLYTHE: And Dr. Mongan, you can answer that question "yes" or "no," but don't go any further.

THE WITNESS: Yes. 10:24

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BY MR. ARGENTI:

Q What documents were those?

MR. BLYTHE: I'm going to instruct the witness not to answer that question as it goes into attorney/client privilege. 10:24

MR. ARGENTI: Is the witness your client?

MR. BLYTHE: I'm representing him today in this deposition.

MR. ARGENTI: You're invoking attorney/client privilege with the expert witness testifying on 10:24 behalf of Dental Monitoring; is that right?

MR. BLYTHE: I am protecting the work product that we have.

Yeah, I'm protecting work product.

BY MR. ARGENTI: 10:25

Q Did you, Dr. Mongan, review any of the prior art at issue in this case in preparing for this deposition?

MR. BLYTHE: Dr. Mongan, if -- if the answer to that question goes into discussions you had with 10:25 counsel in preparing for this deposition, then I'd instruct you not to answer that.

THE WITNESS: The two documents that I independently reviewed were my declaration and the 409 Patent as part of my preparation for this 10:25

deposition.

BY MR. ARGENTI:

Q That wasn't my question.

And if you're going to decline to answer my question, Dr. Mongan, on the instructions of counsel, 10:25 I just need it clear for the record.

Did you review any of the prior art at issue in this IPR in preparation for your deposition?

MR. BLYTHE: And Dr. Mongan, if you can't answer that question without going into the substance of 10:26 communications with counsel, please don't answer.

THE WITNESS: Can I take a minute to confer with Mr. Blythe about this question of privilege?

MR. BLYTHE: Yes, we can.

We can go off the record and discuss that. 10:26

MR. ARGENTI: Yep. That's okay.

So we'll go off the record. You guys need a short break?

MR. BLYTHE: Yeah. We'll notify you when we're ready to come back. 10:26

MR. ARGENTI: Okay.

(Off the record.)

BY MR. ARGENTI:

Q Okay. Dr. Mongan, so I think the question pending was did you review any of the prior art at 10:29

issue in this IPR in preparation for your deposition?

A I'm unable to answer that question on the advice of counsel.

Q I'm just going to get a little more specific, Dr. Mongan. 10:29

In preparation for your testimony in this deposition, did you review the Salah prior art reference that's an exhibit in this IPR?

MR. BLYTHE: Same objection and instruction.

THE WITNESS: I'm unable to answer that question 10:30 on the advice of counsel.

BY MR. ARGENTI:

Q In preparation for this deposition, did you review the Carrier prior art reference that's an exhibit in this IPR? 10:30

MR. BLYTHE: Same objection and instruction, Dr. Mongan, to the extent answer that question would reveal communications with counsel.

THE WITNESS: I'm unable to answer that question on the advice of counsel. 10:30

BY MR. ARGENTI:

Q In preparation for this deposition did you review the Maninis prior art reference that's an exhibit in this IPR?

MR. BLYTHE: Same objection and instruct. 10:30

THE WITNESS: I'm unable to answer that question on the advice of counsel.

BY MR. ARGENTI:

Q In preparation for this deposition did you review the deposition transcript of Dr. Hassan Foroosh that was submitted in this IPR? 10:31

MR. BLYTHE: Same objection and instruction.

THE WITNESS: I'm unable to answer that question on the advice of counsel.

BY MR. ARGENTI: 10:31

Q Have you reviewed the institution decision from the PTAB in this IPR?

MR. BLYTHE: I'm sorry, hold on one second.

You can answer that.

THE WITNESS: Yes, I have. 10:31

BY MR. ARGENTI:

Q When did you review that?

A I don't recall the exact date. It was over a month ago.

Q Was that the only time that you reviewed the institution decision in this IPR? 10:31

A I don't remember.

Q Did you review the institution decision in this IPR in preparation for your deposition today?

MR. BLYTHE: Dr. Mongan, same objection and 10:32

instruction regarding the documents.

THE WITNESS: I'm unable to answer that question on the advice of counsel.

BY MR. ARGENTI:

Q Can we turn to page 10 of your declaration, please, Exhibit 2028. 10:32

A I'm on page 10.

Q In paragraphs 20 and 21 you identify the material that you considered in forming your opinions, correct? 10:32

A Yes.

Q Did you consider any other materials beyond what's identified here in these paragraphs?

A I don't recall having considered any other materials. 10:33

Q Did you meet with anyone to prepare for your deposition?

A Yes, I did.

Q Who did you meet with?

A I met with Mr. Blythe. 10:33

Q Anyone else?

A I don't recall that I met with anyone else to prepare for the deposition.

Q When did you meet with Mr. Blythe?

A On two occasions over the last week or so. 10:33

Q How long did those meetings last for?

A The first meeting lasted for approximately an hour. And the second lasted for the better part of a day.

Q You got your bachelor's degree in chemistry from Stanford, correct? 10:34

A Yes, I have a bachelor's degree in chemistry from Stanford.

Q And then you received a Ph.D. in bioinformatics from UCSD; is that right? 10:34

A Yes, that's correct.

Q What is "bioinformatics"?

A Bioinformatics is an interdisciplinary field that combines the disciplines of -- combines multiple disciplines including biology, computer science and statistics. 10:34

Q How did you end up pursuing a Ph.D. in bioinformatics after studying chemistry as an undergrad?

MR. BLYTHE: Objection to form. 10:35

You can answer.

THE WITNESS: Can -- can you clarify your question? Are you asking me for the -- the process that I went through to matriculate as a graduate student in bioinformatics? 10:35

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BY MR. ARGENTI:

Q Well, I guess probably not quite.

So you mentioned three disciplines that are combined in the field of bioinformatics: biology, computer science and statistics, right? 10:35

A It includes those three fields.

Q And none of those is chemistry; so I'm just curious what led you to bioinformatics after receiving your undergraduate degree in chemistry.

MR. BLYTHE: Objection to form. 10:36

You can answer.

THE WITNESS: I was a chemistry major and a pre-medical student. My interest in chemistry was particularly focused on biochemistry and the chemistry of living things. And within the biology 10:36 wing of bioinformatics is included biochemistry and biophysics. And I have a longstanding background in computers and computer science and so bioinformatics provided a -- a -- a natural fusion between my interests in biology, biochemistry and medicine and 10:36 my background and interests in computers and computer simulation.

BY MR. ARGENTI:

Q Did you study computer science at all as part of your undergraduate degree in chemistry? Was 10:37

it a minor, anything like that?

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: I had formal coursework in computer science as part of my graduate degree. I 10:37
did not have formal coursework in computer science as part of my undergraduate degree, but I worked as a programmer throughout my time as an undergraduate and also wrote a book on computer programming shortly after I graduated. 10:37

BY MR. ARGENTI:

Q What are some typical areas of science or medicine where bioinformatics is used?

A Bioinformatics is a broad field and it means different things to different people. Broadly, I 10:38
would consider bioinformatics to be the application of -- the application of computers to biologic and biomedical problems.

Q What are some of those problems that bioinformatics might be applied to? 10:38

A So with the broad definition of bioinformatics that I would tend to work from of it being the application of computers to biologic and biomedical problems, it could include my research in artificial intelligence and radiology. It would 10:38

include the work I did as a graduate student in computer simulation of biomolecules and drug design. It could include a lot of genetics and genomics work. It's a -- a broad field and could include many, many things. 10:39

Q In addition to your Ph.D., you also have a medical degree; is that right?

A Yes, that's correct.

Q You do not have a dental degree though, correct? 10:39

A I do not have a dental degree.

Q Do you consider yourself a dental professional?

A I do not consider myself a dental professional. 10:39

Q Do you have any professional experience in the field of dentistry?

A I have no professional experience in the field of dentistry, which is one of the reasons why I consulted with a dental and orthodontic professional 10:39 in this matter.

Q So just in case there's any distinction between dentistry and orthodontics, I'll ask you do you have any professional experience in the field of orthodontics? 10:40

A I have no professional experience in the field of orthodontics.

Q Let's turn to page 25 of your declaration, please. And we'll look at paragraph 51.

Let me know when you're there. 10:40

A I'm there.

Q And toward the end of that paragraph you say that you have consulted with Dr. Budi Kusnoto, DDS, MS, in forming your opinions, including as specifically noted throughout your report. 10:40

Do you see that?

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: I see the last sentence at paragraph 51. 10:40

BY MR. ARGENTI:

Q Is that what you were just referring to in your earlier answer when you said that you had consulted with a dental professional in forming your opinions? 10:41

A Yes, I was referring to consulting with Dr. Kusnoto.

Q So is it accurate to say that you relied on Dr. Kusnoto's views to inform you as to the understanding a dental professional would have as to 10:41

certain prior art in this IPR?

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: My consultation with Dr. Kusnoto informed me of how a dental professional would 10:41 understand terms and concepts in the material that I was reviewing.

BY MR. ARGENTI:

Q Are you aware that Dr. Kusnoto submitted a declaration in this IPR? 10:41

A I'm aware he submitted a declaration.

Q Have you reviewed Dr. Kusnoto's declaration?

A I have not seen Dr. Kusnoto's declaration.

Q How many discussions with Dr. Kusnoto have you had regarding the materials in this IPR? 10:42

A I don't recall the exact number, at least two.

Q When did those take place?

A I don't recall the exact dates.

Q Were they both before you submitted your 10:43 declaration in this case?

A Yes.

Q Who was present at those discussions between you and Dr. Kusnoto?

A Dr. Kusnoto, some of the 10:43

Gibson, Dunn attorneys and me.

Q Were the Gibson, Dunn attorneys participating in the discussion?

A My recollection is that all parties spoke and participated. 10:43

Sorry.

My recollection is that I spoke and participated, Dr. Kusnoto spoke and participated, and at least one of the attorneys spoke and participated.

Q So I think -- I think we probably need to be 10:44 a little more precise when I ask you about whether these discussions took place before you submitted your declaration in this case because now I'm remembering you've submitted two declarations in these cases -- or in this particular IPR; there was 10:44 the declaration for institution that's been labeled Exhibit 2002 and then there's the declaration that I've been asking you about which is Exhibit 2028, right?

A Let me look at the other exhibit you're 10:44 referencing so that I make sure that that's --

You said 2028?

Q 2028 is the one that we've been looking at. And then 2002 was your first declaration in this IPR.

A Yes, I have both of those declarations here 10:45

in front of me.

Q Okay. So these discussions, the two discussions at least that you remember having with Dr. Kusnoto, you testified that they were -- that they took place before you submitted your declaration 10:45 in this case but I'm going to break it up a little bit more because with these two declarations now in mind.

So did the two discussions that you referenced with Dr. Kusnoto take place before you 10:45 submitted your first declaration, Exhibit 2002?

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: My most recent -- my most recent conversation with Dr. Kusnoto was after the 10:46 submission of the first declaration. I don't remember what the temporal relationship of my first consultation with Dr. Kusnoto and the submission of the first declaration was.

BY MR. ARGENTI: 10:47

Q Were the issues that you discussed with Dr. Kusnoto limited to the ones where you specifically refer to him in your declaration, Exhibit 2028?

A I don't recall for certain. 10:47

Q You don't recall whether you discussed with Dr. Kusnoto other issues beyond those where you identify in your declaration that you have an understanding based on Dr. Kusnoto?

A There may have been but I don't -- I don't 10:48 remember.

Q Did Dr. Kusnoto give you any information about the understanding of a dental professional that you ultimately decided not to incorporate into your declaration? 10:48

A So I spoke with Dr. Kusnoto for some time, certainly not every word that he said made -- you know, certainly not every word that he said is represented in this declaration. But the relevant points that I took -- that I understood from him are 10:48 represented in this declaration.

Q Can you identify for me what information you got from Dr. Kusnoto that you decided was not relevant to your opinions?

MR. BLYTHE: Objection to form. 10:49

You can answer.

THE WITNESS: I don't recall specific information that I received from Dr. Kusnoto that I decided was not relevant.

BY MR. ARGENTI: 10:49

Q Have you had any discussions with Dr. Kusnoto that took place after you signed your declaration in this case?

A Can you clarify which declaration you're referring to? 10:50

Q Good point.

Have you had any discussions with Dr. Kusnoto that took place after you signed your second declaration in this case, Exhibit 2028?

A I don't recall of any conversations with 10:50 Dr. Kusnoto regarding this IPR after the date at which I had signed Exhibit 2028.

Q What experience do you have with deep learning and neural networks?

A It's a field that I've been working in for 10:51 quite some time, mostly with the application to radiologic problems because I'm a radiologist; so I have experience with conducting my own original research and constructing algorithms for radiologic purposes, reviewing particles related to deep 10:51 learning.

I'm on the radiology -- the editorial board for the Journal of Radiology Artificial Intelligence, and also with organizing and supervising artificial intelligence and deep learning competitions. 10:52

Q What kind of competitions?

A Competitions that are run through the Kaggle platform under the auspices of the Radiological Society of North America.

Q You're a coauthor on a paper entitled "High-Throughput Classification of Radiographics Using Deep Convolutional Neural Networks," correct? 10:52

A That sounds familiar.

Do you have a copy of my CV that I can confirm whether or not that's the correct title? 10:52

Q Well, instead of that, what I will suggest is that I will get this uploaded to Exhibit Share --

A Okay.

Q -- the paper itself; so just bear with me one second. 10:53

A While you're doing that, I'm just going to go adjust the thermostat in here; it's getting kind of cold in this room.

Q Sure.

I believe I have uploaded it so it should be available to you through Exhibit Share. 10:53

A I see Exhibit 1033.

Q And are you able to download it or otherwise view the entire document?

A I'm working on that. Give me just a second. 10:54

MR. BLYTHE: Counsel, I'll just note for the record that the exhibit stamp appears to be covering some of the text under the first page of the exhibit.

MR. ARGENTI: Understood. I think we will --

If and when we were to submit this as an exhibit in the IPR, we would relabel it with the same exhibit number, Exhibit 1033, but a different format to avoid that text. 10:54

And if the label is an issue at all -- I don't think it will be but if there is an issue at all, we can figure out a workaround but hopefully that's not a problem. 10:55

MR. BLYTHE: Well, I'm not going to dictate to you how you're going to manage the exhibits. But since this is coming into the record, I'm going to go ahead and object to this exhibit, including on the basis that it's incomplete, has a stamp covering part of the words. 10:55

I'm also going to object to this exhibit on the grounds of hearsay, authenticity and relevance. 10:55

THE WITNESS: I have the document open in front of me now.

MR. ARGENTI: Great.

You know what I'm actually going to try and do, though, is it possible -- 10:55

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Let's go off the record for this.

(Off the record.)

MR. ARGENTI: All right. Back on the record.

Q Dr. Mongan, just to fill in -- get the transcript up to speed, what I did when we were off 10:57 the record was upload a second copy of the same paper to the Exhibit Share system; this one does not have the exhibit-numbered label on the bottom corner of the first page, so hopefully we can avoid any issues about a partial copy or obscuring of the contents. 10:58

So ultimately this exhibit will be given the designation of Exhibit 1033, that's how I will refer to it today, to the extent that I use an exhibit number, but we can look at the copy that is unlabeled and doesn't have the sticker on the first page that's 10:58 obscuring this content.

Does that sound good to you?

A I have the unlabeled copy in front of me.

MR. BLYTHE: And one moment.

So just to clarify for the record, there's a 10:58 PDF whose title is "Exhibit 1034" and that's going to be treated as Exhibit 1033 today?

MR. ARGENTI: Correct. I think that probably, if anything, confuses the record because what will matter will be what's uploaded to the PTAB's system 10:58

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and this paper entitled "High-Throughput Classification of Radiographics Using Deep Convolutional Neural Networks" will have an IPR exhibit number of 1033 and we will be referring today to the label -- the version of it that does not 10:59 have an exhibit sticker label on it.

MR. BLYTHE: Okay. I will note for the record that the CFR requires that these exhibits are stamped as they go into the record in deposition in accordance with the filing requirements for exhibits, 10:59 but I think I understand that the exhibit whose PDF is labeled "1034" will be Exhibit 1033 going forward in the deposition.

I preserve the same objections as before.

BY MR. ARGENTI: 10:59

Q So Dr. Mongan, do you recognize this as a paper on which you are a coauthor?

A I see my name on this paper and this looks like a paper that I published, yes.

Q According to your CV, this paper was 11:00 published in the Journal of Digital Imaging in February 2017; is that accurate?

A So I recall that this paper was published in the Journal of Digital Imaging. I see on the document that you've provided for me that it says 11:00

"Published online: 11 October, 2016." I don't have a copy of my CV in front of me to see what the -- what I would have listed as the publication date there which would likely refer to the publication in the paper version of the journal. 11:00

Q If you'd like, you have a copy of your CV available there to you; that's Exhibit 2029.

A I'm looking for that now.

Yes.

Q And if you turn to page 34 of your CV, 11:01 Exhibit 2029 --

A Yes, I'm on page 34.

Q -- is this paper listed in entry 20 on that page?

A Entry 10 -- entry 20 has the same title as 11:01 the document that you've put in front of me, yes.

Q Do you understand that to be this paper that is the Exhibit 1033?

A I have no reason to believe otherwise.

Q And for entry 20 it states that it was 11:02 published in the Journal of Digital Imaging in 2017, February, correct?

A So in my CV the date associated with that -- with that publication is February 2017, which I believe refers to the paper publication date. And, 11:02

again, I note that it says "Published online: 11 October, 2016" in the document that you've provided to me.

Q Do you have any reason to doubt that this paper was published online in October 2016 and 11:02 published in a paper copy in February of 2017?

A I have no reason to doubt that.

Q At a high level, what were you studying in connection with this article?

MR. BLYTHE: Objection to form. 11:02

You can answer.

THE WITNESS: So it's been several years since I published this, I'd like to review it for just a couple minutes before I answer that question.

BY MR. ARGENTI: 11:03

Q Sure.

A So at a high level, we were working to develop a deep learning algorithm that could distinguish between frontal and lateral chest radiographs and then to test the performance of that 11:03 algorithm.

Q What was your role in that research?

A My role in the research was as one of the -- what was as the senior author. In that role, I helped to -- 11:04

In that role, I helped to develop the research question to guide the research that was performed, to obtain and curate the dataset, and to organize, draft and edit the paper.

Q The research described in this paper used a deep convolutional neural network, correct? 11:04

A The research in this paper used the GoogLeNet model. I don't have that reference in front of me to confirm with certainty but I believe that it would be characterized as a deep convolutional neural network. 11:05

Q And is that "GoogLeNet model" that you just referred to the one that's discussed in the top left column on page 97 of this paper?

A Yes, that's what I'm referring to. 11:06

Q So that's with reference to note 19, which is attributed to Szegedy, S-Z-E-G-E-D-Y, et al.?

A Yes.

Q Were you personally involved in training the neural network used in this research? 11:06

A Can you clarify what you mean by "personally involved"?

Q What was the extent of your involvement in training the network -- neural network used in this research? 11:06

A My involvement -- excuse me. My involvement was to participate --

So this was a group project, as most science is, and my role as a senior member of that group was to help select which network we used, to help design 11:07 the experiments that were conducted, to troubleshoot problems with the training and to analyze the results of -- of the training.

Q Now, this paper explains that you and your team started with 1885 images from 909 patients, 11:07 right?

A Can you give me the reference to the location that you're getting that from in the --

Q Sure.

Why don't we look at page 96 in the first 11:08 paragraph under the heading "Image Collection and Training, Validation, and Test Set Creation."

A Okay. And can you repeat your question, please?

Q Sure. 11:08

In this paper you explain that you and your team started with 1885 images from 909 patients, correct?

A That's what it says here and that matches my recollection, to the extent that I can recall the 11:09

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approximate magnitudes of the data we were using and working with.

Q And then in this section on the same page, for example, a couple paragraphs further down, you explain that your team then split those images into 11:09 training, validation and test sets, correct?

A The paper here says "The images were then randomly split into training, validation and test sets."

Q The initial training set has 1129 images, 11:09 correct?

A That's what it says here, yes.

Q Is that accurate?

A I can't recall the exact --

You know, I can't independently recall the 11:10 exact number of images that would have been in the training set from research that I did eight years ago. I have no recollection of that --

Q Do you have any reason to doubt the accuracy of this paper on which you're a coauthor? 11:10

MR. BLYTHE: Hang on.

Were you done answering that question, Dr. Mongan?

THE WITNESS: I wasn't quite done answering that question. 11:10

MR. ARGENTI: Oh.

THE WITNESS: I have no reason to doubt the accuracy of this paper, assuming that you took -- the document that I have in front of me is -- you know, is the paper that I published. 11:10

But I have -- I can't independently recall what the number is.

BY MR. ARGENTI:

Q Do you have any reason to doubt that the paper you have in front of you is the paper you 11:10 published?

A I have no reason to doubt that.

Q So this section under the "Methods" heading on page 96 your paper goes on to describe augmenting the training set by applying image transformations to 11:11 this set, right?

A Yes.

Q And the paper says that each initial image resulted in 106 child images, correct?

A Yes, it does. 11:11

Q And it also says that the labeling from the initial parent image was carried over to the respective child images, right?

A It says the label -- it says "child images with the label inherited from the parent image." 11:11

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Q And as a result of the transformation augmentations, you then had a learning base of 119,674 training images, correct?

MR. BLYTHE: Objection to form.

You can answer. 11:12

THE WITNESS: That's not how I'd characterize the statement in -- in this paper.

BY MR. ARGENTI:

Q How would you characterize it?

A I would say that our training -- 11:12

Assuming you're using learning base in the context that it's used in the 409 Patent, I would say that we had a learning base of 1129 images and that we performed augmentation on that learning base of 1129 images. 11:12

Q So in your view, once there were transformation augmentations applied to 1129 images the result was no longer a learning base?

MR. BLYTHE: Objection to form.

You can answer. 11:12

THE WITNESS: My opinion is that a POSA would consider the most accurate characterization of the size of the learning base to be the number of independent images. The augmented images are all -- the augmented images that come from a single parent 11:13

image are all very similar to each other and are not independent.

BY MR. ARGENTI:

Q But in any event, the 119,674 augmented images were the images that you used to train your 11:13 neural network, correct?

A Those were the images that we used to train the neural network.

I'd like to contextualize that by noting that augmentation is a standard practice in training 11:13 for deep learning. And typically in modern deep learning, augmentation is applied randomly on -- on the fly each time an image is trained on, such that there are effectively an infinite number of augmented images. 11:14

In this particular investigation, because it was so long ago and because the tools that we were using were limited and did not have the ability to randomly perform augmentation on the fly, we had to manually produce a set of augmented images in order 11:14 to implement augmentation within our training.

Q So in your view, just so I have it right, the 1129 images before augmentation, that was the learning base that you were working with; is that right? 11:15

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: In my view, the most accurate representation of the size of the learning base that I was working with would be 1129 images. 11:15

BY MR. ARGENTI:

Q And then after applying transformation augmentations, you then used those images to train the neural network that you used in this research, right? 11:16

A The augmented images were what --

The -- the combination of the original images and the augmented images --

Let me look at this again.

The augmented images were used in the 11:16 training. I don't recall whether the original nonaugmented images were also used in the training as well or not.

Q Now, when you gave me that explanation about the change in the approach to augmentation over the 11:16 past few years and you said at the time of your research it required manual augmentation, now it can be done more randomly and automatically, is that a meaningful distinction in your mind in terms of whether augmented images would be considered a 11:17

learning base?

MR. BLYTHE: Objection to form.

You can answer.

THE WITNESS: I bring that up because you were pointing to a specific number of augmented images. 11:17

If you have to create a set of augmented -- of augmented images prior to training as physical -- you know, as files that exist on a disk, then you have to create some number of those images, you have to pick how many of them you're going to create. 11:17

If you do the augmentation as a processing step on the fly as each image is -- is being used for training, then the number of augmented images that you have is no longer a really meaningful concept because every time it trains on a given image, it 11:18 will be augmented differently. And so the number of augmented images is just the number of times that it sees the -- you know, that it sees the image in training. That was the distinction that I was drawing. 11:18

BY MR. ARGENTI:

Q I see. Thanks.

Why did you train the neural network in this research?

MR. BLYTHE: Objection to form. 11:18

You can answer.

THE WITNESS: Can you clarify that question?

BY MR. ARGENTI:

Q What clarification would be helpful?

A You asked me why I trained the neural 11:19
network in this research. What -- what are you
proposing as the alternative to that?

Q Would it be --

Would it have been possible to use a neural
network for the analysis in your research without 11:19
training it?

A It would be computationally possible to feed
input data into an untrained network and you would
get an output but you would expect that that output
would be essentially random and would not have any 11:19
utility.

Q So to have practical utility, it's necessary
to train a neural network before it can be used for
an image analysis; would you agree?

MR. BLYTHE: Objection to form. 11:20

You can answer.

THE WITNESS: So an untrained network will not
produce a useful result.

MR. ARGENTI: We've been going a little over an
hour. Would you -- 11:20

Is this a good time for a break, Dr. Mongan?

THE WITNESS: This would be a good time.

Yes. Thank you.

MR. ARGENTI: Okay. Off the record.

(Off the record.) 11:20

THE REPORTER: Back on.

BY MR. ARGENTI:

Q Dr. Mongan, I'm going to continue asking a few questions about your paper where you're a coauthor, it's titled "High-Throughput Classification 11:31 of Radiographics Using Deep Convolutional Neural Networks."

Can we turn back to the first page of this paper?

In the second paragraph under the heading 11:31 "Background," do you see where it says "Computer vision underwent a revolution in 2012, when deep learning approaches that harnessed convolutional neural networks halved the error rates in standardized image classification challenges compared 11:32 to other best competitors"?

A Yes, I see that sentence.

Q What did you co- --

What did you and your coauthors mean when you referred to a "revolution" in computer vision in 11:32

2012?

A We were referring to a large and stepwise improvement in performance on the ImageNet classification challenge.

Q At the end of that sentence you specifically 11:32 cite two papers, correct?

A I see two citations there, yes.

Q And the first citation, note 5, is to a paper by Lecun, L-E-C-U-N, and others, right?

A Yes. 11:33

Q And the second citation, note 6, is to a paper by Krizhevsky, K-R-I-Z-H-E-V-S-K-Y, and others, correct?

A Yes.

Q Is that Krizhevsky paper one that describes 11:33 AlexNet, A-L-E-X-N-E-T?

A Do you have a copy of that paper so I can confirm that?

Q I do not but I believe --

And do you have a copy of Exhibit 1015 in 11:34 your materials there?

A No, I don't.

Q That's fine.

Are you familiar with AlexNet, A-L-E-X, Imaging? 11:35

A I have -- I have heard of AlexNet.

Q What is AlexNet?

A So I would prefer to refer to the paper describing AlexNet so that I'm not relying on my memory. But to the best of my recollection, it is an 11:35 early deep convolutional neural network for image classification.

Q Bear with me, Dr. Mongan, and I will attempt to upload the exhibit I was just referring to.

A Sure. 11:36

Q I know it's going very slow.

Oh, there we go. It should be uploaded and available to you now, Dr. Mongan.

A Thank you. Let me check.

Okay. I see Exhibit 1035, Krizhevsky. 11:37

Q And just to clarify for the record, this is not Exhibit 1035, this is Exhibit 1015 that has already been submitted in this IPR, which is the label that is on the record, and I believe I uploaded it as an unstamped copy so it bears Align - 11:38 Exhibit 1015, which is the IPR exhibit number. That's the number that we'll use to refer to it, okay?

A Thank you. I see "Align - Exhibit 1015" at the bottom of the first page. 11:38

Q Great.

Is this the paper that is cited in your paper at note 6?

A The papers have the same title. My citation is -- it looks like it has a citation to a journal, 11:39 Advanced Neural Information Processing Systems or something to that effect. I don't see any such markings on this document; so I don't know if this is exactly the same version of the manuscript that we were citing. But it at least appears to have the 11:39 same title and the same authors.

Q Okay. And reviewing this Exhibit 1015, does that refresh your recollection as to what AlexNet is?

Actually, strike that, let me ask that question a different way. 11:40

Does this reviewing this Exhibit 1015 confirm your recollection that AlexNet is an early deep convolutional neural network for image classification?

A Can you point to me where in this document 11:40 it says "AlexNet"?

Q I'm not sure it does use that term, Dr. Mongan, although I will note that it -- "Alex" is the first name of the Krizhevsky author.

A So I -- 11:41

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Q Is it your understanding that this paper describes an early convolutional neural network for image analysis?

A So this is a paper that I haven't looked at recently. Let me take a minute to review at least 11:41 the abstract here.

So the abstract describes what they did as a deep convolutional neural network and it describes that this work was the winning entrant in the ILSVRC-2012 competition; so on the basis of that, I 11:42 would understand this to be an early deep convolutional neural network.

Q Did you review this paper, Exhibit 1015, in preparing either one of your declarations in this case? 11:43

A This is a paper that looks familiar to me and I believe I have read or reviewed at some point in the past. I don't recall specifically reviewing it for the purposes of preparing my declarations in this case. 11:43

Q So even though in your declaration you say that you cited the exhibits cited in Dr. Foroosh's declaration, there may be some that you didn't review; is that right?

MR. BLYTHE: Objection to form. 11:43

You can answer.

THE WITNESS: So I reviewed the exhibits and references that were relevant in responding to Dr. Foroosh's declaration in combination.

BY MR. ARGENTI: 11:44

Q How did you know if a reference that he cited was relevant or not if you didn't review it?

MR. BLYTHE: Objection to form.

You can answer.

MR. ARGENTI: Counsel, every time you instruct him that he can answer it's in violation of the rules. 11:44

MR. BLYTHE: My apologies.

I'm doing that to make it clear to the witness that I'm not instructing him not to answer, but if you'd prefer that -- 11:44

MR. ARGENTI: I think we can maybe just stipulate that he can answer all the questions, and, in fact, under the rules should answer all the questions, and that there's only a limited subset in which you are permitted to instruct him not to answer. 11:44

MR. BLYTHE: I don't think there's a problem with what I've been doing, but I have no problem just saying "Objection to form" going forward. 11:44

THE WITNESS: Could you repeat your question, sir?

BY MR. ARGENTI:

Q How did you know if a reference cited in Dr. Foroosh's declaration was relevant or not if you didn't review it? 11:45

MR. BLYTHE: Objection to form.

THE WITNESS: I made that determination based on how the reference was used in his declaration and my understanding of the field from my experience in the field. 11:45

BY MR. ARGENTI:

Q Were you aware of the AlexNet neural network at the time you coauthored your 2016 paper that we looked at earlier? 11:45

A I can't recall the date at which I became aware of AlexNet.

Q But you were aware of the neural network described in Exhibit 2015 -- I'm sorry, 1015 at the time that you coauthored your own paper in 2016, right? 11:46

MR. BLYTHE: Objection to form.

THE WITNESS: Sorry. Can you restate that, please?

BY MR. ARGENTI: 11:46

Q Were you aware of the neural network described in Exhibit 1015 at the time that you coauthored your own paper in 2016?

A Yes.

Q How did you and your team decide to work with the GoogLeNet neural network for your research as opposed to something like the neural network described in Exhibit 1015? 11:46

A I -- I don't recall the details of those research design decisions from eight years ago. 11:47

We were working with the DIGITS framework as described in the paper. I believe that we chose the model that we thought would provide the best results from amongst those that were available within the DIGITS framework. We may have tested more than one model, I don't recall. 11:47

Q What is the "DIGITS framework"?

A So you'll see at the bottom of page 96 and the top of page 97 it refers to the NVIDIA Deep Learning GPU Training System (DIGITS) DevBox (Version 3). 11:48

Q And when you just said that you -- I think you chose the model that your team thought would provide the best results from amongst those that were available within the DIGITS framework, what were some 11:48

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of the factors that you considered in making that determination?

A I really can't recall the details of that. It's been quite some time.

Q I want to go back to paragraphs 20 and 21 of your declaration where you talk about materials and information you considered when forming your opinions here, I believe. And we talked about how you -- you say that you considered the petition, Dr. Foroosh's declaration and the exhibits cited therein. 11:49 11:50

And then you also talk about that you considered materials that you identified in your declaration; so those would be the exhibits cited in your declaration. And those filed by petitioner and patent owner in this proceeding. 11:50

Do you recall earlier I asked you some questions about the documents that you reviewed in preparation for this deposition?

MR. BLYTHE: Objection to form.

THE WITNESS: Yes, I recall you asked me questions about documents that I reviewed. 11:51

BY MR. ARGENTI:

Q And in particular, I asked you about some of the individual prior art references at issue in this IPR and whether you had reviewed those and 11:51

Dental Monitoring's counsel instructed you not to answer.

Do you remember that?

A Yes, I recall that.

Q So I have a somewhat different but related 11:51
question now which is in preparing for this deposition, did you review any documents that aren't within the scope of what you refer to in paragraphs 20 and 21 of your declaration?

MR. BLYTHE: And, Dr. Mongan, I'm going to 11:51
instruct you not to go into that to the extent it goes into the discussions that you had with counsel in preparing for this deposition. If you can answer that outside the substance of that, which is protected by work product, you can do so. 11:51

THE WITNESS: The documents that I independently reviewed in preparing for this deposition were my declaration and the 409 Patent, which I believe either are the documents that I'm looking at here or falls within the scope of materials considered. 11:52

I've been instructed by counsel not to respond to parts of the question that would involve documents that I may or may not have reviewed in collaboration with counsel.

BY MR. ARGENTI: 11:52

Q That's fine, and I understand that's the instruction, I just need to get it out for the record; so thank you.

One -- one more question on that point just to -- just to make sure that we're clear. 11:53

Dr. Mongan, you are declining to answer my question whether you have reviewed any materials in preparation for this deposition that aren't cited or mentioned in your declaration; is that right?

MR. BLYTHE: Hang on. 11:53

So, Dr. Mongan, to the extent you can answer that question without going into the substance of communications with counsel, either during our, you know, discussions with counsel during this deposition or advice regarding how to answer these questions or 11:53 during other communications with counsel, you can answer that to the extent you have an answer.

THE WITNESS: Can I take a short break here to confer with Mr. Blythe on this issue of privilege?

MR. ARGENTI: If you think it's necessary in 11:54 order to answer my question --

MR. BLYTHE: We will take that break if you're requesting it; so, yes, let's go off the record.

(Off the record.)

MR. BLYTHE: We're ready to continue, 11:56

Mr. Argenti.

Could you repeat your question, please?

BY MR. ARGENTI:

Q Sure.

The question that was pending is, 11:56

Dr. Mongan, is it right that you are declining to answer my question regarding whether you have reviewed any materials in preparation for this deposition that aren't cited or mentioned in your declaration? 11:56

MR. BLYTHE: Same instruction, Dr. Mongan, regarding not going into the substance of communications with counsel.

THE WITNESS: So I'm responding with respect to the documents that I independently reviewed which 11:57 I've enumerated for you. And I can't otherwise answer the question without going into the substance of communications that I had with counsel.

MR. BLYTHE: And, Mr. Argenti, for the record, what is your basis -- 11:57

Is it Align's position that communications with expert witnesses in this proceeding or these IPR proceedings are somehow discoverable or not otherwise protected by work product protection?

MR. ARGENTI: I'm not asking him about 11:57

communications in these questions that you're instructing him not to answer. My questions are about the basic foundational issue of what materials Dr. Mongan reviewed in preparation for this deposition. 11:57

He's refused to answer whether he reviewed the prior art references at issue. He's refused to answer whether he reviewed any materials that aren't cited in his declaration.

This is a completely improper instruction 11:58 not to -- instruction to him not to answer these questions and we're going to reserve the right for appropriate motions, including a motion to strike all or a portion of his testimony, and a motion for sanctions. 11:58

MR. BLYTHE: To clarify your -- you misstated the record.

He has not refused to answer whether he has reviewed any materials that aren't cited in his declaration. He has refused to go into the substance 11:58 of communications with counsel regarding his preparation for this deposition.

You have asked him and he has answered regarding what documents and materials he considered in forming the opinions in his report, and you're 11:58

entitled to continue asking him questions about that subject to our objections. You are not entitled, and I have not heard a basis for getting to the substance of communications with counsel, including in preparing for this deposition or otherwise. 11:58

BY MR. ARGENTI:

Q Dr. Mongan, in preparing for this deposition did you review any materials that are not cited or referred to in your declaration?

MR. BLYTHE: And, Dr. Mongan, the same 11:59 instruction; you can answer that to the extent you do not reveal the contents of communications with counsel.

THE WITNESS: Mr. Argenti, I believe this is the same question you've asked me now a couple of times. 11:59

I've described to you the documents that I reviewed independently. And other documents that I reviewed as part of my meetings with Mr. Blythe in preparation for this deposition, I've been instructed not to answer to that. 11:59

MR. ARGENTI: That's fine. I just had to ask the question again since Dental Monitoring's counsel said that I hadn't asked it; so I think we're now on the same page now that I've asked the question that's been asked and that you've been instructed not to 12:00

answer.

Q Let's turn to page 95 of your declaration, please, Dr. Mongan.

A I'm there.

Q On this page, and in particular starting at 12:00 paragraph 154 you discuss your understanding of the term "real time" in claim 14 of the 409 Patent, correct?

A Yes.

Q And you say, in paragraph 154, that 12:00 "A POSA would have understood that the term 'real time' means that the analysis in checking occur 'immediately,' while the image" -- "image acquisition process is still underway," right?

A That's what it says here, yes. 12:00

Q What do you mean by "immediately" in that sentence?

A I'm reviewing the specification of the 409 Patent because I believe it speaks to that and I believe that's where "immediately" came from. 12:01

Q If it helps, you do cite the specification in paragraph 155 of your declaration.

A So I believe your question was what does "immediately" mean here?

Q Right. 12:02

A So "immediately" is somewhat context-dependent, but it means soon enough to be part of the acquisition process and for the analysis and feedback that is provided to be useful in the context of that acquisition process. 12:03

Q So you're not putting a particular time duration limitation on that; is that right?

A I'm not generally establishing any specific time duration to --

The approximate time duration would be 12:03 somewhat context-dependent.

Q Let's turn to page 106 of your declaration, please.

A Yes.

Q And in this section you're talking about the 12:03 Salah prior art.

If we look at paragraph 176, you say that Salah discloses a particular automatic alignment method that uses registration marks.

Do you see that? 12:04

A Yes, I see that.

Q And then in the next paragraph, 177, you go on to opine that Salah's registration marks are placed on retractors, right?

A Yes. 12:04

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Q Let's pull out the Salah exhibit. And, in particular, let's take a look at the translation exhibit that's been submitted as Exhibit 1008.

A Yes.

Q Is this the exhibit that you're referring to when you discuss Salah in your declaration? 12:04

MR. BLYTHE: Sorry, Counsel, to clarify, this is the document that says "Align - Exhibit 1008" at the bottom of the first page?

MR. ARGENTI: Right. Correct. 12:05

THE WITNESS: Yes, I believe it is.

BY MR. ARGENTI:

Q Did you read this document in its entirety when forming your opinions in this case?

A Yes, I did. 12:05

Q If you could turn to page 19 of Exhibit 1008, it has a list of figures and do you see where it says "figure 7 schematically illustrates the relevant position of registration marks 12 on updated images 14 and 14 sub 2" of a retractor pen? 12:06

A Yes, I see that.

Q If we turn to Figure 7, the figures are at the end of this document --

Let me know when you're there.

A Uh-huh. 12:06

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Okay.

Q Looking at Figure 7 of Salah, which element or elements in this figure are the registration marks?

A So the registration marks are indicated as 12:07
registration marks 12. And I see that a portion of Figure 5A is labeled as 12.

The printout that I have of this is not of sufficient quality for me to visualize what is being pointed at as 12. 12:08

Do you have an electronic copy of this with color figures or some other better rendering of the -- the figure that I might look at for 5A to -- to better see what is indicated as 12?

Q So, no, this is the exhibit that we have to 12:08
live with.

And we'll get to 5A; I plan on asking you about 5A but first I was asking about Figure 7.

A I understand.

Q What's your understanding of what the 12:08
registration marks are in Figure 7?

A And -- and I understand that you're asking me about Figure 7.

Since Figure 7 is referring to something that is also indicated in Figure 12, to confidently 12:09

answer that question, I would like to have a better version or visualization of Figure 5A so that I can correlate what is labeled as the registration marks with what I'm seeing in Figure 7.

Q Got it. Got it. 12:09

So, yeah. I think you mentioned Figure 12 in that answer, you said Figure 7 is referring to -- that is also indicated in Figure 12.

A Sorry. I think it's actually Figure 5A that has a portion of it labeled as 12. 12:09

Q Right.

So is it your understanding then that the element labeled 12 in Figure 5A is referring to a registration mark?

A Yes, I believe that to be the case. 12:09

Q And then the element 10 in Figure 5A would be a retractor since that description in Figure 7 that we saw used element 10 to refer to a retractor; is that right?

MR. BLYTHE: Objection to form. 12:10

THE WITNESS: So I see in the caption that you directed me to on page 19 that it refers to a retractor labeled 10. And I see in Figure 5A that there is a portion of that figure that is labeled with a 10. 12:10

BY MR. ARGENTI:

Q And I think we've already covered this but just to be clear, are you able to tell me how many registration marks are shown in Figure 5A?

A I see a region of the image that has a line extending from it towards a label of 12, but I can't see that region of the image clearly enough to determine how many marks there may be there. 12:11

Q Is the retractor in Figure 5A a one-part retractor or a two-part retractor? 12:11

MR. BLYTHE: Objection to form.

THE WITNESS: I'm not sure I can tell with certainty from this image.

BY MR. ARGENTI:

Q Looking below Figure 5A, do you see Figure 5C on the same page? 12:12

A I do see Figure 5C.

Q Figure 5C also depicts a retractor, right?

A Figure 5C depicts the lips being held back by some apparatus that I think could be reasonably described as a retractor. 12:12

Q And it looks like that apparatus in Figure 5C is different than the retractor in Figure 5A, correct?

A They do not appear identical to me. 12:12

Q For example, it looks like they have a different shape, the retractor in Figure 5A has close to right angle corners at its edges whereas the apparatus in 5C lacks those corners; do you agree?

MR. BLYTHE: Objection to form. 12:13

THE WITNESS: So there are things that I see in Figure 5A and I see some corners that I do not see in 5C; whether that represents a completely different device or different elements of the same device being present, I don't know. 12:14

BY MR. ARGENTI:

Q Figure 5C doesn't have any labeling identifying a registration mark, right?

A I don't see any labeling on Figure 5C other than "Figure 5C." 12:14

Q Can you tell if the apparatus in Figure 5C has any registration marks?

A I -- I can't tell. It has similar image quality to Figure 5A where there's a portion that's labeled as registration marks that I'm not really 12:14 able to see; so I don't think the image quality here would be sufficient for me to determine whether or not there are registration marks in 5C.

Q If we look back at Figure 5A, based on the location of that identification of element 12, in 12:14

order to include the registration mark in the image, the photo needs to capture the outer edges of the retractor, right?

A I'm not sure if that's precisely true. I think that the image would need to capture the 12:15 registration marks. It might be possible to capture the registration marks without capturing the outer edges of the retractor.

Q So if the retractor had registration marks at its four corners, the camera would need to include 12:15 those four corners in the frame of the image, right?

A I think that in order to use the registration marks --

I'm sorry, there's some lint on my track pad and I accidentally turned off the video for a second. 12:15

I think that in order to use the registration marks in processing -- in order to use the registration marks, the registration marks would have to be included in the frame of what was being processed. 12:16

Q Let's turn back to your declaration, Exhibit 2028, and let's go to paragraph 179, which starts on page 107.

A Yes.

Q And in the first sentence of that paragraph 12:16

179 you say that "Salah teaches away from measuring the patient's teeth to evaluate alignment during the image acquisition process," correct?

MR. BLYTHE: Objection to form.

THE WITNESS: So it says here "Salah expressly 12:16 teaches away from measuring the patient's teeth to evaluate alignment during the image acquisition process."

BY MR. ARGENTI:

Q And the issue you're addressing in that 12:17 paragraph relates specifically about how to align an image, correct?

MR. BLYTHE: Objection to form.

THE WITNESS: So the issue that I'm discussing here relates to how to position the acquisition 12:17 apparatus with respect to the patient during acquisition.

BY MR. ARGENTI:

Q What part of Salah are you referring to there when you say it "teaches away"? 12:17

A Give me a moment to find this, please.

So I'm referring to Salah, page 31, beginning at line 26, where it says "Preferably, no measurements are taken on the teeth to bring the acquisition apparatus into the matching position." 12:19

Q Looking at that line that you just read, Salah is talking about getting the camera in the correct position to take the image, correct?

MR. BLYTHE: Objection to form.

THE WITNESS: Give me just a minute to review the context around that line so I can appropriately answer that question. 12:20

Can you repeat your question, sir?

BY MR. ARGENTI:

Q Sure. 12:21

Looking at that line that you just read, Salah is talking about the getting the cameras in the correct position to take the image, correct?

MR. BLYTHE: Same objection.

THE WITNESS: So I believe Salah is talking about bringing the acquisition device, the acquisition apparatus, into the specified position. 12:21

BY MR. ARGENTI:

Q That's an alignment issue, right?

A Can you clarify what you mean by "alignment issue"? 12:21

Q Aligning the image acquisition device with the subject to be photographed.

A I don't think I would phrase it that way.

Q Why not? 12:22

A I don't feel like the word "alignment" captures accurate -- is -- is the word that I would use to describe the process here.

Q What's the distinction you would make between "alignment" and the process that's described? 12:22

A So I believe that this is a positioning, which is moving the acquisition apparatus into a location in space relative to -- moving the acquisition apparatus into an appropriate location in space and I don't believe "alignment" fully captures 12:23 that.

Q When Salah says that "Preferably, no measurements are taken on the teeth" in that sentence, it makes no mention of assessing image quality, does it? 12:23

A I believe that this sentence refers to bringing the acquisition apparatus into a "matching position."

Q So Salah isn't talking in that sentence about determining whether the image that's captured 12:24 is too blurry, right?

A I don't see any reference to "blurry image" in this one sentence that I've identified for you.

Q Salah also isn't talking about whether the teeth are obscured in the image, right? 12:24

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MR. BLYTHE: Objection to form.

THE WITNESS: So Salah makes no explicit mention in this sentence of whether or not teeth are obscured. But given a defined position of the acquisition apparatus relative to retractors in a 12:25 patient mouth, I believe that would provide indirect information about what teeth would and would not be obscured; so I think that there may be some implicit -- there may -- I believe there's something implicit here about whether teeth are obscured. 12:25

BY MR. ARGENTI:

Q Is that something that you've discussed with a dental professional?

A I've discussed with Dr. Kusnoto that in different orientations of an acquisition device, some 12:25 teeth are visible and some teeth are obscured.

Q Are there -- are there ways that teeth in an image could be obscured by virtue of something other than orientation?

MR. BLYTHE: Objection to form. 12:26

THE WITNESS: So clearly there are ways that things could be obscured; if, for instance, someone stuck their hand in front of the patient's mouth, but I'm not sure whether those are reasonable scenarios such that they're orthodontically relevant. 12:26

BY MR. ARGENTI:

Q That's not what Salah is talking about in this sentence at least, right?

A Can you clarify that question?

Q You just said there are ways in which 12:26 "things could be obscured, for example, if someone stuck their hand in front of the patient's mouth," but you're not sure that they're orthodontically relevant.

And I'm saying it's also not what Salah is 12:27 talking about in that sentence, correct?

MR. BLYTHE: Objection to form.

THE WITNESS: Salah --

I don't believe that Salah is talking about someone sticking their hand in front of their mouth 12:27 or a patient's mouth in this sentence.

BY MR. ARGENTI:

Q What's the basis of your understanding that the image being obscured by a hand or some object is not orthodontically relevant? 12:27

A No. I said that I didn't know. That -- that's a question that I think goes to orthodontic expertise.

Q Did you talk with Dr. Kusnoto about types of ways that images could be obscured and whether or not 12:28

they would be orthodontically relevant?

A I did not talk with him about the likelihood of hands or other objects being inserted between an acquisition device and the teeth and potentially obscuring. That wasn't a scenario we considered. 12:28

Q What scenarios regarding the image being obscured did you consider with Dr. Kusnoto?

A We talked about different standard orthodontic photos that -- the standard clinical set of orthodontic photos and we talked about the 12:28 visibility of teeth in those -- in those standard photos which are taken from different spatial orientations.

Q But did you specifically talk about ways in which those images might be obscured? 12:29

A By things other than teeth, is that what you're asking me?

We talked about ways in which those images might be obscured by teeth. And -- let me -- let me rephrase that question -- that answer, please. 12:29

We talked about how, in those standard views, some teeth would be obscured by other teeth and by the structures of the mouth and face.

Q And did you discuss which of those ways of obscuring the teeth that you're trying to capture 12:30

would be orthodontically relevant and which wouldn't?

MR. BLYTHE: Objection. Form.

THE WITNESS: I'm not sure if I understand that question. Can you -- can you clarify that question for me? 12:30

BY MR. ARGENTI:

Q You said you discussed with Dr. Kusnoto how, in those standard views --

A Uh-huh.

Q -- some teeth would be obscured by other 12:31 teeth and by the structures of the mouth and face.

And I'm asking did you discuss whether some of those ways of obscuring the image would be orthodontically relevant and some others might not be? 12:31

A I don't think that in the context of that discussion that I had with Dr. Kusnoto that orthodontic relevance, as you phrased it, was -- was a concept that was explicitly considered.

What I understood from Dr. Kusnoto was that 12:32 the reason that there is multiple photographs in a standard set of photographs was because, in general, you can't see all aspects of all teeth from a single image. It's a multiple image that --

Q I think I'm starting to understand it. 12:32

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So you need to take it from different angles, different views, to capture all the teeth; is that right?

A So I understood from Dr. Kusnoto that there was a standard set of orthodontic photos and that 12:32 those are acquired from different standard locations relative to the patient's mouth to permit a full evaluation of the teeth.

Q So it's your understanding from talking to Dr. Kusnoto that in any particular image of the teeth 12:32 you're going to expect that some of the teeth are going to be obscured in the image, either because they're behind the teeth at the front of the view or they're on the other jaw, so you're talking about some obstructions that are expected in the standard 12:33 orthopedic -- orthodontic image capture; is that right?

MR. BLYTHE: Objection.

THE WITNESS: It was my understanding that -- it was my understanding that it's common for a standard 12:33 orthodontic photo to not represent all of the teeth in the mouth, for a single photo to not represent all the teeth in the mouth.

BY MR. ARGENTI:

Q Okay. And so to the extent -- 12:33

If we go back to that sentence of Salah talking about not taking measurements, to the extent that there are obstructions in play in what Salah is talking about, they would be expected obstructions by virtue of the particular view that's being captured; 12:33 is that right?

MR. BLYTHE: Objection to form.

THE WITNESS: Give me just a minute to think about that.

Can you repeat the question for me, please? 12:34

BY MR. ARGENTI:

Q Right.

So if we look back at that sentence that you had cited in Salah regarding not taking measurements of the teeth and we look at the issue that Salah is 12:34 raising, to the extent that that issue involves obstructions of the teeth they would be the expected obstructions and -- which is the reason that you need to take multiple views of the teeth; is that right?

MR. BLYTHE: Objection to form. 12:34

THE WITNESS: So to the extent --

Looking at this sentence on lines 26 and 27 at page 31, to the extent that -- that bringing the acquisition apparatus into a matching position implicitly describes teeth being obstructed, it would 12:35

be the expected obstructions by other teeth and structures of the mouth that is potentially -- that is implicitly described by bringing the acquisition apparatus into the matching position.

BY MR. ARGENTI: 12:35

Q And beyond the expected obstructions for any particular view angle that you're taking an image at, there could also be unexpected obstructions where something like a hand obscures the entire image to be captured, right? 12:35

MR. BLYTHE: Objection to form.

THE WITNESS: So that's, I think, the question that you asked me several minutes ago and you phrased it as could it happen. And it's certainly -- I think it's -- from common sense, it's possible that that 12:36 could happen but whether or not it's likely enough that that would happen, that it's worthy of consideration, I think that that's a question that goes to orthodontic expertise.

I don't -- I have -- I don't have personal 12:36 experience or expertise in taking these photos and so I don't know whether that's something that is conceivable but essentially never happens and is not worthy of, you know, consideration. Or whether it's something that is a -- you know, a likely 12:36

possibility.

BY MR. ARGENTI:

Q Let's turn to paragraph 79 of your declaration, please, on page 41.

A I am at paragraph 79. 12:37

Q Okay. And do you see in the second-to-last sentence where it starts "A POSA would have recognized that"?

A I see that section.

Q Could you read that sentence for me, please? 12:37

A "A POSA would have recognized that, in the context of the method in Salah, in which the patient's individual teeth are expected to move and may be in an unknown position relative to each other when the 'updated image' is acquired, a patient's 12:38 teeth could not be reliably used as 'registration marks' for aligning the acquisition apparatus so as to capture an 'updated image' according to such target acquisition conditions."

Q You don't mention Dr. Kusnoto in this -- in 12:38 this sentence, do you?

A Dr. Kusnoto's name does not appear in this sentence but I believe that elsewhere in my declaration --

Give me a moment, please, to refer to my 12:38

declaration.

So at the bottom of page 39, the declaration reads "I understand from Dr. Kusnoto that, during orthodontic treatment, the patient's teeth may be moved several millimeters." 12:39

Q What's the basis for your understanding in paragraph 79 that the patient's individual teeth in Salah "may be in an unknown position relative to each other before an 'updated image' is acquired"?

A The basis for -- the basis for me saying 12:40 that the patient's individual -- the patient's teeth may be in an unknown position is that they are expected to move.

Q So it's your understanding that that movement would be unexpected or unknown? 12:40

MR. BLYTHE: Objection to form.

THE WITNESS: It's my understanding from my discussions with Dr. Kusnoto that the purpose of the orthodontic treatment is to move the teeth. It's further my understanding from Dr. Kusnoto that the 12:41 teeth do not always move exactly according to plan or at a fully predictable rate and that's --

My understanding is that's the reason for these interim evaluations.

BY MR. ARGENTI: 12:41

Q How often does that occur?

A How often does what occur?

Q How often does it occur that the teeth do not always move exactly according to plan or at a fully predictable rate? 12:42

A I believe that's a question that goes to orthodontic expertise and I wouldn't want to speculate on that.

Q You don't state anywhere in your declaration that you understand from Dr. Kusnoto that the teeth 12:42 do not always move exactly according to plan or at a fully predictable rate, do you?

A I'm not aware of a sentence in my declaration that uses exactly those words and references Dr. Kusnoto. But my understanding of that 12:43 point comes from my discussions with Dr. Kusnoto.

Q What else in your declaration where you're testifying as an expert sets forth an opinion that is based on information you obtained from Dr. Kusnoto but you don't identify that? 12:43

MR. BLYTHE: Objection to form.

THE WITNESS: My general understanding of the dental and orthodontic context in which these processes --

My general understanding of the orthodontic 12:44

and dental context is informed by my discussions with Dr. Kusnoto; that where there's specific relevant points that came directly from Dr. Kusnoto, I have tried to highlight those with explicit indications.

BY MR. ARGENTI: 12:44

Q Right.

And we just identified one example where you make an assertion about how the teeth would move in an unexpected way and you don't identify that that comes from Dr. Kusnoto, but you're telling me today 12:44 that it did come from Dr. Kusnoto; so I'm asking you what other parts of your declaration are based on information from Dr. Kusnoto as opposed to your own expertise but you don't identify that.

MR. BLYTHE: Objection to form. 12:45

THE WITNESS: I'm not aware of other specific points in my declaration that come from Dr. Kusnoto, but if there are points of concern to you I'd be happy to look at them.

BY MR. ARGENTI: 12:45

Q So you're unable to identify any others but if we point them out to you you'd be happy to concede that, yeah, that's actually not based on your expertise?

MR. BLYTHE: Objection to form. 12:45

THE WITNESS: So, Mr. Argenti, I believe you were asking me, you know, what -- what other things are there and -- in the document and I'm telling you that I'm not aware of other -- other points in the document. 12:46

BY MR. ARGENTI:

Q Were you aware of this point in the document that we just discussed until I brought it to your attention?

MR. BLYTHE: Objection to form. 12:46

THE WITNESS: I was aware of this point in the document. I had not recognized that this was a statement based on orthodontic expertise that I understood from consultation with Dr. Kusnoto and that it was not explicitly referenced as such until 12:46 you brought it to my attention.

BY MR. ARGENTI:

Q Is it your understanding that a POSA, as of 2017, would not have been able to account for a tooth when aligning a camera to take a dental image? 12:47

MR. BLYTHE: Objection to form.

THE WITNESS: So you're asking me whether they would or would not have been able to, which I think is asking me whether it's an insolvable problem. And I don't think it's an insolvable problem but that -- 12:47

but I think really the clearer thing here is motivation.

And I think that a POSA would choose to perform the acquisition in the way that avoided as many problems as possible. And I believe that having 12:48 to account for movement of the teeth would be an additional complication, an additional source of complexity and an additional potential source of inaccuracy. And I believe that's why Salah says that preferably you don't do that. 12:48

MR. ARGENTI: We are past the 12:30 point where I had suggested a lunch stop; so I think it's probably time for a break.

THE WITNESS: Okay.

MR. BLYTHE: Okay. Works for me if for you. 12:48

THE WITNESS: I'm sorry?

MR. BLYTHE: Works for me if for you.

THE WITNESS: Yeah. That sounds -- that sounds good.

What's a good duration for lunch? 12:49

MR. ARGENTI: We can go off the record.

(Lunch recess.)

BY MR. ARGENTI:

Q Dr. Mongan, we're going to turn now to the Carrier prior art. And in your declaration, your 01:31

analysis focuses on the Carrier Provisional reference so that's what I'll focus on as well; so if you can take the Carrier prior art out, that's Exhibit 1006.

A Okay. I have Exhibit 1006 in front of me.

Q Great. 01:31

So Carrier describes using an overlay that provides an outline of teeth to line up a camera for image acquisition, right?

A So my understanding is that one of the things described in Carrier is using an overlay of 01:32 teeth.

Q Why don't we turn to page 50 of Exhibit 1006.

A I'm sorry, can you say that again?

Q 50. 5-0. Page 50. 01:32

A Got it.

Q This is the page that has Figures 3A and 3B on it.

A I see those figures.

Q These figures depict one type of overlay 01:32 that Carrier describes, right?

A I'd just like to look for the captions for these figures.

So my understanding is that these figures depict an overlay. 01:33

Q And in Figure 3A the overlay is offset below the corresponding upper dental arch, correct?

A That's how it appears to be, yes, the overlay is not well matched with the -- the teeth.

Q Whereas in Figure 3B the overlay and the teeth have been aligned or matched, right? 01:34

A So the caption for Figure 3B describes this as a situation where the overlay "approximately matches" with the patient's teeth.

Q And Carrier says that the alignment of the overlay and the teeth, as shown in Figure 3B, leads to the system determining that the conditions are right in the picture, correct? 01:34

A Can you direct me to where you're quoting from Carrier? 01:34

Q Sure.

We can take a look at paragraph 63 on -- I believe it's page 12.

A So I see that it says "Once the apparatus (e.g. software/application software) determines that the teeth are in alignment with the overlay, as shown in Figure 3B, the screen may display an indicator, such as, in Figure 3B, changing the color of the overlay from the first color to a second color (e.g., green, blue, etcetera) and/or automatically 01:34 01:35

taking the image."

Q And then it goes on in the next sentence to say that that determination that they are in alignment can be automatically done, right?

A I see that it says "the method or apparatus may automatically determine alignment between the overlay and the patient's teeth in a variety of ways." 01:36

Q Do you have any opinion regarding whether a dental professional would have preferred using registration marks on a retractor for an on-screen overlay when aligning a camera to take a picture of teeth? 01:36

A I -- I don't have an opinion about what the preference of a dental professional would be. 01:36

Q Did you ask Dr. Kusnoto about that?

A I don't recall that I did.

Q Do you have any opinion regarding whether a dental professional would have viewed physical registration marks or an on-screen overlay as preferable for guiding a patient to take a picture of their own teeth? 01:36

A Can you clarify what you -- what you mean by "physical registration marks" in this context?

Q For example, the registration marks on a 01:37

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retractor, a physical object.

MR. BLYTHE: Objection to form.

THE WITNESS: I -- I don't have an opinion about what the preference -- what the preference of a dental professional would be. 01:37

BY MR. ARGENTI:

Q Did you ask Dr. Kusnoto about that?

A I don't recall that I did.

Q In Figure 3B of the Carrier Provisional which, again, is back at page -- 01:37

A I have it here, thank you.

Q Okay. And in Figure 3B of the Carrier Provisional there's no retractor visible, correct?

A In Figure 3B I don't see anything on this image that I can identify as a retractor. I do note 01:38 that the lips appear retracted from the teeth so it may be that there is a retractor out of frame. But I don't see a retractor on this image.

Q Let's turn to page 55 of the Carrier Provisional, please. And look at Figure 7B. Okay? 01:38

A I'm on Figure 7B.

Q This is an another picture where an on-screen overlay is aligned with the teeth, correct?

A So there is an image that demonstrates an on-screen overlay and there are teeth in the image. 01:39

It's not clear to me that they are necessarily aligned.

Q The patient in Figure 7B is using a retractor, correct?

A On this image I see portions of a device 01:39
that appears to be retracting the lips and that would match my understanding of a retractor. Whether it's the patient using the retractor themselves or whether there is some other person such as a dental professional who's using the retractor is unclear to 01:40
me from this image.

Q In Figure 7B the camera screen is not capturing the entire retractor on the image frame?

A It appears that there are portions of the device retracting the lips that are outside the frame 01:40
of what's shown on the screen.

Q Why don't we turn to paragraph 105 of your declaration, please. This paragraph is part of the section which --

A Just give me just a second. 01:41

Q Okay.

A I'm there now.

Q Paragraph 105 of your declaration is part of a section in which you've testified that the Carrier Provisional does not disclose a method for patients 01:41

to use a mobile phone to capture dental images, right?

MR. BLYTHE: Objection to form.

THE WITNESS: So paragraph 105 appears within a section that's titled "Carrier is Limited by the Disclosure of the Carrier Provisional, Which Contemplates Use By Dental Professionals Not Patients." 01:41

BY MR. ARGENTI:

Q And in paragraph 105, consistent with that you say "In contrast, the Carrier Provisional only discloses a method for dental professionals, as opposed to the patient themselves, to use a mobile phone to capture 'high quality dental images'," right? 01:41 01:42

A Yes, I see that sentence in the declaration.

Q And then in the next paragraph, 106, you say that you have "reviewed Dr. Foroosh's cited evidence" that he's "'providing a mobile application on a mobile device associated with a patient' limitation in Element 1.1 of claim 1 of Carrier is supported by the Carrier Provisional," and then you have some cited portions of the Carrier Provisional, right? 01:42 01:42

A Yes.

Q One of those cited paragraphs of the Carrier 01:42

Provisional is paragraph 55, right?

A I see that at the top of page 58 there's a citation that is 54 through 55, yes.

Q And that's part of what you reviewed when considering and responding to Dr. Foroosh's opinions, 01:43 right?

A Yes.

Q Let's turn to paragraph 55 of the Carrier Provisional, please.

A I'm on paragraph 55. 01:43

Q In the first sentence it refers to capturing a patient image, right?

MR. BLYTHE: Objection to form.

THE WITNESS: In the first sentence -- the first sentence ends with "to assist in placement of the 01:44 camera to capture the patient image."

BY MR. ARGENTI:

Q Is it your understanding that when it refers to the "patient image" that's an image of the patient's teeth? 01:44

A Yes. My understanding is that this is referring to capturing an image of the patient's teeth.

Q And then in the next sentence in paragraph 55 it says that "the overlay may be 01:44

customized to the user's teeth."

Do you see that?

A I see that in the next sentence it refers to the "user's teeth."

I'd also like to point out that in my review 01:45
of this document, I identified that the term "user" is used inconsistently throughout this document. It's used in some contexts where it clearly refers to a doctor or dental professional; it's used in some contexts where it clearly refers to a patient; and 01:45
it's used in some contexts where it's unclear who it's referring to.

Q So is it your understanding that if the Carrier Provisional refers to the patient as a user in paragraph 55, that is negated by references 01:45
elsewhere in the Carrier Provisional to the user being a dentist?

MR. BLYTHE: Objection to form.

THE WITNESS: It's my understanding that the Carrier Provisional uses the term "user" 01:46
inconsistently and that there's no single consistent meaning of "user" that can be reasonably applied across the entire -- the entire document without logical inconsistency. And so what the meaning of "user" is in any particular location has to be 01:46

determined from context.

BY MR. ARGENTI:

Q Is it your understanding that the Carrier Provisional can only disclose its user being a dentist or a patient but not both? 01:46

A Can -- can you rephrase that for me?

Q Is it your understanding that the user in the Carrier Provisional has to be either a dentist or a patient, but that Carrier can't disclose that both could be the user? 01:47

MR. BLYTHE: Objection to form.

THE WITNESS: It's my understanding that user is -- the term "user" is used inconsistently throughout the document and that there are some instances where it means doctor or dentist exclusive 01:47 of patient; there are some instances where it means patient exclusive of doctor or dentist in their professional capacity; and there are some instances where it's less clear.

BY MR. ARGENTI: 01:48

Q I guess regardless of whether a particular instance of "user" is referring to a patient or a dentist, is it your understanding that the user throughout the Carrier Provisional is the one who is taking the photograph of the teeth? 01:48

A It's my understanding that the person taking the photograph of the teeth throughout the Carrier Provisional is a dental professional, not a patient. And that the term "user" is used inconsistently.

Q So it's your understanding that the person taking the image of the teeth is not always the one that Carrier refers to as the user? 01:49

A It's my understanding that there are places where Carrier uses the term "user" in a context that makes it clear that in that case it is referring to a patient but the -- when the -- but that the person who is taking the photograph is a dental professional exclusive of patient. 01:50

Q What is the user in the Carrier -- Carrier Provisional using if not the image acquisition device? 01:50

MR. BLYTHE: Objection to form.

THE WITNESS: I'm not sure what the authors intended, just why the authors used that -- that term. But I note that there are places where the term "user" is used in a context that makes it clear that it's exclusive of patient. 01:51

BY MR. ARGENTI:

Q If we look again at paragraph 55 and that second sentence that says "The overlay may be based 01:51

on a generic image of teeth, or it may be customized to the user's teeth," what is the user in that sentence a user of?

A I'm not sure what they're a user of.

Q So to reach your conclusions about what is 01:52 and is not disclosed in Carrier, you had to have an understanding of Carrier that was uncertain about what the user is?

MR. BLYTHE: Objection to form.

BY MR. ARGENTI: 01:52

Q Is that right?

A I think what -- the central issue that we're addressing here is who is acquiring the image, who's taking the picture. And so to have an understanding of that, I had to specifically look at who is 01:53 described as acquiring the image, who is described as taking the pictures.

Q In paragraph 55, if the "user" in the second sentence is the user of the camera image acquisition device, that means the patient is taking a picture of 01:53 their own teeth, right?

A Can you repeat that, please?

Q In paragraph 55, if the "user" in the second sentence is a user of the image acquisition device, that means the patient is taking a picture of their 01:53

own teeth, right?

MR. BLYTHE: Objection to form.

THE WITNESS: I'm not sure that's necessarily true. I -- it --

One possible explanation for the 01:54
inconsistent use of the term "user" is that they meant it to refer both to the person operating or using the acquisition device in some contexts and the person on whom the acquisition device is used in other contexts. 01:55

BY MR. ARGENTI:

Q Can you point me to any example in the Carrier Provisional where it clearly discloses that second possibility that you just laid out?

A Where it discloses that the user is clearly 01:55
a patient?

Q Well, no. It's not about whether it's a patient or a doctor, it's about whether they are using the term "user" to refer to someone who the device is being used on. 01:55

MR. BLYTHE: Objection to form.

THE WITNESS: I think that a POSA reading this specification of the provisional here as a whole, given the multiple references to doctors taking pictures and to user -- the term "user" in sections 01:57

where it's talking about pictures being acquired, photographs being acquired, being equated with dental professionals.

And also understanding that the invention that is being described and the applications of it 01:58 would, in many cases, be impossible for someone to operate on themselves, would understand that the -- would understand that in contexts where the term "user" refers to a patient, it may be that that term was selected because that's the person on whom the 01:58 device is being used, but not that that person is using it to acquire images of themselves.

BY MR. ARGENTI:

Q So do I have it right then, Dr. Mongan, that you are unable to direct my attention to any portion 01:59 of the Carrier Provisional where it describes or explains that it is using the term "user" to refer to someone that the image acquisition device is being used on rather than the person using the image acquisition device? 01:59

A So as I've noted, the Carrier Provisional is inconsistent in its use of the term "user." It, in several places, such as paragraph 56, explicitly defines the "user" as a dental professional; for instance, it says the camera is typically held by the 01:59

user, e.g., dentist, orthodontist, technician. I don't have an explicit section of this that describes "user" as someone on whom the device is used.

Q Is it your understanding that in paragraph 56 where it says "e.g." and gives examples, 02:00 that is defining the term "user"?

A I believe that a POSA reading this would understand that parenthetical "e.g." as indicating the scope of roles that are included -- the indication of the scope of roles that are included in 02:00 the people who might be the user who the camera is typically held by.

Q Okay. So to reach your conclusions about the Carrier Provisional you had to not only interpret the term "user" to mean the one that it is being used 02:01 on but also to interpret an e.g. list of examples to be a narrowing definition limited to those examples; do I have that right?

MR. BLYTHE: Objection to form.

THE WITNESS: No, I don't think that's exactly 02:01 what I said.

I said that I think that a POSA would be informed by what was meant by "user" by that parenthetical.

And in the context of multiple other 02:01

statements in the Carrier Provisional describing doctors taking photographs, and with the understanding that for many of the types of photographs that are described as being obtained, it would put the screen and the overlay in a position 02:02 where it couldn't reasonably be seen by the patient, that a POSA would understand that it was a doctor taking the pictures, a doctor or dental professional.

BY MR. ARGENTI:

Q So if you wrote the disclosure in the 02:02 Carrier Provisional regarding the doctor being the one taking the picture, you are interpreting other aspects of the disclosure to the contrary in a way that's consistent, then; is that right?

A I'm sorry, I didn't understand that 02:02 statement.

Q So because there are portions of the Carrier Provisional that you interpret as disclosing the doctor taking the picture of the patient, you are interpreting other portions of the Carrier 02:02 Provisional in a way that is consistent with that understanding, even if those other portions don't say that?

MR. BLYTHE: Objection to form.

BY MR. ARGENTI: 02:03

Q Is that right?

A I -- I -- I -- I'm still struggling a little bit to understand that -- that statement.

Q That's okay. We can move on.

Let's take a look at page 97 of your 02:03 declaration, please.

A I'm on page 97.

Q In paragraph 159, in the first bullet point, you say that "Dr. Foroosh proposes that a POSA would have been motivated to train and use Maninis's 02:03 COB neural network to detect semantic contours (i.e., contours labeled as associated with a particular object), but Maninis's COB neural network could not be trained and would not perform in the proposed manner." 02:04

Did I read that correctly?

A Yes, I believe you did.

Q Dr. Foroosh doesn't actually use the term "COB neural network" when discussing Maninis, does he? 02:04

A Can you -- can you point me to where you're -- where Dr. Foroosh refers to this so that I can --

Q Well, that would be difficult because he doesn't refer to the term "COB neural network" in his 02:04

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declaration.

A Certainly.

I believe what you said was Dr. Maninis -- Dr. Foroosh doesn't use the term "COB neural network" when he refers to Maninis's work; so I think, in 02:04 order to answer that question, I need to look at where he refers to Maninis's work.

Q I will be more broad and refer you to his entire declaration --

A Okay. 02:05

Q -- and see if you will agree with me that Dr. Foroosh does not use the term "COB neural network" in his declaration, does he?

MR. BLYTHE: Objection to form.

THE WITNESS: So on paragraph 61 of 02:07 Dr. Foroosh's declaration, Exhibit 1002, it begins --

And I may not be pronouncing these names correctly.

-- "Kevis-Kokitsi" -- "Kevis-Kokitsi Maninis, et al., published Convolutional Oriented 02:07 Boundaries: From Image Segmentation to High-Level Tasks"; so the Maninis article that he's referring to is titled "Convolutional Oriented Boundaries."

Furthermore, on page 34, at the beginning of paragraph 67, it says "The public availability of 02:07

Maninis" --

So "Maninis" is the term that he uses in referring to this work.

-- "to interested persons prior to July 21, 2017 is also corroborated by archived web pages of both the Archive.org and the authors of Maninis. As of May 3, 2017, the university website featuring the authors' convolutional oriented boundaries software included a link"; so from this I understand that when he uses the term "Maninis" he's referring to the convolutional oriented boundaries or COB network described in that article. 02:08 02:08

BY MR. ARGENTI:

Q But he doesn't use the term "COB neural network," right? 02:08

A So when I use the term "COB," I use that as an acronym or an abbreviation for convolutional oriented boundaries.

Q "COB" is not the term I'm asking you about, Dr. Mongan. 02:09

A I wasn't quite finished answering there.

When I use the term "COB," I'm referring -- I'm using that as an abbreviation for convolutional oriented boundaries.

Dr. Foroosh refers to the software of 02:09

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Maninis as convolutional oriented boundaries software in paragraph 67.

And then in paragraph 68 he describes this as Maninis uses a neural network trained on precisely annotated images to detect contours; so while in 02:10 my -- in looking at this here on the spot, I don't see the exact phrase "COB neural network," it's clear to me that when he says "Maninis" he's talking about the same thing that I'm talking about when I say "Maninis's COB neural network." 02:10

Q Maninis itself never uses the term "COB neural network," right?

A If you'll give me a moment, I'll look at the Maninis.

Q Actually, let me ask a different question. 02:11

Where does the term "COB neural network" come from, Dr. Mongan?

A It's a term that I use to describe the network that is introduced in the Maninis paper.

Q So it's a term that you introduced, right? 02:11

MR. BLYTHE: Objection to form.

THE WITNESS: What do you mean by I "introduced" it?

BY MR. ARGENTI:

Q Maybe we can go back now to the Maninis 02:11

paper.

Maninis doesn't use the term "COB neural network," right?

A I'll look at the Maninis paper.

Can you remind me which exhibit number that is? 02:12

Q That's 1007.

A Thank you.

So on paragraph 2 on the first page of Exhibit 1007 it says "This paper proposes Convolutional Oriented Boundaries (COB) a generic CNN." 02:13

And "CNN" had previously been defined in the first paragraph as "Convolutional Neural Network."

Q It says it's "a generic CNN architecture," right? 02:13

MR. BLYTHE: I'm sorry, I couldn't hear that, Counsel.

Could you please repeat that?

THE WITNESS: Yes. 02:13

BY MR. ARGENTI:

Q In that sentence it says that it's "a generic CNN architecture," right? I think Dr. Mongan split that phrase out.

A The next word following "CNN" is 02:13

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"architecture," yes.

And then subsequently refers to "Convolutional Oriented Boundaries" which is a generic convolutional neural network architecture, as COB; so in my declaration, just to make clear what 02:13 "COB" refers to, I'm referring to it as a C- -- I'm referring to it as the COB neural network. I -- I don't see that there's a substantive difference between my phrase "COB neural network" and "COB" in the Maninis manuscript. 02:14

Q So when you are referring to -- actually, let's take a look at page 71 of your declaration, paragraph 124.

A I'm there.

Q And in that first sentence it says 02:14 "Kevis-Kokitsi Maninis et al.'s article entitled 'Convolutional Oriented Boundaries: From Image Segmentation to High-Level Tasks' proposes a technique, which the authors refer to as Convolutional Oriented Boundaries ('COB'), for 02:15 determining boundaries in an image using a convolutional neural network ('CNN') (referred to in this declaration as the Maninis 'COB neural network')."

Did I read that right? 02:15

A I believe so.

Q So when you introduced that term "Maninis COB neural network," is that the COB technique that you're referring to?

A Are you differentiating "technique" from "architecture"? 02:16

Q I'm trying to figure out what exactly you think the "COB neural network" is.

Is it the technique that you refer to in that sentence in paragraph 124 or is it the technique when using a convolutional neural network, CNN? What is the "COB neural network," this term that you introduce? 02:16

A The term --

When I use the term "COB neural network," I am referring to what is referred to as "COB" in the Maninis manuscript. 02:17

Q So the COB is the generic CNN architecture; is that right?

MR. BLYTHE: Objection to form. 02:17

THE WITNESS: So I'm referring --

I'm using a term that I consider to be equivalent to the term "COB" used in the Maninis manuscript. And in the second paragraph, the manuscript states that this "paper proposes 02:17

Convolutional Oriented Boundaries (COB), a generic CNN architecture."

BY MR. ARGENTI:

Q And so when you refer to a "COB neural network," that's what you're referring to, "Convolutional Oriented Boundaries, a generic CNN architecture"; is that right? 02:18

A I'm referring to the same concept identified as COB in the Maninis manuscript.

Q And I'm trying to figure out exactly what that is. 02:18

That sentence in Maninis in the second paragraph under the "Introduction" goes on to say that "we show how it translates top performing base CNN networks into high-quality contours," right? 02:18

A I see where it says that.

Q So is the "COB neural network" term that you use throughout your declaration intended to include any of those top performing-based CNN networks?

A The term that I'm using is -- 02:19

The "COB neural network" term that I'm using is synonymous with the "COB" term in Maninis.

Q And is it your understanding that the "COB" term in Maninis is used consistently with this sentence that we've been looking at throughout? 02:19

MR. BLYTHE: Objection to form.

THE WITNESS: So one of the things that I've identified in my extensive review of Maninis is that it's not a particularly clearly written paper. And so I'm -- I'm not sure whether or not -- 02:20

I would need to take some additional time to consider whether this single sentence that you're pointing to in Maninis fully characterizes how the term "COB" is used throughout the paper or not.

BY MR. ARGENTI: 02:20

Q So which part of the paper are you saying your definition is consistent with?

MR. BLYTHE: Objection to form.

THE WITNESS: I'm saying that there is a term introduced by Maninis in this manuscript and I'm 02:21 using the term "COB neural network" as equivalent to their term "COB."

BY MR. ARGENTI:

Q Right.

But you're also telling me that you're not 02:21 sure if "COB" is used consistently throughout Maninis, which is fine, I'm not asking you to commit to that without further review.

But what usage of "COB" in Maninis is equivalent to your term "COB neural network"? 02:21

MR. BLYTHE: Objection to form.

THE WITNESS: So I believe you're asking me to identify a single place in Maninis where a single definition is provided for "COB" that I can accept as a complete definition of the term. And based on the 02:22 nature of this manuscript, that is very complex and not clearly written, I can't off the --

I haven't previously considered whether there was a single sentence or single location that fully describes everything that they mean by "COB" 02:22 and I would need additional time to consider whether there is any single place that fully describes the scope of how they use "COB" or whether, in fact, it requires multiple usages to capture the full scope of what -- of what they use it to mean. 02:23

BY MR. ARGENTI:

Q Respectfully, Dr. Mongan, that's not what I was asking you; I wanted to let you get your whole answer out but that was not my question.

My question and this line of questions goes 02:23 to what do you mean with this term "COB neural network" that you coined for your declaration. And you've told me that you mean it to be consistent with the usage of the term "COB" in Maninis; so I'm trying to get at what your understanding of that term is as 02:23

a way of understanding what you mean by this term "COB neural network" in your declaration.

And if you are unable to explain what Maninis means by the term "COB" in its paper, then how can that be what you mean with reference to this "COB neural network" in your declaration? 02:24

A Okay.

MR. BLYTHE: Let me object to that question.

I'll object to form, if that's a question.

BY MR. ARGENTI: 02:24

Q It was a question, Dr. Mongan.

A Okay.

Q But I'll rephrase it.

A Thank you.

Q You use a term "COB neural network" in your declaration that doesn't appear in Dr. Foroosh's declaration or in the Maninis paper or any of the other prior art. 02:24

If Maninis itself, in your view, is unclear what it means by the term "COB," how can you anchor your own term "COB neural network" to Maninis's COB? 02:24

MR. BLYTHE: Objection to form.

THE WITNESS: I'm still trying to understand whether the question here is whether there's a difference between "COB neural network" and "COB," 02:25

and whether you're objecting to me referring to this as "COB neural network" rather than just "COB" as it's referred to in the Maninis manuscript, or whether you're asking me to give a description of what "COB" means in the Maninis manuscript. 02:25

BY MR. ARGENTI:

Q I suppose all of the above but let's take those one at a time.

If the term that you coined, "COB neural network," for your declaration is intended to be 02:25 equivalent to the Maninis's usage of the term "COB," why not use just the term "COB"?

MR. BLYTHE: Objection to form.

THE WITNESS: I thought it would make it clearer to people reading my declaration to use a term that 02:26 indicated what COB was rather than to just use an opaque acronym of COB.

BY MR. ARGENTI:

Q So let's look again at that first sentence of the second paragraph under "Introduction" on 02:26 Maninis.

A First sentence, second paragraph, is that what you said?

Q The same one we looked at before.

A Yes. 02:26

Q Where it says that "This paper proposes Convolutional Oriented Boundaries (COB), a generic CNN architecture"; so "COB" is at least a generic CNN architecture, right?

A That's how it's described in this sentence, 02:27 yes.

Q And then it goes on to say "and we show how it translates top performing base CNN networks into high-quality films"; so my question then would be when you are referring to the term "COB neural 02:27 network" is it just a generic CNN architecture that Maninis talks about in the first part of that sentence or is it the generic CNN architecture that has been used to translate a base CNN network?

A Okay. I think that's not a well-formed 02:27 question because I don't think those are separable concepts.

So if we look at Figure 2 of Maninis, which is captioned "Our deep learning architecture," we see that the base CNN, that's the portion inside the red 02:28 dashed box, is a component of the architecture.

Q There are a number of different based CNNs that could be used, right?

A More than one base CNN could be used, not -- let me refine that. 02:29

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There's more than one option for which base CNN could be used.

Q Which base CNN could be used in the COB neural network, as you understand the term?

A There is more than one possible choice for which base CNN could be used within the COB neural network. 02:29

Q And what specifically are the "top performing base CNN networks" that Maninis refers to in that sentence on the first page that we've been looking at? 02:30

A I believe they're referring to VGGNet and ResNets 50.

Q What about PSPNet?

A Would you like me to -- would you like to direct me to -- 02:31

You're referring to PSPNet at the bottom of page 9?

Q Sure. That's one example.

Is that PSPNet at the bottom of page 9 one of the "top performing base CNN networks" that they refer to in the second paragraph of the first page? 02:31

A No, it's not.

Q What about Fast R-CNN, is that one of the top performing base CNN networks that they're 02:32

referring to on the first page?

A No, I don't think so.

Q Let's turn to page 2 of Maninis. And at the end of the first paragraph on that page, the one that carries over from page 1, do you see where Maninis 02:33 says "We have also studied the effects of COB when coupled with well-known pipelines, showing that injecting COB detections to them lead to improvements on Semantic Segmentation and Object Detection."

A I see that sentence. 02:33

Q What are the "well-known pipelines" that Maninis injected COB detections into?

A I believe the "well-known pipelines" that they are referring to are Dilated Network, PSPNet and Fast R-CNN. 02:34

Q Let's go back to that sentence in the second paragraph on page 1 where it talks about "translates top performing base CNN networks."

You identified VGGNet and ResNet as examples. 02:34

Are there any others that you've identified that Maninis talks about?

MR. BLYTHE: Objection to form.

THE WITNESS: I believe those two are at least the primary that they test as base networks within 02:35

their network architecture.

BY MR. ARGENTI:

Q And so when you are referring in your declaration to the "Maninis COB neural network," are you referring to the COB generic CNN architecture 02:35 that has been used to translate either VGGNet or ResNet?

A I'm referring to what Maninis describes as "COB," which I understand from Maninis to be what's described -- what's diagrammed and outlined in 02:36 Figure 2, captioned "Our deep learning architecture," and which includes within it a base CNN. And that two example base CNNs that they tested within this architecture were ResNet 50 and VGGNet.

Q If we look again at page 2 of Maninis, the 02:36 last full paragraph on that page, the last sentence of that paragraph reads "In this work, we present results using both VGGNet and ResNet, showing that COB is modular and can incorporate and benefit from material future improvements in the base CNN." 02:37

Do you see that?

A I do see that.

Q What's your understanding of what Maninis means when it says that "COB is modular"?

A My understanding is that they are indicating 02:37

that their network architecture is not dependent on any specific base CNN and that there are multiple potential choices for the base CNN. And that future CNNs that have the form of image classification networks could be used as the base CNN in their 02:38 architecture.

Q Now, in your opinion -- sorry. Strike that, start over.

In your declaration, you state the opinion that what you call the "Maninis COB neural network" 02:38 is incapable of classifying objects in any direction, right?

A Can you direct me to the statement you're referring to just so that I make sure that we're looking at the same thing? 02:38

Q If we look at paragraph 170.

A So I see that it -- so in 17- -- in paragraph 170 I state that the Maninis COB neural network is "capable of identifying" contours in an image but not what kind of object those contours 02:39 represent.

Q So in your view, the Maninis COB might be able to identify regions in an image likely detecting -- depicting objects but it can't determine what those objects might be; is that right? 02:39

A Effectively what it can do is draw that -- draw the boundaries of things, but it doesn't know what those things are, or identify what those things are in its output.

Q So if we look at the sentence on page 2 of Maninis in the first paragraph, the sentence that reads "We have also studied the effects of COB when coupled with well-known pipelines, showing that injecting COB detections to them lead to improvements on Semantic Objectification and Object Detection." 02:40

Do you remember that sentence?

A I do remember that sentence.

Q Does your definition of "COB neural network" exclude Maninis's disclosure of injecting COB detections into well-known pipelines? 02:40

MR. BLYTHE: Object to form.

THE WITNESS: So -- so my use of the term "COB neural network" is synonymous with the term "COB" in Maninis. And looking at the sentence in Maninis that you've directed me to, they talk about coupling COB with different networks or different pipelines that are not themselves COB. 02:41

BY MR. ARGENTI:

Q They talk about injecting COB networks to lead to improvements; so in your view that is outside 02:42

the scope of your definition of "COB neural networks," right?

MR. BLYTHE: Objection to form.

THE WITNESS: So they talk about taking their COB and taking the -- the detections -- the output of 02:42 their COB and using those either as an input or in combination with the results of other networks.

So my term of "COB neural network" would include the part of that coupling that is COB, just as Maninis has used the term "COB," but not the part 02:43 of that coupling that is not COB.

BY MR. ARGENTI:

Q And I want to go back to an answer that you just gave because I think I'm going to quibble with it a little bit. 02:43

You gave the answer that your term "'COB neural network' is synonymous with 'COB' in Maninis," except that earlier you testified that you weren't sure that Maninis uses "COB" in a consistent way throughout. And that you intended your term 02:43 "COB neural network" to be equivalent to COB but you couldn't actually say that it is; so are you changing that testimony now?

MR. BLYTHE: Objection to form.

Objection to form. 02:43

THE WITNESS: So I believe what I said was that I wasn't sure that it was a single statement in Maninis that captured the entire scope of what "COB" means. And I understood that what you were asking me for was to direct you to a single statement 02:44 that fully defined what "COB" means, a single sentence in Maninis, and that's what I was uncertain if I could find for you.

BY MR. ARGENTI:

Q And I believe I explained that that's not 02:44 what I was asking you, and I'm still not asking you that, but we can move on.

So if I understand it right, your view that the Maninis COB neural network can't determine what objects in an image might be is the basis of your 02:44 opinion that the combinations Dr. Foroosh proposes would be inoperable, correct?

A I think that's one of the -- one of the aspects of Dr. Foroosh's combination that is inoperable. 02:45

Q I'm looking at the section with the heading "A POSA WOULD HAVE RECOGNIZED THAT DR. FOROOSH'S PROPOSED COMBINATION IS INOPERABLE."

Is there anything else, any other aspect of inoperability that you address? 02:45

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A I believe there is, just give me a minute to locate the relevant section here.

So in addition to the form of the output or, you know, what -- what analysis is performed by the Maninis COB neural network rendering the combination 02:48 inoperable, Dr. Foroosh's combination proposes to run on a cell phone. And the performance of Maninis COB neural network would not be sufficient to render it -- would render it inoperable for the purposes that Dr. Foroosh describes in terms of combination 02:48 with Carrier for it to be able to provide feedback on an alignment with an overlay.

Q Understood.

For now, let's just focus on paragraphs 168 to 172 of your declaration. 02:49

A Okay.

Q The section on inoperability, your opinions in these paragraphs are all about the inability of the Maninis COB neural network to classify objects; is that right? 02:49

A These paragraphs discover the inability of the Maninis network -- the Maninis COB neural network to identify the class Maninis type of object that it draws boundaries for.

MR. BLYTHE: Before you go on to the next 02:49

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question, Matt, we've been going about an hour and 20; want to take a five-minute break here?

MR. ARGENTI: I was just about to suggest the same thing.

MR. BLYTHE: All right. 02:49

THE WITNESS: Okay. Five minutes; so we'll be back at 5 till?

MR. ARGENTI: Sure.

THE WITNESS: Thank you.

(Off the record.) 02:50

BY MR. ARGENTI:

Q Okay. Let's turn now to page 78 of your declaration, Dr. Mongan, and look at paragraph 135.

A Yes.

Q In this paragraph you make a distinction 02:56 between what Maninis calls "Low Level Applications" and "High Level Applications," right?

A The first sentence of paragraph 135 identifies that Maninis distinguishes between "Low Level Applications" in Section 5 and 02:56 "High Level Applications" in Section 6.

Q And in that next sentence you go on to say "The low-level applications are those that can be achieved with Maninis's COB neural network on its own," right? 02:57

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A Yes.

Q And you go on to say that "including 'generic image segmentation' and 'object boundary detection'."

Do you see that? 02:57

A Yes. The ending part of that sentence is "including 'generic image segmentation' and 'object boundary detection'."

Q What is "generic image segmentation"?

A "Generic image segmentation" in -- in this 02:57 context means segmenting an image into things without distinguishing what those things are.

Q What is "object boundary detection"?

A "Object boundary detection" is a closely related concept which is identifying where the 02:58 borders of those things are; so really what we're talking about here with segmentation versus boundaries is whether you're identifying all of the pixels that represent the thing on the image, which is segmentation, or the pixels that represent the 02:58 edge of the thing, which is boundary detection.

Q If you've identified the pixels that represent the edge of the thing, haven't you also then implicitly identified the rest of the pixels that comprise the thing? 02:58

A They're very closely related concepts and it's fairly straightforward to --

If you have one representation it's fairly straightforward to convert to the other, but they're not identical. 02:59

Q Are there any other low-level applications in Maninis other than generic image segmentation and object boundary detection?

A I believe contour orientations would also fall into that category. 03:00

Q What is "contour orientation"?

A My understanding is that contour orientation is for a particular boundary pixel classifying the general direction in which that boundary is running.

Q In paragraph 135 of your declaration you go on to say that the low-level applications are accomplished "without distinguishing the semantics," right? 03:01

A So I have a sentence that says "As Maninis explains, with 'object boundary detection'...'the goal is to detect the boundaries of the objects that belong to the 20 classes of PASCAL without distinguishing the semantics'"; is that the sentence you're referring to? 03:01

Q Right. 03:01

And then you explain in the next sentence that "A POSA would have understood that 'without distinguishing the semantics' means without identifying what object is contained within the boundary," right? 03:02

A Yes, that's the next sentence.

Q So do I understand it correctly, then, that in your view "distinguishing the semantics" refers to identifying what object is contained within a boundary in an image? 03:02

A Yes, identifying the -- the class of the -- of the object.

Q Then my next question was is another way to refer to that as "object classification"? It sounds like it is, correct me if I'm wrong. 03:02

MR. BLYTHE: Object to form.

THE WITNESS: So "segmentation," as we've described, is identifying the things in -- in an image. And "semantic segmentation" is going beyond just identifying that it's a thing but for each thing 03:02 that is identified, identifying what class that thing falls into.

BY MR. ARGENTI:

Q So in the context of Maninis, is it your understanding that distinguishing the semantics is 03:03

necessary in order to perform the object classification?

A I don't think that's a well-formed question.

Q How so?

A Can -- can you repeat or rephrase your 03:03
question?

Q Sure.

I think you agreed that you understand Maninis's reference to "distinguishing the semantics" to refer to identifying what object is contained 03:03
within the boundary and in the image, right?

A "Distinguishing the semantics" -- excuse me.

Detecting the boundaries without distinguishing the semantics is just identifying that there's a thing without identifying what type of 03:04
thing it is.

Identifying semantic boundaries would be identifying the boundaries of things and also what kind of thing it is.

Q Is it possible to identify what kind 03:04
of thing it is without detecting the semantic boundaries?

MR. BLYTHE: Objection to form.

THE WITNESS: So there are --

If you do object boundary detection without 03:05

distinguishing the semantics, you don't know what type of thing it is.

BY MR. ARGENTI:

Q Let's turn back to the Maninis paper, Exhibit 1007. 03:05

A Yes, I'm on that page.

Q Actually, before we dig into the paper, let me ask one more question.

Is distinguishing semantics a high-level application in Maninis? 03:05

MR. BLYTHE: Objection to form.

THE WITNESS: So in the Maninis manuscript, Section 6 is titled "Experiments on High-Level Applications." And within that section, Section 6.2 is titled "Semantic Boundaries and Semantic 03:06 Segmentation."

BY MR. ARGENTI:

Q And does the discussion in Section 6.2 involve tests where they did distinguish semantics?

A So the -- the first sentence of that section 03:06 says "The task of Semantic Boundaries, introduced by 14, requires not only detecting the boundaries, but also associating a semantic class to them."

And I would highlight that that "associating" of a semantic class is not performed by 03:07

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COB but is performed by the other, as Maninis describes them, pipelines that they -- well-known pipelines that they couple to.

Q But it is performed in these tasks that they describe in Section 6.2; is that correct? 03:07

A In Section 6.2 they describe taking neural networks or neural network-based pipelines developed by other authors that are capable of doing semantic boundaries or semantic segmentations and improving the precision of those results by coupling them with 03:08 the COB that's developed in Maninis.

Q Right.

And so to show that they could do that, they just needed the exact run test that distinguished the semantics, correct? 03:08

MR. BLYTHE: Objection to form.

THE WITNESS: So Maninis and his coauthors report results in this manuscript that involve semantic segmentation. And my understanding is that in order to obtain those results, they would have 03:09 obtained the code that does the semantic segmentation from the other investigators who developed it and then run that, both separately and in conjunction with the COB that -- the COB neural network that they introduce in this manuscript. 03:09

BY MR. ARGENTI:

Q Is there any distinction between the term I used in my question, "distinguishing the semantics," and the term that you used in your answer, "semantic segmentation"? 03:09

When you refer to "semantic segmentation," is that "distinguishing the semantics"?

A The process of semantic segmentation is a segmentation process that distinguishes semantics for those segments. 03:10

MR. BLYTHE: I'm sorry, I don't see it on the transcript, just objection to form on that last question.

BY MR. ARGENTI:

Q Okay. So we jumped ahead to talk about Section 6. Let's turn back and look at Section 5 which starts on page 5, Dr. Mongan, of Maninis. 03:10

Section 5 has the heading "Experiments on Low-Level Applications," right?

A I see that heading. 03:10

Q So this is the section of Maninis that describes the low-level applications like generic image segmentation and object boundary detection; is that right?

A Yes, I believe so. 03:10

Q And if we turn to Figure 10, which is part of Section 5 on page 9, do you see that figure?

A I see Figure 10.

Q Let's focus on the rightmost column with the image of two sheep. 03:11

Do you see that?

A I see that.

Q And if we look at the caption from Figure 10, Maninis says the second row is an example of "Generic Image Segmentation" and the third row is 03:11 an example of "Object Boundary" detection, right?

A I see that in the caption, yes.

Q Okay. Can you walk me through those one at a time with reference to this figure?

What's happening to generate the generic 03:11 image segmentation result?

MR. BLYTHE: Objection to form.

THE WITNESS: Give me just a minute to review this because, as I said, this is a very complex manuscript and I want to speak precisely. 03:12

BY MR. ARGENTI:

Q Of course.

A So my understanding of Figure 10 is that the first row in color shows the source input images that are being processed. 03:14

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The second row shows the generic image segmentation results which are the results of applying -- of applying the COB as it was trained as discussed in Section 5.3 on the VOC trained dataset.

And the third row present the results of 03:15
row 1 as processed by the COB neural network as it was trained as described in Section 5.4 on data extracted from the PASCAL VOC 12 segmentation database.

Q Are those iterative results? 03:15

Did they first do the generic image segmentation and then do the object boundary detection on the results of the generic image segmentation?

A For row 3 for the object -- object boundary 03:16
results, my understanding is that those come directly from the COB that they describe in 5.4. I don't believe that --

It's not my understanding that row 3 represents running it through two different versions 03:16
of COB, if that's your question.

Q And at the end of the object boundary results process, the system has detected two discrete objects that correspond to sheep, right? It doesn't know that they're sheep but it's detected two objects 03:17

that correspond to sheep, right?

MR. BLYTHE: Object to form.

THE WITNESS: So in the lower right panel of Figure 3 we see that it has outlined two things, and you and I can correlate that to the original image. 03:17 And based on our human ability to recognize things in images, which is a capability that COB doesn't have, we can recognize that those outlines around things are sheep. But there would be no information in the output of the COB neural net that would identify 03:18 those as sheep, just as outlines of things.

BY MR. ARGENTI:

Q And if we compare the generic image segmentation results from the object boundary results, it looks like the generic image segmentation 03:18 results captured additional boundaries or contours that aren't reflected in the object boundary results; it looks like there might be a tree in the background and perhaps some stairs and then the ground under the sheep' feet. 03:18

Do you see those lines?

MR. BLYTHE: Objection.

THE WITNESS: I see -- I see additional -- I see in general more contours in row 2 than in row 3.

BY MR. ARGENTI: 03:19

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Q How is the object boundary results process able to discern between the two objects that are sheep and the other objects and eliminate the contours that aren't part of the two objects that are shown in the results? 03:19

A So I will preface this by saying that these convolutional neural networks are very complex and understanding why they produce a particular output is an active area of research and not something that is -- and not -- not well developed. 03:20

With that as preface, we can sometimes make reasonable estimations of why a neural network may perform one way or a different way; so here we have the same neural network architecture that was trained on two different datasets. 03:21

The training in row 2 that's labeled as "Generic Image Segmentation" is trained on the PASCAL Context as well as the BSDS 500 datasets.

At the bottom of page 5, Maninis tells us that the PASCAL Context dataset "contains carefully 03:21 localized pixel-wise semantic annotations for the entire image on the PASCAL VOC 2010 detection training set. This results in 459 semantic categories across 10,000 (sic) images"; so the training dataset that's used to develop the version 03:21

of COB neural network in row 2 is trained on input images, where, as I understand it, every pixel in the image has been segmented and there are a very large number of classes.

In contrast, looking at page 7 for -- where 03:22
it describes the PASCAL VOC 12, in the middle of the first paragraph it says "The goal is to detect the boundaries of the object that belong to the 20 classes of PASCAL"; so from that I understand that in the dataset used for the object boundary results 03:22
training for row 3, there are a far smaller number of classes and it's likely that on a given image only a few foreground things would have been segmented.

And so while it's important to know for certain why -- why a neural network of the complexity 03:23
of that described in Maninis does anything, the difference in the nature of the training data I think would be the most reasonable explanation for why the same neural network architecture would produce these different -- these different outputs from the same 03:23
input images.

Q Okay. So if I understand correctly then, the object boundary results in Figure 10 used a network that was trained on a learning set that had 20 classes. 03:23

I think that's what you said, right?

A So it was trained on data that was extracted from a training set that had 20 classes. Before that training data went into COB, all of those 20 classes were flattened down to just the boundaries around 03:24 whatever the things were that happened to be in those 20 classes.

But because there were only 20 classes of things that they were -- that were segmented in the PASCAL VOC 12 segmentation database, I would 03:24 suspect -- and I don't have the images in front of me to confirm this, but I would suspect that on any given image there would be far fewer segments and, thus, far fewer boundaries.

And so the network would learn that it's 03:24 only the -- would learn to only segment the things that it was seeing in its training dataset which would be a small number of foreground images rather than a much larger number of boundaries as it would have seen in the training data for the generic image 03:25 segmentation in row 2.

Q Got it.

So the object boundary results are based on the system essentially looking for objects that fall into one of 20 classes and only depicting those and 03:25

that's why the background things like trees are excluded there that were picked up by the generic image segmentation results; is that right?

MR. BLYTHE: Objection.

THE WITNESS: So I just want to be -- 03:25

MR. BLYTHE: I just wanted to make sure that got on the record.

Objection to form.

Just give me a beat.

THE WITNESS: Sorry, Mr. Blythe. 03:25

I just want to be really clear that it's not that it's looking for objects that fall into one of 20 classes and that it knows whether something is in that class or not, it's that it's been trained on a dataset where the annotations on that dataset are 03:26 boundaries that are only applied to things that fall into one of 20 classes. And, therefore, there would be likely fewer boundaries in the training data or the object boundary detection version of trained -- version of COB than for the generic image 03:26 segmentation version of COB.

BY MR. ARGENTI:

Q Taking a step back from Figure 10 specifically and talking more generally about this Figure 5 of Maninis, it's your view that the 03:26

low-level applications in Section 5 of Maninis are performed by what you refer to as the "Maninis COB neural network," correct?

A I'm sorry, you said you wanted to look at Figure 5? 03:27

Q No. I think I did and I misspoke, I'm sorry. Let me ask my question again.

Is it your view that the low-level applications in Section 5 of Maninis are performed by what you refer to as the "Maninis COB neural network"? 03:27

A My understanding is that the things that are detailed in Section 5 of Maninis are the experiments that are performed on the work that's developed that is novel to Maninis, that's developed in Maninis, which is what I've been referring to as the "COB neural network," and not in conjunction with other networks. 03:28

Q And so when you say in your declaration that the combination of Maninis and the other prior art references would be "inoperable" in that section starting at paragraph 168, it's because those specific neural networks used for the experiments in Section 5 of the paper would not be able to perform on the classification; is that right? 03:29 03:29

MR. BLYTHE: Objection to form.

THE WITNESS: So the aspect of inoperability of Dr. Foroosh's combination that I'm addressing in 168 is based on the inability of the Maninis COB to produce semantic contours. 03:29

BY MR. ARGENTI:

Q Okay. Let's turn now to Section 6 of Maninis.

This section is entitled "Experiments on High-Level Applications," correct? 03:30

A Yes, that's what I see it titled.

Q And this section starts on page 9 and goes through the top of page 13, right?

A Yes.

Q At the bottom of page 9, in that first 03:30 paragraph under the Section 6 heading, Maninis says they combined "COB with Dilated Network and PSPNet."

Do you see that?

A I see that it says, yes, "combining COB with Dilated Network and PSPNet." 03:31

Q We touched on this a little bit earlier but what is "Dilated Network"?

A My understanding is that "Dilated Network" is a -- is something that performs semantic segmentation. 03:31

Q Is "Dilated Network" a convolutional neural network?

A I'm not sure.

Q What is "PSPNet"?

A My understanding is that "PSPNet" is an alternate architecture for performing semantic segmentation. 03:32

Q Is PSPNet a convolutional neural network?

A I don't have the information in front of me to make that determination. 03:32

Q Do you know whether PSPNet is a neural network?

A I would be very surprised if it wasn't but I -- I don't have that information in front of me.

Q So then do I gather that you yourself had not heard of a PSPNet as of June 2017? 03:33

A Give me a moment.

I think one of these things may be -- I think some of the answers to the questions you've asked here might be referenced in my declaration. 03:33

Q If it helps, you might want to take a look at page 81 of your declaration.

A Thank you.

Okay. No. As I review this -- my declaration, it reminds me that I did look at the 03:35

1 references for Dilated Network and PSPNet and
2 determined that they were neural networks.
3 Q Are they convolutional neural networks?
4 A I don't recall what I determined on that and
5 I don't see a statement in my declaration as to 03:35
6 whether or not they're convolutional neural networks.
7 If that's important at the moment, if you have those
8 references we could look at that.
9 Q No, that's fine.
10 Looking again at Maninis, page 9, under that 03:35
11 heading Section 6 where it says "In Section 6.2,
12 we study the interplay of our boundary detector with
13 semantic contours and semantic segmentation by
14 combining COB with Dilated Network and PSPNet."
15 Do you agree that Maninis describes 03:36
16 combining COB with Dilated Network and PSPNet?
17 A I agree that Maninis uses the word
18 "combining" to describe what they did with COB and
19 PSPNet.
20 Q And in that same sentence at the bottom of 03:36
21 page 9 Maninis goes on to say "In Section 6.3 we
22 couple the COB proposals with the Fast R-CNN pipeline
23 for object detection."
24 Do you see that?
25 A I see that sentence, yes. 03:36

Q What is "Fast R-CNN"?

A "Fast R-CNN" is an object detection pipeline.

Q The Fast R-CNN pipeline is not something that Maninis came up with on its own in this paper, 03:37 right?

A Fast R-CNN is a separately published work and to my knowledge there is -- it's -- it was created by different investigators.

Q And the Fast R-CNN pipeline was known in the 03:37 field before the Maninis paper was published, right?

MR. BLYTHE: Objection to form.

THE WITNESS: Fast R-CNN was -- is a pipeline that was known in the computer vision field prior to 2017. 03:38

BY MR. ARGENTI:

Q And likewise, Dilated Network and PSPNet were also known in the computer vision field before the publication of Maninis, right?

MR. BLYTHE: Objection to form. 03:38

THE WITNESS: So I think it's fair to say that they were known to Maninis and his coauthors at the time that they wrote this manuscript and did this work.

BY MR. ARGENTI: 03:39

Q And they cite at least one published work that describes that, correct?

MR. BLYTHE: Objection to form.

THE WITNESS: They make citations for each of those; whether or not those are citations that have 03:39 been published, I don't know.

BY MR. ARGENTI:

Q When we look at that sentence again when it says "In Section 6.3 we couple the COB proposals with the Fast R-CNN pipeline for object detection," do you 03:40 agree that in Section 6.3 Maninis describes coupling the COB proposals with the Fast R-CNN pipeline for object detection?

A So my understanding of the work described in Section 6.3 is that a process version of the output 03:40 of COB is used as an input to the Fast R-CNN-type line. And so to the extent that that might be described as "coupling," then they are coupled.

Q Section 6 of Maninis describes high-level applications including object classification, 03:41 correct?

MR. BLYTHE: Objection to form.

THE WITNESS: Is there somewhere that you see the term "object classification"?

BY MR. ARGENTI: 03:42

Q Earlier I thought you were distinguishing Section 5 of Maninis as not involving object classification; so now I'm trying to get to Section 6.

Is it your understanding that the 03:42
experiments described in Section 6 of Maninis resulted in object classifications?

MR. BLYTHE: Objection to form.

THE WITNESS: I don't think that's the terminology that I'd use. 03:42

BY MR. ARGENTI:

Q Do the experiments in Section 6 involve semantic segmentation?

A Some of them do.

Q Which would you point to for that? 03:42

A So, for instance, the results presented in Figure 16 involving the Dilated Network -- or Dilated Convolutional Network are semantic segmentations.

Q So if we look at Figure 16, for example, in the left column, they were able to distinguish 03:43
between the objects in the image that are people from the objects that are a table or a bottle, right?

A So in Figure 16 we see in row 2 that the dilated convolution network was able to do that semantic segmentation and maybe -- distinguish 03:44

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between those classes that you had mentioned.

Q And the tables at the top of page 11 provide -- provide further results of the experiments that Maninis describes in Section 6, right?

A Yes, the tables at the top of page 12 all appear to be referenced from the "Results" of Section 6. 03:45

Q Do each of those tables involve distinguishing the semantics?

MR. BLYTHE: Objection to form. 03:45

THE WITNESS: My understanding is that the results presented in Tables 4 through 7 involve distinguishing semantics.

BY MR. ARGENTI:

Q And in those tables and the corresponding discussion of Maninis, Maninis says that the approaches using COB for semantic segmentation perform better than the ones that didn't involve COB, right? 03:46

A Is there a particular statement or sentence that you'd like to direct me to for that? 03:46

Q Well, we can still look at the results in those tables where the approaches that used COB are bolded, right?

A Yes, I'm looking at the table. 03:46

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Q What's your understanding of the relevance of that bolding?

A My understanding of -- I --

It appears that the largest magnitude number in each column is bold. 03:47

Q Does a larger magnitude number mean more accurate results?

A It means a higher score on the metric that they were using.

I think it's important to recognize that 03:47 accuracy for a complex task like this could be measured in different ways. And I think that as we see in Figure 16, primarily what they're achieving with the combination of COB and these other networks is greater precision around the edges of the 03:47 segmentations, or greater precision of the boundaries and closer correspondence of those boundaries with the ground/tree boundaries.

Q So I think you just might have answered my next question but just to confirm, some of the 03:48 entries on those tables on page 12 of Maninis are identified as involving COB, correct?

A Some of the rows involve a combination of an existing network or pipeline with COB.

MR. ARGENTI: I think it's time to take another 03:48

break. It can be a quick break, and then I think I'm close to wrapping it up.

Sound good?

Five minutes.

MR. BLYTHE: Should be good. 03:49

Is that okay with you, John, or do you need a little more this time?

THE WITNESS: Why don't we make it six and come back at 55, all right? That will give me time to get down the hall. 03:49

(Off the record.)

MR. ARGENTI: Back on the record.

Q Dr. Mongan, earlier today we took two breaks so that you could discuss with Mr. Blythe a possible issue of privilege or work product. 03:55

Aside from those two instances, have you discussed your testimony with Mr. Blythe or Dental Monitoring's counsel at any point during this deposition?

A No, I have not. 03:55

MR. ARGENTI: That's all my questions, then, subject to any follow-up after redirect.

Thank you, Dr. Mongan.

THE WITNESS: Thank you Mr. Argenti.

MR. BLYTHE: So can we go off the record just 03:56

briefly? I'm going to look at my notes, I may have some redirect, we'll get to that in a second.

Can we go off, maybe come back --

I know we want to try to get wrapped up here. 03:56

-- maybe 4:05?

MR. ARGENTI: No, works for me.

MR. BLYTHE: Okay. Thank you.

(Off the record.)

04:04

EXAMINATION

BY MR. BLYTHE:

Q Dr. Mongan, can you please turn back to Exhibit 1007 and the Maninis reference?

A Okay. I have that in front of me. 04:14

Q Do you recall Mr. Argenti asking you questions about the language at page 1 of the Maninis reference regarding "base CNN networks"?

A Yes, I do recall some questions regarding that. 04:14

Q Does which base CNN network that is included in the COB neural network or COB generic CNN architecture impact your opinions regarding the operability of the combination proposed by Dr. Foroosh? 04:15

MR. ARGENTI: Objection. Form.

THE WITNESS: No. My opinions regarding the operability of -- the inoperability of the combination proposed by Dr. Foroosh would be independent of which base CNN was used inside of the 04:15 COB architecture because changing the base CNN doesn't change the form of the input or form of the output of the COB neural network. And it -- it's the form of the output that makes it inoperable.

BY MR. BLYTHE: 04:15

Q And how does the base CNN factor into the COB neural network architecture?

MR. ARGENTI: Objection. Form.

THE WITNESS: The principal difference that one would expect to see with different base CNNs 04:16 substituted into the COB neural network would be small differences in performance as seen in Table 2.

BY MR. BLYTHE:

Q And I recall that you also were directed to Figure 2 -- or sorry, you may have spoken to Figure 2 04:16 in discussing the base CNN network.

Do you recall that?

A Yes, I believe I did.

Q Do you have an understanding of how the base CNN is functioning in that diagram of the 04:16

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COB architecture?

A Yes, I believe I do.

Q And how does it function?

A So it functions as a multi-level feature detector. 04:17

Q What is a "multi-level feature detector"?

A So it uses the feature detection portion of a base CNN that was originally trained for object classification to identify contours at different scales. 04:17

Q Is the feature detection portion an output of that base CNN?

A When the base CNN is used in its originally conceived or architected fashion, it is not an output -- there -- those feature detections are not 04:18 outputs of the base CNN when it's used for the image classification task for which it was originally defined -- designed.

And, in fact, my understanding is that the final layers of the base CNN that would perform the 04:18 image classification are removed when it's put into here -- when it's put into the Maninis COB neural network. And the feature maps are extracted from intermediate layers of the base CNN.

MR. BLYTHE: Okay. No further questions; thank 04:19

you.

MR. ARGENTI: Let's take a very quick break; shouldn't be more than two minutes.

(Off the record.)

MR. ARGENTI: Back on. 04:21

THE WITNESS: Yes.

MR. ARGENTI: No further questions from me, Dr. Mongan.

MR. BLYTHE: Thank you.

THE WITNESS: Thank you, Mr. Argenti. 04:21

MR. BLYTHE: Thank you, Dr. Mongan.

MR. ARGENTI: All right. Off the record again.

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REPORTER'S DEPOSITION TIME LOG:

REPORTER - LAURIE HELD-BIEHL

DATE - Tuesday, July 23, 2024

WITNESS - JOHN T. MONGAN, M.D., Ph.D.

ATTORNEY	ON RECORD	OFF RECORD	TOTAL
ARGENTI	10:11 A.M.	10:26 A.M.	0:15
	10:29 A.M.	10:55 A.M.	0:26
	10:57 A.M.	11:20 A.M.	0:23
	11:31 A.M.	11:54 A.M.	0:23
	11:56 A.M.	12:49 P.M.	0:55
	1:31 P.M.	2:50 P.M.	1:19
	2:56 P.M.	3:49 P.M.	0:53
	3:55 P.M.	3:56 P.M.	0:01
		TOTAL USED:	4:35
BLYTHE	4:14 P.M.	4:19 P.M.	0:05
		TOTAL USED:	0:05

I, the undersigned, a Certified Shorthand Reporter of the State of California, the State of Illinois and the State of Texas, a Certified Court Reporter for the State of New Jersey and the State of Washington, and Registered Professional Reporter, Certified Realtime Reporter, Registered Merit Reporter, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that the appearances of counsel are set forth herein; that the witness in the foregoing proceedings, prior to testifying, was placed under oath; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction and that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney or of any of the parties.

I further certify that Pursuant to

Rule 30(f)(1) of the Federal Rules of Civil Procedure, prior to the completion of the deposition the deponent DID request to read and sign said deposition transcript and that further certification requirements pursuant to Rule 30(f)(1) will be certified after they have occurred.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: July 30 2024

LAURIE HELD-BIEHL, CSR, CCR, RPR, CRR, RMR
CA CSR No. 6781
IL CSR No. 084002860
NJ CRR No. 30XI00239100
TX CSR No. 8555
WA CCR No. 21020748
RPR/CRR/RMR No. 32836

ANDREW BLYTHE
ablythe@gibsondunn.com

July 30, 2024

RE: ALIGN TECHNOLOGY, INC. v. DENTAL MONITORING SAS
7/23/2024, JOHN T. MONGAN, M.D., Ph.D. (#6801299)

The above-referenced transcript is available for review.

Within the applicable timeframe, the witness should read the testimony to verify its accuracy. If there are any changes, the witness should note those with the reason, on the attached Errata Sheet.

The witness should sign the Acknowledgment of Deponent and Errata and return to the deposing attorney. Copies should be sent to all counsel, and to Veritext at Calendar-PNW@Veritext.com

Return completed errata within 30 days from receipt of testimony.

If the witness fails to do so within the time allotted, the transcript may be used as if signed.

Yours,
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ALIGN TECHNOLOGY, INC. v. DENTAL MONITORING SAS

JOHN T. MONGAN, M.D., Ph.D. (#6801299)

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JOHN T. MONGAN, M.D., Ph.D. Date

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ALIGN TECHNOLOGY, INC. v. DENTAL MONITORING SAS
JOHN T. MONGAN, M.D., Ph.D.(#6801299)

ACKNOWLEDGEMENT OF DEPONENT

I, JOHN T. MONGAN, M.D., Ph.D., do hereby declare that I have read the foregoing transcript, I have made any corrections, additions, or changes I deemed necessary as noted above to be appended hereto, and that the same is a true, correct and complete transcript of the testimony given by me.

_____ _____

JOHN T. MONGAN, M.D., Ph.D. Date

*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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