[redacted]

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

JUMIO CORPORATION,
Petitioner,
v.
FACETEC, INC.,
Patent Owner.

Patent Nos.: 10,776,471
11,157,606
11,693,938
11,874,910

Inter Partes Review Nos.: IPR2025-00106
IPR2025-00107
IPR2025-00108
IPR2025-00109

** [redacted] **

DEPOSITION OF JOSHUA ROSE, Volume 1
San Diego, California
Thursday, January 15, 2026

Reported by:
LESLIE JOHNSON, RPR, CCRR, CSR No. 11451
Job No.: 7811282

PAGES 1 - 164

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Jumio EX1082 Page 1
Jumio v. FaceTec IPR2025-00106

[redacted]

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** [redacted] **

DEPOSITION OF JOSHUA ROSE, Volume 1, taken on behalf of Petitioner, at 900 Bayfront Court, San Diego, California, beginning at 9:09 a.m. and ending at 7:13 p.m., on Thursday, January 15, 2026, before LESLIE JOHNSON, Certified Shorthand Reporter No. 11451.

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Jumio v. FaceTec IPR2025-00106

APPEARANCES:

For Petitioner:

MORRISON FOERSTER, LLP
BY: MEHRAN ARJOMAND, ESQ.
707 Wilshire Boulevard
Los Angeles, California 90017-3543
(213)892-5295
marjomand@mofo.com
- and -
MORRISON FOERSTER, LLP
BY: MARLEY MAY MACAREWICH, ESQ. (Via Zoom)
425 Market Street
San Francisco, California 94105-2482
(415)268-6387
mmacarewich@mofo.com

For Patent Owner:

FINNEGAN HENDERSON FARABOW GARRETT & DUNNER, LLP
BY: JASON E. STACH, ESQ.
KASSANDRA M. OFFICER. ESQ.
901 New York Avenue, NW
Washington, D.C. 20001-4413
(202)408-4155
jason.stach@finnegan.com
kassandra.officer@finnegan.com

APPEARANCES (Cont.):

Also Present:

AMANDA BRADLEY (Via Zoom)

GINA SIGNORELLO (Via Zoom)

I N D E X

WITNESS	EXAMINATION
JOSHUA ROSE	
Volume 1	
BY MR. ARJOMAND	6, 142
BY MR. STACH	132

PREVIOUSLY MARKED EXHIBITS

JOSHUA ROSE

NUMBER	DESCRIPTION	PAGE
Exhibit 2037		107
Exhibit 2040		125
Exhibit 2059		163
Exhibit 2067		80
Exhibit 2068		160
Exhibit 2069		22

San Diego, California; Thursday, January 15, 2026
9:09 a.m.

JOSHUA ROSE,
having been first duly sworn, was examined
and testified as follows:

EXAMINATION

BY MR. ARJOMAND:

Q Good morning.

A Good morning.

Q Please state and spell your name for the record.

A Joshua J. Rose, J-O-S-H-U-A, J, just the letter, Rose, R-O-S-E.

Q Thank you, Mr. Rose.

Do you understand that you've taken an oath to tell the truth today?

A Yes.

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

A No.

Q Mr. Rose, how many times have you been deposed?

A Once.

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Q Okay. And was that deposition in an inter partes review or IPR proceeding?

A I don't believe so.

Q Okay. Let me then just kind of go through the ground rules with you for this deposition today because this deposition is for IPR proceedings.

I'll ask a question. Counsel here may object, but then you have to answer my question unless there is an objection based on privilege or confidentiality.

Does that make sense?

A Yes.

Q Please give verbal responses to my questions because the court reporter here cannot pick up non-verbal responses. So no head nodding or gestures.

Does that make sense?

A Yes.

Q We can take a break whenever you need, but if there is a question pending, you have to answer the question before we take a break.

Does that make sense?

A Yes.

Q During the breaks, you may not speak to counsel regarding the subject matter of your testimony.

Does that make sense?

A Yes.

Q Great.

So Mr. Rose, what did you do to prepare for your deposition today?

A I reviewed my declaration and went through ideas that relate to what I have written in my declaration.

Q Did you review anything else beyond your declaration?

A Also the exhibits that are cited in the declaration.

Q Okay. As you sit here today, do you recall what exhibits you reviewed?

MR. STACH: Objection. I just caution you not to reveal communications that you had with counsel. But you can otherwise answer if you recall.

THE WITNESS: I don't have the exact exhibit numbers that I reviewed, but I reviewed a good amount of them.

BY MR. ARJOMAND:

Q Okay. Do you recall the documents that you reviewed, not by exhibit number, but by name or subject matter?

MR. STACH: Same caution.

THE WITNESS: I reviewed some exhibits, and

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[redacted]

I'd be happy to talk about the exhibits that are cited in my declaration.

BY MR. ARJOMAND:

Q Okay. But as you sit here today, you can't recall by subject matter or by title the documents that you reviewed?

MR. STACH: Same objection.

THE WITNESS: I think I've got some exhibit references in my declaration. I think I reviewed the iBeta-related exhibits, the exhibits relating to [redacted], the FaceTec explainer video, pricing quote website printout. I recall reviewing those, but I may have reviewed other ones as well.

BY MR. ARJOMAND:

Q Okay. And as you sit here today, you can't recall what other documents you reviewed beyond the ones you just listed?

A I took a look at the patents that are, I think, referenced in the case. I didn't do a deep review. I kind of just skimmed them to refresh myself on kind of what they're about.

MR. STACH: Counsel, one of his answers already revealed something that's been redacted from

the public version of the declaration.

MR. ARJOMAND: Uh-huh.

MR. STACH: You had mentioned perhaps discussing the procedures for confidentiality that you were proposing.

MR. ARJOMAND: Uh-huh.

MR. STACH: Can you do that, please?

MR. ARJOMAND: Sure. I'm happy to do so.

Actually, Mr. Rose, you have -- it seems like you have a copy of your declaration in front of you. Is that a -- Counsel is that a clean copy, without any marks or anything like that?

MR. STACH: That's my understanding, yes.

MR. ARJOMAND: Okay. So let me actually just give you a clean copy here. I'll place in front of the witness Exhibit 2059, which is Mr. Rose's confidential declaration.

BY MR. ARJOMAND:

Q So Mr. Rose, let me just direct you to what I believe have been marked as the confidential portions of your declaration. I'm just going to refer to the paragraph numbers. I'm not going to refer to the content of those portions, to give you a sense of what's been marked by counsel as confidential information.

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[redacted]

And I'll be very careful when asking questions directed to those paragraphs of your declaration to let the court reporter know and everybody on the line know that we're about to enter into a portion of the deposition that should be marked "Confidential, Attorneys Eyes Only."

However, there might be questions that I ask, like the questions that I asked regarding what documents that you reviewed, where it may be that in your answer you inadvertently disclose confidential information. So what I'm hoping to do to avoid that situation is to identify the paragraphs for you so you know in your mind what is confidentially marked in this -- in your declaration.

And then to the extent you yourself or counsel believe that you're about to testify as to confidential information, if you could let me know, we'll take the necessary actions to ensure that no confidential information is disclosed publicly.

Does that make sense?

A Yes.

MR. ARJOMAND: Does that make sense, Mr. Stach?

MR. STACH: So when we were talking about this before the deposition, I said that we'd certainly

be willing to give it a try. And I am happy to continue to give it a try, but as we already saw, it's -- the possibility is very real that he may inadvertently reveal something.

And of course, we have Jumio representatives on the line who are not under the protective order. So I guess what I would say is, I'm willing to continue this for now, but there is a procedure in the Trial Practice Guide that says that at any point counsel can designate the entire transcript "Confidential" preliminarily, and there's 10 business days after receiving the transcript, and then de-designate.

And that, I think, is the process set forth by the PTAB. So we're willing to go along for now with the special procedure that you're proposing, but if we see any other instances where information has been inadvertently disclosed, then I think we're probably going to ask the Jumio representatives to drop off the line so we can just proceed on the confidential record at that point.

MR. ARJOMAND: Well, I appreciate your points, Mr. Stach. I think, as we proceed, my hope is that we won't have a situation where Mr. Rose will be inadvertently disclosing confidential information.

As I told you before the deposition, I'll be

[redacted]

1 focusing on his declaration, obviously, and specific
2 paragraphs. And I think, as we go through that
3 information or those types of questions, I think it
4 will be pretty clear where we're discussing
5 confidential information and where we're not discussing
6 confidential information.
7 In addition, if I can just go through the
8 paragraphs that have been marked "Confidential" by
9 FaceTec, that may help Mr. Rose not to inadvertently
10 disclose confidential information.
11 MR. STACH: I mean, you can certainly direct
12 him to those. I don't expect him to maintain in his
13 head during the deposition which ones you name off at
14 this point. So I disagree with the premise that that
15 will somehow cure this, but I do like that you're
16 thinking of ways to avoid inadvertent disclosure.
17 And like I said, we can continue on this
18 path, but if I see another problem -- we've already had
19 one -- if I see another issue, then I will not be okay
20 continuing on this path.
21 MR. ARJOMAND: Okay. Let's just take it one
22 step at a time and see how it goes.
23 MR. STACH: I'm fine with that.
24 BY MR. ARJOMAND:
25 Q So Mr. Rose, if I could direct you to your

[redacted]

declaration. I'm just going to highlight for you the paragraphs that have been marked "Confidential" so that you have in your mind what subject matter pertains to FaceTec confidential information.

So turning to page 4, paragraph 16.

A I see it.

Q Okay. Turning to page 5, paragraph 22.

A I see that.

Q Turning to page 11, paragraphs 34, 35, 36, 37, 38, 39, 40, and 41. I believe also 42, 43, and 44.

A I see those.

Q Okay. And with respect to paragraph 46 on pages 19 and 20, on page 20, basically the first three lines on that page.

A Okay.

Q And then there are portions of paragraphs 48, 50, and 52 and 55 that have --

A Sorry, which ones?

Q 48.

A Okay.

Q These relate to FaceTec's commercial business. So I think that -- for example, if you take a look at paragraph 52, you get a sense of what that testimony is directed to. So any answer that might touch upon FaceTec's commercial results would be

[redacted]

confidential.

A Okay.

Q Okay. And that's it.

MR. ARJOMAND: Counsel, did I miss anything?

MR. STACH: Yes. Paragraph 74 and several others towards the end.

MR. ARJOMAND: Oh, on the -- on just the summary of the -- of the exhibits?

MR. STACH: That's -- I believe that's an accurate characterization, but yeah, there's -- there are quite a few redactions towards the end of the declaration.

MR. ARJOMAND: Okay. Do you want to identify them so the record is clear?

MR. STACH: I don't need to identify them. I just need to make sure that there's no inadvertent disclosure here. That's all.

MR. ARJOMAND: Okay. All right.

BY MR. ARJOMAND:

Q So I think we can get back to asking you, Mr. Rose, questions.

So before we discussed the issue of confidentiality, you indicated that you had reviewed your declaration, iBeta-related exhibits, certain other documents that I won't mention right now, the face

explainer video, some websites, and you skimmed the patents.

Does that accurately summarize what you reviewed in preparation for your deposition today?

MR. STACH: Objection. Form.

THE WITNESS: Sitting here today, that's what I recall. There may have been more.

BY MR. ARJOMAND:

Q Okay. Great.

When I initially asked you what did you do to prepare for your deposition today, you said "I reviewed my declaration and went through ideas that relate to what I've written in my declaration."

Can you explain to me what you meant by "I went through ideas that relate to what I've written in my declaration"?

MR. STACH: Objection. I would caution you not to reveal any communications you had with counsel. To the extent you can answer without revealing those communications, you're free to do so.

THE WITNESS: There are a variety of topics in my declaration that -- there are more details and a history of things in my memory related to those topics. So kind of just reviewing that.

/ / / /

BY MR. ARJOMAND:

Q What do you mean by "there are more details and a history of things in my memory related to those topics," presumably in your declaration?

MR. STACH: Same caution about attorney-client communications.

THE WITNESS: So, for instance, on paragraph 3, when I talk about my previous education, kind of just refreshing my recollection about my education. You know, I went to college for -- graduated in 2007 from University of California, San Diego. And there's a lot more to -- to that that that gets me thinking about.

BY MR. ARJOMAND:

Q Anything else with respect to the history of things in your memory related to the topics presumably in your declaration?

MR. STACH: Same caution about not revealing attorney-client communications.

THE WITNESS: I think that there's a variety of details and history related to a lot of the things that I have written in my declaration.

BY MR. ARJOMAND:

Q Okay. Let me ask you, who did you meet with in preparation for your deposition today?

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[redacted]

A I had conversations with counsel in preparation for my deposition today.

Q And with which counsel did you meet with, Mr. Rose?

A They're sitting right here.

Q Did you meet with anybody else?

A FaceTec counsel was on some of the meetings that we had.

Q Okay. How many meetings did you have, Mr. Rose?

A I would say it was about three or four.

Q And in total, roughly how many hours did you meet with counsel in preparation for your deposition today?

A I think it was around 10 to 15 hours.

Q In reviewing your declaration, Exhibit 2059, in preparation for today's deposition, did you notice any errors?

A I haven't noticed any errors in the declaration. Yeah, I haven't noticed any.

Q There is nothing in your declaration, Exhibit 2059, that you'd like to correct?

A No. I think it's -- it's good.

Q Okay. Mr. Rose, are you familiar with FaceTec's Spoof Bounty program?

A Yes. I'm familiar with it.

Q Can you explain to me -- strike that.

Can you explain the Spoof Bounty program to me?

A Well, I think I have it explained here in my declaration, starting paragraphs 29 -- 29 and 30.

What would you like to know?

Q What FaceTec software product are participants in the Spoof Bounty program trying to spoof?

MR. STACH: Objection. Form.

THE WITNESS: Sorry. Can you repeat the question?

BY MR. ARJOMAND:

Q Sure.

What FaceTec software product or products are participants in the Spoof Bounty program trying to spoof?

MR. STACH: Objection. Form.

THE WITNESS: So FaceTec's -- FaceTec's product is a library that we sell to partners and customers that is a combination of a front-end device SDK -- we call it the FaceTec device SDK -- and a back-end server side component we call FaceTec server or the FaceTec server SDK.

[redacted]

Integrated into this library is a piece of functionality called 3D Liveness Detection, which is our core foundational part of the product that opens up an interface for users to perform what we call a face scan.

And during that face scan, the users align their face at a far distance in an oval that we render to the screen to help the users align their face. And then, once that capture has been made and enough frames have been processed and analyzed, the oval expands to guide the user to perform a capture of their face at a closer distance. During that time, we are capturing, processing, and analyzing image data and other data.

Once that process is complete, that data is assembled and encrypted and sent up to the -- in a production implementation, this is our customers doing this. In the Bounty program, this is us doing this. But it's sent to the back end, where that payload is decrypted, unpacked, deserialized, and then a significant amount of analysis and security decisions and other processing is performed.

So that system is hosted by FaceTec. So we essentially host our own product that our partners and customers get. And that is what is made available in the Spoof Bounty program.

The Spoof Bounty program also requires users to submit an email and agree to terms and conditions prior to using -- prior to using the software that we're hosting.

And that's the software that exists in the Spoof Bounty program for users to make spoof attempts and other types of attacks against.

BY MR. ARJOMAND:

Q So at the start of your answer, you indicated that FaceTec's product is a library.

What do you mean by "a library"?

A The distinction that we make on the development and engineering team and the distinction in my mind is an app or application is a full -- essentially, on IOS or Android, it's the actual app. It's the icon. It's the full payload that gets installed on a user's device.

If it's a website, it's the website that's loaded. And a library is a piece of functionality inside of that application that performs functionality.

Q Let's do this. Let me show you a video that's been marked as an exhibit in this proceeding. It may help us have a concrete example to discuss some of these topics.

MR. ARJOMAND: So what I suggest that we do

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is we go off the record and have Mr. Rose watch Exhibit 2069. And then after he watches Exhibit 2069 off the record, I can ask him questions. At that point, the video will be available to him, so should he want to go back and look at portions of the video to answer any questions, he may.

MR. STACH: Could we stay on the record, but just not transcribe the audio of the -- as the video is playing, so that, if there is any discussion that happens during the video, at least that's captured?

MR. ARJOMAND: That's fine with me. I just would like to let you know, Mr. Stach, that I think the court reporter does need to set up that loaner laptop to get the video going.

MR. STACH: Okay.

(Recess taken from 9:46 to 9:51 a.m.)

BY MR. ARJOMAND:

Q Mr. Rose, do you want to play the video, which is Exhibit 2069?

(Video playing.)

BY MR. ARJOMAND:

Q Mr. Rose, did you review Exhibit 2069 in preparation for your deposition today?

A I watched that video once, I believe.

Q Okay. Do you recall making that video,

Exhibit 2069?

A I recall doing it, yeah.

Q Do you recall when you made that video, Mr. Rose?

A I don't recall.

Q Was it before 2020?

A Before 2020?

Q Yes.

A I'm not sure. I don't recall.

Q Was it this year?

A It was not this year.

Q Was it last year?

A I don't believe it was last year.

Q Do you think it was before the pandemic?

MR. STACH: Objection. Form.

THE WITNESS: I really don't recall.

BY MR. ARJOMAND:

Q Okay. Do you think Exhibit 2069 is accurate?

MR. STACH: Objection. Form.

THE WITNESS: Can you clarify what you mean by "accurate."

BY MR. ARJOMAND:

Q As you watched the video, did there -- strike that.

As you watched the video, was there anything

[redacted]

in the video that you thought was an inaccurate representation of FaceTec's software?

MR. STACH: Objection. Form.

THE WITNESS: This video was created as a marketing video. And I'd really have to probably study the video to identify any kind of inaccuracies. I did provide a walk-through of some aspects of the product, but definitely did not go deeply into the technology.

So I guess from the perspective of inaccuracy, one might think accuracy means explaining the totality of everything that's occurring on the surface level and internally.

Did that sufficiently answer your question?

BY MR. ARJOMAND:

Q As you sit here today, while you were watching the video, did anything jump out at you as being inaccurate based on what you watched?

MR. STACH: Objection. Form.

THE WITNESS: I'm not sure what you mean by jump out at me, but this is a marketing video that we created years ago.

BY MR. ARJOMAND:

Q Mr. Rose, when did FaceTec launch its product?

MR. STACH: Objection. Form.

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[redacted]

BY MR. ARJOMAND:

Q Let me rephrase that.

When did FaceTec launch its ZoOm product?

MR. STACH: Objection. Form.

THE WITNESS: I think I've got something in my declaration about this. I'm just trying to find it.

I'm not sure why I'm not seeing where in my declaration I directly say that.

Yeah. So we -- FaceTec was started in 2013. Very soon after that, we -- very soon after that, we were looking at and trying to determine ways that we could build what we believed was the missing link in remote identity verification and kind of the missing piece in terms of security in general. And we were working with, looking at and developing computer vision, machine learning, and other types of software.

And through that process, we developed what we initially called ZoOm. So for quite some time in the very early days of the company, we were developing the foundations of what would become ZoOm. And that is the -- the essential component to that is the two-distance capture of faces of users to identify, process, analyze, and extract the signal that occurs in the difference between the far-distance capture and the close-distance capture.

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[redacted]

And so, ever since the early days of focusing primarily on that, we had prototypes. And, as we discovered that we could build a product out of it, we -- and that the solution was viable and that the signal was strong, the signal coming from perspective distortion, other distortions that occur in the differences between the frames from the user at the far distance to the close distance, we essentially trended towards productizing that into -- I think the term you used is "ZoOm." That was what the product was called initially.

So we've had many versions along the way. We're currently on version 10. Started with 1.

And so what was your question? When did we launch?

BY MR. ARJOMAND:

Q Well, maybe it would be helpful to just step back a bit here.

So you indicated in your answer right now that you were developing the foundations of what would become ZoOm, and you then discussed the essential component that is the two-distance capture.

When did you first come up with that idea?

MR. STACH: Objection. Foundation. Form.

THE WITNESS: I didn't come up with that

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idea. Kevin came up with that idea.

BY MR. ARJOMAND:

Q And when was that, Mr. Rose?

A Not entirely sure. It was in the very, very early days because, for the vast majority of the history of our company, we've been focusing on extracting the signal that occurs when doing this two-distance capture. So it was -- it was in the very, very early days of FaceTec.

Q In 2013?

A I'm not entirely sure if it was in 2013. I know that we've been focusing on it since basically the very beginning, and this two-distance capture and the extraction of those signals has been present in all of the versions of ZoOm or the FaceTec SDKs that we've ever put out.

Q So you don't recall if it was in 2013?

MR. STACH: Objection. Form.

THE WITNESS: I'm not sure if -- if by "it" you mean when Kevin had this idea. And whether it was in 2013, I don't recall, but it could have been.

BY MR. ARJOMAND:

Q Do you believe it was before 2013 that Kevin came up with this idea?

MR. STACH: Objection. Form.

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[redacted]

THE WITNESS: I can't really speculate as to whether Kevin knew this in 2013 or before.

BY MR. ARJOMAND:

Q Okay. So you indicated that there were many different versions of ZoOm.

When was the first version completed, to the best of your recollection?

MR. STACH: Objection. Foundation and form.

THE WITNESS: When we first started working on this software that would perform what we now call 3D Liveness Checks and 3D Liveness Detection, we set out to extract this -- what we believe to be detectable signal based on perspective distortion, other types of distortion, other types of differences that may be apparent and detectable when analyzing frames captured from the user at a far distance and a close distance.

From the very beginning to -- from prototypes to our initial versions to versions after that, this has been a core aspect of our technology. I don't have an exact recollection of when the very first version of that came out, was made available. Yeah.

BY MR. ARJOMAND:

Q So, when you said, quote, "When we first started working on this software that would perform what we now call 3D Liveness Checks and the 3D Liveness

Detection," is that what you were referring to as "ZoOm"?

A Sorry. Can you repeat the question?

Q I'm just trying to make sure that we're talking all about the same thing.

So you said that there were currently 10 -- strike that.

We're currently at Version 10 of ZoOm; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: We don't call the product ZoOm anymore. We call it the FaceTec SDKs or we just call it -- we also just call it FaceTec.

BY MR. ARJOMAND:

Q Uh-huh. Okay.

When you first -- strike that.

When FaceTec first launched its product, it was called ZoOm; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: We called -- we called the core product that includes this foundational functionality of 3D Liveness Detection ZoOm for a significant period of time, until we started calling it FaceTec or the FaceTec SDKs.

/ / / /

BY MR. ARJOMAND:

Q Do you recall when you made the name change?

A I couldn't give you an exact year, but we changed it somewhat soon after the pandemic because this other software called Zoom started to be used a lot, and we wanted to disambiguate.

Q When you refer to the product being called "FaceTec SDKs," does that include both the device SDK and the server SDK?

A The way I would say it is the FaceTec device SDKs and the FaceTec server SDK are core elements to what I would more broadly say is the FaceTec SDKs.

We also have a dashboard product that we give away for free that integrates with the server SDK to show information to customers about what's occurring as users use the product and platform.

We have other sample code and examples and documentation that's also available that I think on our team we would kind of also umbrella that under FaceTec SDKs.

Q So would it be fair to say that, under the umbrella of FaceTec SDKs, we have the device-side SDK, the server-side SDK, the dashboard product, and sample code and examples of documentation?

MR. STACH: Objection. Form.

THE WITNESS: I'm not sure if that's a completely full and rigorous definition of what we would always consider the FaceTec SDKs, but those are a lot of the significant components that I would think of when thinking of the FaceTec SDKs.

BY MR. ARJOMAND:

Q As you sit here today, you can't think of any other components; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: As far as things that we ship to customers or the customers -- customers and partners. As far as things we ship to customers and partners and things that they have access to as a part of the integration process, that's what I can think about at the moment.

BY MR. ARJOMAND:

Q Okay. So Mr. Rose, let me direct you back to the video. I'd like you to watch a portion of it again. It's from time stamp roughly 20 seconds to about time stamp 45 seconds. And then I'll ask you some questions about that specific portion of the video.

(Video playing.)

BY MR. ARJOMAND:

Q So what I wanted to focus your attention on

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is, if you go to time stamp -- I think it's maybe at 28. Right there.

Do you see that the -- or time stamp 27. Are you there?

A Uh-huh.

Q Do you see how the video is showing a user interface on an iPhone, and there is a button that's indicated "3D Liveness Check"? Do you see that? I'm at time stamp 27.

A Uh-huh. I don't think this is an iPhone.

Q Okay. Sorry.

Do you see the "3D Liveness Check" product -- strike that.

Do you see the "3D Liveness Check" button on the Smartphone that's shown at time stamp 27?

A I'm seeing that, yes.

Q Okay. So, in the video, you push that button, correct?

A Correct.

Q And then if you move to time stamp 40:42, you indicate that liveness is confirmed. You can play that portion if you want again.

(Video played.)

BY MR. ARJOMAND:

Q So would it be fair to say that, in this

video, Exhibit 2069, you pushed a "3D Liveness Check" button on the Smartphone, you go through a series of steps with the user interface, and then you indicate that liveness is confirmed?

MR. STACH: Objection. Form.

THE WITNESS: I'm not sure what you mean by "fair to say."

BY MR. ARJOMAND:

Q I'm just saying, did I just accurately represent what you've done in this video? Strike that.

So you indicate in the video that you are clicking on the "3D Liveness Check" button, correct?

A Yes.

Q And then, once you do that, the video shows you going through a series of steps utilizing the user interface of the Smartphone; is that correct?

A I mean, there's a lot going on in our technology as I'm doing those steps. From an external observer perspective, what you observe is me pressing the "3D Liveness Check" button, opening our interface, seeing some UI on the screen, some text on the screen, some guidance on the screen.

I'm aligning my face in an oval at what we would call the far distance. I'm pressing the "I'm ready" button. That transitions to another part of our

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[redacted]

interface where the oval is still being shown to assist the user in -- which is me in this case -- in aligning their face in the far oval.

We're presenting feedback, other feedback and guidance text to the screen. Once I perform the far-distance capture, the oval expands. I'm given more guidance. I align my face at the close distance.

There is a significant amount of processing occurring on the device throughout this process. That processing is core to performing the 3D Liveness Check. It involves capturing and processing frames, other types of signals, a significant amount of technology built under the hood there.

And then there's the final part of the process where that -- where a payload that we create is uploaded, sent to the server, where the FaceTec server SDK is running. The FaceTec server SDK decrypts that payload, deserializes it, unpacks it, runs a significant amount of checks on the data, performs analysis to extract the signal that we get from the session.

That signal involves detecting a signal that we know and understand is there when there's a real human face -- real 3D human face there. The server processes that -- all of these signals and eventually

[redacted]

renders a decision as to whether the user who just performed the scan is, to a very high confidence, alive, present, 3D, and generally a real human face.

So that's -- that's what's occurring during that process.

MR. STACH: Counsel, we've been going over an hour and a half. Is now a good time for a break?

MR. ARJOMAND: Sure.

MR. STACH: Okay.

MR. ARJOMAND: Off the record.

(Recess taken from 10:42 to 10:55 a.m.)

BY MR. ARJOMAND:

Q Mr. Rose, before the break, we were talking about Exhibit 2069, specifically the portion of the video around time stamp 20 to around time stamp 45.

So, if you take a look at -- at around time stamp 37, there is an image that's shown that says "Uploading encrypted 3D face scan."

Do you see that?

A Yes.

Q Why are you encrypting the 3D face scan?

A To ensure the security of the system as a whole, it's important that the data that we process and analyze and inspect and pretty much anything that we do with the data hasn't been tampered with.

[redacted]

It's also important because we strive to create a system that is as secure as it possibly can be. And part of that is also ensuring that our customers and partners who integrate us have these layers of security that are built into the product that prevent any problems from happening down the road.

So another reason this encryption is important is also because, once the -- once we create this 3D face scan, which is an encrypted piece of data -- once that piece of data exists, we don't want a potential attacker to be able to decrypt that and be able to inspect or modify or tamper with that piece of data.

This also relates to level 4 of our Spoof Bounty program, which involves attack vectors that include being able to crack the decryption -- crack the encryption and be able to pull off some sort of bypass that would involve that.

It also helps in a case where potentially a -- potentially this piece of data, if it's leaked or our customers' infrastructure is attacked or our customers have some sort of breach, that this data is encrypted at rest so that it can't be utilized for any types of attacks.

All of these things are very important to

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have as the default behavior of the component of our system that secures the data that we're operating on and eventually making decisions on the contents of this encrypted data, so -- which it's that data itself that we -- we process and we make security decisions on, particularly for 3D Liveness Checks, which is essentially the core of our business.

Q Okay. Let me direct you back to Exhibit 2069. And I want to take you to time stamp 30 seconds. Let me know when you're there.

A Okay.

Q Do you see in this image at time stamp 30 seconds, at the bottom right there is some text that says "Camera security verified"?

Do you see that?

A I see that.

Q What does that refer to, Mr. Rose?

A I think my answer might get into a confidential discussion.

Q Sure. We can take a break here and ensure that anyone that's on the line that shouldn't have access to confidential information leaves the line.

MR. STACH: I'd also like to designate the entire transcript "Confidential, Attorneys' Eyes Only" under the protective orders in these cases, please.

MR. ARJOMAND: Well, Mr. Stach, I don't know if that's necessary because, in the case of the previous deposition that we had with Dr. Turk, we were able to clearly demarcate the portions that were confidential versus the portions that were not confidential.

MR. STACH: I understand.

MR. ARJOMAND: Okay.

MR. STACH: I still would like to designate the whole transcript. Thank you.

MR. ARJOMAND: Let's go off the record for one minute.

(Discussion held off the record.)

BY MR. ARJOMAND:

Q Okay. So before the break, Mr. Rose, I directed you to time stamp 30 of Exhibit 2069. At that time stamp, there's an image of the video. At the bottom right, there is text indicating "camera security verified." And I asked you "What does 'camera security verified' refer to?"

A So this is a marketing video that I was a participant in. I didn't edit or create the video.

[redacted]

1 [redacted]

[redacted]

3 So that may be what this is referring to.

4 I'm not sure because I didn't put it there, and it's

5 the first time that I'm seeing it. But that could be

6 what this is referring to.

7 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

MR. STACH: Objection. Form.

THE WITNESS: So the very most foundational element of what our technology does is this two-distance capture where the user is aligning their face at the far distance and then performing a capture at the close distance. And at both distances, we are processing data, analyzing data, collecting data.

And this is in our -- in the device that the user is using in our customers' applications. Generally, if we're talking about a customer or partner integration, we also have demo applications, the Bounty program, where we're using our own software, we're using our own product to do these same things.

And the core primarily thing that we do as a part of 3D Liveness Detection and 3D Liveness Checks, that's essentially the core to our business. It's pretty much the only thing we get paid for. Customers come to us for this 3D Liveness Detection. It is analyzing signals that are apparent when we compare the far-distance images and signals to the close-distance

[redacted]

1 images and signals. That's where the most significant
2 signal for us to make a 3D liveness determination comes
3 from. It's what sets us apart from all other
4 solutions, is the 3D nature of this signal extraction
5 and detection of expected differences comes from.
6 We've done this kind of foundational element
7 of the two-distance capture and the analysis for
8 expected differences in all of the versions of our
9 product.
10 [redacted]
23 So outside of the two-distance capture and
24 the 3D signal extraction and analysis of perspective
25 distortion and other distortions that we make our

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[redacted]

1 decisions off of, [redacted]

4 [redacted]

10 BY MR. ARJOMAND:

11 Q Thank you, Mr. Rose.

12 [redacted]

MR. STACH: Objection. Foundation. Form.

16 BY MR. ARJOMAND:

17 Q Well, let me step back.

18 We've been looking at Exhibit 2069, and at

19 time stamp 20, you recall that there's a "3D Liveness

20 Check" button that you pushed.

21 Do you recall that?

22 A The video is not loading for me right now.

23 I'll try to refresh it.

24 (Video playing.)

25 THE WITNESS: Not doing that at time stamp

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[redacted]

1 20.

2 MR. ARJOMAND: Maybe 21, 22.

3 (Video playing.)

4 MR. ARJOMAND: I believe it's 27. I

5 apologize.

6 THE WITNESS: Okay. 27 and 28, yeah.

7 BY MR. ARJOMAND:

8 Q Do you see that there's a button that says

9 "3D Liveness Check" in the image on time stamp 27 of

10 Exhibit 2069?

11 A Yes.

12 [redacted]

[redacted]

1 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Throughout the rest of the process, our UI
9 showing up, the user performing the scan of their face
10 at the far distance, then the close distance, all of
11 the underlying processing that's happening there, until
12 the 3D face scan is created, happens within the context
13 of our internal code that our customers integrate.
14 That payload is sent up to the customer's
15 server where they're running the FaceTec server SDK.
16 The FaceTec server SDK takes in that data, decrypts it,
17 deserializes it, unpacks it, and a significant amount
18 of processing occurs on the server side.
19 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1

4 BY MR. ARJOMAND:

5

A I don't think that's an accurate summary of my testimony. I talked about a lot of things in my last response.

Q Yeah. Let me take that portion of the question out.

MR. STACH: Objection. Form.

THE WITNESS: Could I hear the question again?

BY MR. ARJOMAND:

Q Sure.

MR. STACH: Objection. Form.

THE WITNESS: I think, as I've referred to in

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[redacted]

my previous response, the two-distance capture, the extraction of signals from that analysis for perspective distortion, other distortions, [redacted] that's a foundational aspect that occurs after our SDK is invoked.

We discussed encryption before. [redacted]

BY MR. ARJOMAND:

Q So Mr. Rose, at Exhibit 26, time stamp 37, there's an image that provides "uploading encrypted 3D face scan."

Do you see that?

MR. STACH: You said Exhibit 26.

MR. ARJOMAND: Oh, I'm sorry.

BY MR. ARJOMAND:

Q Mr. Rose, at Exhibit 2069, at time stamp 37, there's an image that shows a user interface of a Smartphone. The user interface app provides text that indicates "uploading encrypted 3D face scan."

Do you see that?

A Yes.

Q What is a 3D face scan, Mr. Rose?

[redacted]

MR. STACH: Objection. Form.

THE WITNESS: The way that I think about a 3D face scan, it's a term that we've created that I believe we have public documentation. So on our developer site, "3D face scan" would be defined. But the 3D face scan, from the perspective of our technology as a term and the way that I'm using it here, is this encrypted piece of data that includes information, metadata, [redacted], images we have collected from the camera feed as a user performs a scan within our device SDK.

And it's a core part of the payload that our customers and partners, when they integrate our device SDKs and the FaceTec server SDK, they pass this data from their front-end client side code to their back-end server side code and use it as an input to the core functionality in our FaceTec server component that then gets decrypted, unpacked, deserialized, and utilized to extract signals from.

These signals are in the form of 3D detection, analysis for perspective distortion, other distortions, [redacted]

[redacted]

[redacted]

So what a 3D face scan to me is is essentially a core aspect of the payload that's used in the secure 3D liveness determination that we make that's the corest of core things that our product does and what our customers pay us for.

BY MR. ARJOMAND:

Q Okay. So you stated that the encrypted piece of data includes information, metadata, [redacted] images we have collected from the camera feed as the user performs a scan within our device SDK.

Do you recall that testimony?

A Yes.

[redacted]

A The most important signal to us is the image data. So as a part of the user aligning their face in the oval at the far distance and the close distance, the device side is evaluating frames, camera frames in as realtime as possible.

So one of the biggest pieces of data that

[redacted]

1 contains signals that are then processed by the server
2 SDK is the image data that we collect. That's by far
3 the most important set of data that allows us to make
4 high confidence, highly accurate security decisions.
5 [redacted]
24 Q And you also mentioned in an earlier response
25 metadata.

What did you mean by "metadata"?

A Which response was that?

Q You testified that "the encrypted piece of data that includes information, metadata signals that we may have extracted on the device side, images we have collected from the camera feed as a user performs a scan with our" -- "within our device SDK."

Do you recall that testimony?

A Yeah.

Q What did you mean by "metadata" in that testimony?

[redacted]

[redacted]

[redacted]

I do know that the primary aspect about the 3D Liveness Detection is the two-distance capture, the analysis of the signals that are apparent in the image data from the far distance to the close distance, extraction of perspective distortion signals, 3D signals. I do recall that we've looked at it before, but I don't know if there's ever been a release that that was included with.

1 BY MR. ARJOMAND:

2

[redacted]

1 [redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

1 [redacted]

[redacted] But I would say that our technology does go

4 through a process of scanning a user's face, analyzing

5 image data at a far distance and a close distance.

6 [redacted]

23 BY MR. ARJOMAND:

24 Q Okay. So Mr. Rose, what's the difference

25 between a 3D face scan and a 3D face map?

MR. STACH: Objection. Form.

THE WITNESS: Are you asking generally or in the context of something specific?

BY MR. ARJOMAND:

Q Generally for now.

MR. STACH: Objection. Form.

THE WITNESS: So "3D face scan" and "3D face map" are terms that we use internally and externally. So, in my previous testimony, I described what a 3D face scan is from the perspective of how I think about it and how that term is also defined publicly to some extent.

So "3D face scan" and "3D face map" might be used in other contexts by other people to describe other things, but these are also terms that we've defined and we have a meaning for. They're terms that are defined on a website.

So the 3D face scan, to summarize some of the prior testimony of mine, is an object that's encrypted that contains data that we've collected as a part of processing the user interaction with our device SDK.

So the device SDK processes image data. It guides the user to perform a scan of their face at a far distance, increases the oval size, guides the user to perform a scan of the close distance. Quality is

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[redacted]

analyzed. We gather metadata. We place this onto an object that we encrypt that's then processed by FaceTec server -- by the FaceTec server, which for our partners and customers is hosted by them on their servers.

The 3D face scan is the input to a FaceTec server SDK where that data is decrypted, deserialized, unpacked, analyzed. We take the far-distance frames, the close-distance frames, [redacted] the other metadata we've collected, we process those for expected differences, perspective distortion, 3Dness, other differences.

So when that all happens and there's a successful liveness determination, the software will output, in addition to the binary signal that -- of whether there was success or not, will output a 3D face map, which is another encrypted piece of data that -- essentially the use case for that is so that our customers can store that 3D face map. And, in general, what we call the storage of 3D face maps is enrolling or enrollment.

So when the customer stores that, they now have a reference 3D face map of the user who just performed that 3D Liveness Check. [redacted]

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[redacted]

[redacted]

The 3D face map has also -- when we create that object, we -- we remove [redacted] and image data that would have been present on the 3D face scan but don't keep those on the 3D face map. So that leads to a smaller -- the 3D face map is going to be smaller than the 3D face scan.

Those are some of the differences between a 3D face scan and a 3D face map.

BY MR. ARJOMAND:

Q Mr. Rose, you said that the 3D face map -- strike that.

You said that "We remove [redacted] and image data that would have been present on the 3D face scan. We don't keep those on the 3D face map."

Do you recall that testimony?

A Yes.

Q Why do you remove [redacted] and image data that would have been present on the 3D face scan?

A One of the big reasons we do that, that we advertise publicly on our websites, is it helps to prevent risk that we call honeypot risk, which is essentially these images existing somewhere, period. And when I say that, I mean in terms of potential future breaches of a customer or data getting leaked,

[redacted]

1 essentially derisking the storage of that type of data.
2 Q Okay. Let me direct you back to
3 Exhibit 2069. And let's watch the video from about
4 time stamp 1 minute, 25 seconds to about 2 minutes and
5 15 seconds.
6 (Video playing.)
7 BY MR. ARJOMAND:
8 Q So that portion of the video, at least to me,
9 shows a comparison of the 3D face map to a 2D picture
10 of your license; is that correct?
11 MR. STACH: Objection. Form.
12 THE WITNESS: So through the clip that I just
13 watched, I am using our device SDK and our interface to
14 perform a scan using the rear camera of the device that
15 I'm using of both the front and the back of my driver's
16 license.
17 This is a -- this ID scanning, we call it, is
18 a free feature of our platform. So we offer it free of
19 charge to our partners and customers. It allows them
20 to use the interface that's similar to what's shown in
21 the video. And this video is years old, so things may
22 have changed. But an interface like seen in the video,
23 a component of that clip that we just saw is
24 device-side processing of the camera data.
25 We do things like ensure that the document

that you're scanning is within the rectangle that we're drawing to the screen. We do some basic quality determinations on the device. We collect some image data. That gets placed on what we call -- is an ID scan object, which is an encrypted piece of data that includes those images and other data.

Once that ID scan object reaches our server, we do things like OCR. The information from the document, we detect the document type that it is. Depending on the document type, if there's a bar code, we'll attempt to scan the bar code. Depending on the document, if there's an NFC chip, we will attempt to also guide the user through using the user's device to scan the data from the NFC chip, if the user's device is capable of doing this.

A lot of this is configurable by the customer. So they can choose to ignore certain properties, ignore certain responses. They can configure logic to force the user to perform another scan. They can ignore properties and proceed the user through the scan, despite any signals that they may see.

We also attempt to detect whether the document is being presented on the screen or is faked in other ways, whether text has been tampered or

[redacted]

whether the face on the document has been tampered.

One of the parts that I think you were asking about is the face extraction and the matching. So there's a face present on the document, and that document is configured to have that face region extracted and matched. Then we will detect a face on the document that is scanned, and we will perform matching of that face to a 3D face map.

And this all depends on if the customer wants to do this, and they can define their own success criteria. So there is some sort of face-matching going on from the document to the images that are in the 3D face map, but the customer is also free to set their own thresholds. They can also ignore any of the signals that we are giving back to them.

This part of our product is, again, completely free of charge, ultra configurable, and we see a lot of different customers and partners using different aspects about it, prioritizing or deprioritizing different aspects about it and building their own custom logic based on the signals that we give back as a part of this part of our product being integrated into their systems.

BY MR. ARJOMAND:

Q Mr. Rose, is face-matching a separate feature

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[redacted]

from the 3D Liveness Check?

MR. STACH: Objection. Form.

I believe lunch is here, so whenever you're at a good stopping point.

MR. ARJOMAND: Yeah. I only have just literally two or three questions, depending on your answers, and then it would be a natural point to break. So let me see if I can ask that question a little bit more precisely.

BY MR. ARJOMAND:

Q In your previous response, you talked about face-matching between the face map and the 2D picture of the license; is that correct?

A Part of that, I think, is in part of my last response, yes.

Q Yes. I'm not trying to characterize that your entire response was directed to the face-matching between the face map and the 2D picture of your license.

That feature where you're matching a face 3D map to a 2D image, is that a separate feature from a 3D liveness check?

MR. STACH: Objection. Form.

THE WITNESS: Sorry. I think there was a little -- could you repeat that one more time?

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BY MR. ARJOMAND:

Q The feature where you're matching a face 3D -- sorry.

That feature where you're matching a 3D face map to a 2D image, is that feature separate from a 3D Liveness Check?

MR. STACH: Objection. Form.

THE WITNESS: What do you mean by "separate"?

BY MR. ARJOMAND:

Q Does the 3D Liveness Check -- strike that.

Let's say that a FaceTec SDK generates a face map. Are you following me?

A Not particularly.

Q Okay. All right. Once a 3D Liveness Check is performed by the FaceTec SDK, a 3D face map may also be generated; is that correct?

A A 3D face map is generated when the FaceTec server SDK evaluates a 3D face scan for 3D liveness and makes a high-confidence decision that the scan that was performed came from a real human 3D face.

So importantly, for a 3D face map to be generated, we call it 3D liveness must be proven. And the fundamental aspect of doing that is the evaluation of the images that we take of the user at the far distance, the images that we take of the user at the

[redacted]

close distance, the signal extraction from that process, the evaluation of perspective distortion, other distortions, other differences, as well as other signals that we are using to make that high-confidence decision. So once that occurs, a 3D face map is generated.

Q And then is it correct, Mr. Rose, that a 3D face map can be used in subsequent operations of the FaceTec SDK to authenticate a user with respect to a 2D picture or a newly generated 3D face map?

MR. STACH: Objection. Form.

THE WITNESS: Can we try to get to where you're asking in smaller steps? That was a long sentence that was hard for me to parse.

BY MR. ARJOMAND:

Q Okay. So, in the -- let's just ask it this way. What is your understanding of FaceTec's face-matching feature?

MR. STACH: Objection. Form.

THE WITNESS: I would say FaceTec doesn't have just one face-matching feature, so I'm unsure where -- what in particular you're asking about.

MR. ARJOMAND: All right. Let's take a break, and we can follow up after lunch on this.

THE WITNESS: Okay.

(Recess taken from 12:43 to 1:19 p.m.)

BY MR. ARJOMAND:

Q Mr. Rose, during the lunch break, did you speak to counsel on the subject matter of your testimony?

A No.

Q Before the lunch break, Mr. Rose, we were discussing the face-matching feature. And you testified that FaceTec doesn't have just one face-matching feature.

Can you describe to me the various FaceTec face-matching features that you're aware of?

MR. STACH: Objection. Form.

THE WITNESS: We have quite a few different face-matching functions and APIs. Just to clarify, you'd like me to list all of them and describe all of them?

BY MR. ARJOMAND:

Q How about you just start with listing them and not describing them, and we can go from there.

A So each of FaceTec's matching features and functionality around getting what we call a match result and a match level, which equates to some sort of probability for a given match of a false acceptance or a false rejection, all of these are free features that

[redacted]

FaceTec offers on top of FaceTec's 3D liveness, on top of and in addition to and potentially separate from FaceTec's 3D Liveness Detection and Checking feature.

So some of these functionalities include what we call 3D:3D face-matching, 3D:2D face-matching. Within 3D:2D face-matching, we do -- there's a variety of different 3D:2D face-matching that FaceTec offers that are all free features. These include 3D:2D profile picture matching, 3D:2D third-party ID photo matching, 3D:2D kiosk matching, 3D:2D face portrait matching, 3D:2D ID scan matching.

We also offer free 2D:2D matching. We also have versions of some of these APIs that I just mentioned that explicitly operate and output match levels for lower quality -- what we would call lower quality data.

We also offer 1:N and N:N matching. Those are free features as well. We also have versions of those APIs that operate 3D:3D, 3D:2D, and in some cases 2D:2D.

All of that that I just described is from the perspective of now and where I'm sitting today and thinking about the current product offering. Many of those features and APIs that I just described have not been observed in all versions of FaceTec and have been

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[redacted]

added over time.

[redacted]

MR. STACH: Objection. Form.

THE WITNESS: Can you clarify what you mean by "first"?

BY MR. ARJOMAND:

Q Before.

A I don't quite understand the question.

Q What is it you don't understand?

A Can you repeat the question?

[redacted]

MR. STACH: Objection. Form.

THE WITNESS: [redacted], but I think from the perspective of your question, it's a little bit more complicated than that. It's not -- not as simple as the question was phrased.

For instance, a 3D face map that was previously generated may be used at some point in the

[redacted]

near future, in the far future to perform some sort of matching. And so for a given 3D face map, which is the result of a user successfully proving 3D liveness, that piece of data, the 3D face map can be used in a variety of these matching endpoints, APIs, in somewhat of an ongoing fashion by our partners and customers as they build fraud prevention tools that perform matching against 2D images or other 3D images.

We have -- we definitely have customers with use cases who do this type of matching, not immediately after the 3D face map is created, but also over the course of months and years.

BY MR. ARJOMAND:

Q Thank you, Mr. Rose.

So putting aside when the 3D face map is being used by one of your customers, [redacted] performed without the -- without the 3D Liveness Checking performed first or before?

MR. STACH: Objection. Form.

THE WITNESS: Can you repeat that one more time?

BY MR. ARJOMAND:

Q So putting aside when the 3D face map is

[redacted]

being used by one of your customers, [redacted] performed without the 3D Liveness Checking performed first or before?

MR. STACH: Objection. Form.

THE WITNESS: So FaceTec's -- nearly all of FaceTec's entire business is customers and partners paying us for the 3D Liveness Check, the strength of that check, the security of it, the methods and approach that we take to doing it, the primary foundation of that being the capture and analysis of data from the user at the far distance and then the close distance, extracting a signal from that -- extracting many signals from that, including perspective distortion, other distortions and other signals.

Our entire business is rooted in that being the single most important -- I'll say one of the most important things about putting -- about creating a secure remote solution that involves user accounts and identity verification and account creation and log-in and age verification, even ID scanning. Our entire business is rooted in the belief that that is one of the most important things.

[redacted]

So these other matching APIs that you're talking about that operate on the output of a successful 3D Liveness Check, which is the 3D face map, those for a given user who is performing a liveness check and successfully proving 3D liveness, the value add that our customers get from these three features is being able to use -- one of the many value adds is being able to use these additional free APIs, like matching, like age verification and estimation on these 3D face maps after they have been generated.

BY MR. ARJOMAND:

Q Mr. Rose, we've been going for about -- I would say about three and a half hours, and we can go for another three and a half hours or we can try to do this deposition faster, if you can just listen to my questions and answer them.

That last answer was really not responsive to my question. So I ask that you listen to my question and try to answer the question that I ask.

Does that make sense?

MR. STACH: Objection. Foundation. Form.

Please ask your question.

THE WITNESS: Are you waiting for me?

MR. ARJOMAND: No.

/ / / /

[redacted]

BY MR. ARJOMAND:

Q Before the lunch break, you testified, quote, "So importantly, for a 3D face map to be generated, we call it 3D liveness must be proven. And the fundamental aspect of doing that is the evaluation of images that we take of the user at the far distance, the images that we take of the user at the close distance, the signal extraction from that process, the evaluation of perspective distortions, other distortions, other differences, as well [redacted] that we're using to make that high-confidence decision."

Do you recall that testimony?

A Yes.

Q Can you tell me what are the other distortions beyond perspective distortion that you evaluate to make that high-confidence decision?

A So before going into our distortions, I think you mentioned perspective distortion, and I referred to perspective distortion in my declaration -- what's written in my declaration for perspective distortion refers to a dynamic change in the relative sizes or shapes that occur to an observer. And in our case, we're talking about the camera here, where for a 3D object, depending on the distance from the camera the

[redacted]

1 observer is and depending on the specific 3D shape of
2 the object that you're looking at will change in a
3 variety of different ways as you -- as the observer
4 moves closer or further away from the object.
5 So that's how -- that's a big way that we
6 analyze the data that's coming in to determine whether
7 we're looking at a 3D object or not and also whether
8 that 3D object appears to be a face or not via the
9 expected amount of perspective distortion that occurs.
10 [redacted]
20 That's a list of some of the other
21 distortions and differences that are not necessarily
22 perspective distortion.
23 Q As you sit here today, can you think of any
24 other distortions and differences that are not
25 necessarily perspective distortion in making the

1 high-confidence decision that you previously testified
2 about?
3 MR. STACH: Objection. Form.
4
9 And I'd say that there's likely more that I'm
10 not thinking of as I'm sitting here today but that
11 definitely exist.
12 BY MR. ARJOMAND:
13

[redacted]

[redacted]

Q So, when you previously testified about a high-confidence decision -- do you recall that testimony?

A I might have said that a few times.

Q Let me just read that portion that I just read to you about 10 minutes ago. Let me read that to you again.

So you had testified: "So importantly, for a 3D face map to be generated, we call it 3D liveness must be proven. And the fundamental aspect of doing that is the evaluation of the images we take of the user at the far distance, the images we take of the user at the close distance, the signal extraction from that process, the evaluation of perspective distortion, other distortions, other differences, as well [redacted] that we're using to make that high-confidence

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decision."

Do you recall that testimony, Mr. Rose?

A Yes.

Q What did you mean by "high-confidence decision"? Strike that.

What is the high-confidence decision?

MR. STACH: Objection. Form.

THE WITNESS: So when our customers go to integrate our technology, they set up their device SDK, they set up their server SDK, and the user performs a 3D Liveness Check. All of the things that happen that I mentioned in my previous testimony occur.

At the end of the day, what we are providing back to the customer is essentially a true or false answer. So a successor -- when I say successfully prove 3D liveness, as we say, what we mean is that we received enough signal from the variety of checks and analyses and algorithms we're using such that we are extremely confident that what was presented was a real live human being in front of the camera and not some sort of spoof or attack.

BY MR. ARJOMAND:

Q And so you mentioned a variety of checks and analyses and algorithms we're using. One of those would be determining the 3D depth of the user, correct?

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[redacted]

MR. STACH: Objection. Foundation. Form.

THE WITNESS: One more time. When we?

BY MR. ARJOMAND:

Q And so you mentioned a variety of checks and analyses and algorithms we're using to make a high-confidence decision that there's a real live human being in front of the camera and not some sort of spoof or attack. True?

A Yes.

Q Are one of those checks determining whether there's a three-dimensional person using your product?

MR. STACH: Objection. Form.

THE WITNESS: I would definitely not say that it's one check. It's really a system of checks. We have a significant amount of different computer vision and [redacted] and models that run on every single liveness check, 3D liveness check. [redacted]. So it's not just one check. It's many checks that are making this determination on this data that we're collecting from the far distance and the close distance, which is, you know, multiple frames of the far distance, multiple frames of the

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[redacted]

close distance.

So it's definitely not one of those checks. But that area of checks is the most important to what we do. It's the most foundational. It provides us with, in my estimation and in our testing orders of magnitude, better performance from alternatives that use or have available to it this type of signal.

So that's all happening as a part of the 3D Liveness Check, not as one check, as you say, but as many checks. And then on top of that, we have other checks that are running that also give us some benefit as well.

BY MR. ARJOMAND:

Q And what are those, Mr. Rose?

A So we've been over some of them before. [redacted]

[redacted]

1 [redacted]

17 Q So, when you say "So we have these other
18 kinds of detectors and checks that also must succeed in
19 addition to the kind of core foundational 3D
20 perspective distortion extraction signal from the
21 images at two different distances," do you mean by
22 "must succeed" to refer to a high-confidence decision
23 of liveness?
24 MR. STACH: Objection. Form.
25 [redacted]

[redacted]

1 [redacted]

9 BY MR. ARJOMAND:

10 [redacted]

25 / / / /

BY MR. ARJOMAND:

Q Okay. Mr. Rose, let me direct you to your declaration, Exhibit 2059, specifically paragraph 16. Let me know when you've read that paragraph. No. I meant paragraph 16.

A Oh, gotcha. Oh, paragraph 16. I see it.

Q Okay. Let me place in front of you Exhibit 2067. It's been marked "Highly Confidential."

Have you seen this exhibit before, Mr. Rose?

A I have seen it.

Q Did you see it in preparation for today's deposition?

MR. STACH: Objection. Caution you not to reveal any communications that you may have had with counsel. But you may otherwise answer.

BY MR. ARJOMAND:

Q Just a "yes" or "no" is fine, Mr. Rose.

A Yes.

Q Okay. So on the right side of the document, there is a column of text.

Do you see that with numbers 1, 2, 3, 4, 5, 6, 7, 8?

A Yes.

Q And under most of those numbers, there's a reference to source code attachments.

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Do you see that?

A Yes.

Q Have you seen those source code attachments that are referenced in Exhibit 2067?

MR. STACH: Objection. Form.

BY MR. ARJOMAND:

Q To clarify, I'm not asking if you've seen source code of FaceTec. I assume, as the CTO, you have. I'm specifically asking if you've seen a version of this document that attaches the various source code attachments that are listed in Exhibit 2067.

A I have not.

Q Okay. So just taking a look at the first number, No. 1, it refers to FaceTec's software development kit SDK is added to customer's existing app or webpage, and then it says "See source code Attachment A."

Have you seen anything that might refer to that -- strike that.

Have you seen anything that might be that source code Attachment A?

MR. STACH: Objection. Form.

THE WITNESS: I haven't. And I'm not terribly familiar with what this document is or how we used it.

BY MR. ARJOMAND:

Q Okay. So going back to your declaration, paragraph 16, it cites to Exhibit 2067 at No. 2 for your testimony at paragraph 16.

Can you explain to me how Exhibit 2067 at No. 2 supports your testimony at paragraph 16 of Exhibit 2059, your declaration?

MR. STACH: Objection. Form.

THE WITNESS: By "supports my testimony," what do you mean there?

BY MR. ARJOMAND:

Q Why did you cite Exhibit 2067 at No. 2 at the end of your sentence in paragraph 16?

You wrote this declaration, right, Mr. Rose?

A Do you want me to answer that question or the previous?

Q No. The question I just asked.

A I was involved in the creation of this document, yes.

Q So did you draft Exhibit 20 -- strike that.

Did you draft your declaration initially?

A I did not draft my declaration initially.

Q Counsel drafted your declaration for you, and you reviewed it?

MR. STACH: Objection. Caution you not to

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1 reveal attorney-client communications.
2 And I instruct him not to answer this
3 question.
4 BY MR. ARJOMAND:
5 Q Are you going to follow your counsel's
6 instruction, Mr. Rose?
7 A Yes.
8 Q Okay. So turning back to paragraph 16 of
9 your declaration, why did you cite Exhibit 2067 at No.
10 2 at the end of that sentence?
11

[redacted]

1 [redacted]

[redacted]

5 MR. STACH: Objection. Form.

6 THE WITNESS: I'm not necessarily saying

7 that. I'm just saying that the exhibit that's

8 referenced is not completely irrelevant to the

9 statement made in paragraph 16.

10 BY MR. ARJOMAND:

11 [redacted]

21 BY MR. ARJOMAND:

22 [redacted]

[redacted]

1 [redacted]

3 BY MR. ARJOMAND:

4 Q The question that you just framed

5 specifically in terms of the context of 3D liveness

6 detection. [redacted]

19 BY MR. ARJOMAND:

20 [redacted]

[redacted]

[redacted]

Q Okay. Let me direct you to No. 7 in Exhibit 2067. Take a moment to read No. 7 in Exhibit 2067. Let me know when you're done.

A Okay.

[redacted]

Q Let me direct you to your declaration, paragraph 108. You testified that Exhibit 2067 is a document explaining FaceTec's software.

Do you stand by that testimony?

A 2067 explains aspects about FaceTec's software, but it's definitely not a complete picture. There's a lot more to it. So . . .

Q Okay. I mean, you titled Exhibit 2067 above

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[redacted]

paragraph 108 as "FaceTec's Software Explanation."

Do you see that?

A I see it.

Q So you understand Exhibit 2067 as an explanation of FaceTec's software?

MR. STACH: Objection. Form.

THE WITNESS: I would characterize it as an explanation of specific parts of FaceTec software.

BY MR. ARJOMAND:

Q Okay. So let me turn you to paragraph 109. You testified "I hereby certify that the document marked as Exhibit 2067 is a true and correct copy of the document explaining FaceTec's software."

Do you stand by that testimony?

A Sorry. We're talking about 109?

Q That's correct.

A Again, I think, you know, explaining FaceTec software is a bit of a vague statement here. FaceTec software is a lot of things. An explanation of a full and complete and total explanation of FaceTec software cannot be performed in a single page. So I think the spirit of what's written here is that it's an explanation of part of FaceTec's software.

Q Okay. Let me turn you to paragraph 110 of your declaration, Exhibit 2059. You testified "I

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[redacted]

hereby certify that the document explaining FaceTec's software, Exhibit 2067, was made or obtained at or near the time of occurrence of the matters set forth in the record, by, or from information transmitted by, a person with personal knowledge of those matters; was kept in the course of regularly conducted business activity; was created or obtained as a regular business practice; and is the type of information created, obtained, and used in the ordinary course of business."

Do you see that?

A Uh-huh.

Q Do you stand by that testimony, Mr. Rose, in paragraph 110 of your declaration?

A I think so. As I said, I'm not super familiar with this version of this document. I have seen a lot of the verbiage contained in here on various documents that we've put out, both publicly and privately.

You know, icons I can see that are on our website, verbiage that's on our website, verbiage that I think I've seen on other internal documents that we've created for internal use or for sending to potential customers. There's familiar aspects to a lot of what's in this document that's been produced.

Q What -- on what basis did you make the

[redacted]

statements in paragraph 110 of your declaration with regard to Exhibit 2067?

MR. STACH: Objection. Form.

THE WITNESS: You're asking on what basis did I?

BY MR. ARJOMAND:

Q Make the certification that you did in paragraph 110 of your declaration with respect to Exhibit 2067.

MR. STACH: Same objection.

THE WITNESS: I think that, at the time that -- when I reviewed this document to -- as a part of my review of this document, I at the time agreed to these statements that I'm saying. I suppose that's what I mean by that.

BY MR. ARJOMAND:

Q Has your mind changed from the time you made the certification in paragraph 110 to now, given that you've had some time to review Exhibit 2067 during your deposition?

MR. STACH: Objection. Form.

THE WITNESS: Has my mind changed about?

BY MR. ARJOMAND:

Q About whether this is -- Exhibit 2067 is an explanation of FaceTec's software.

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[redacted]

1 MR. STACH: Objection. Form.
2 THE WITNESS: I guess from a logic
3 perspective, something can be an explanation of
4 software, but not be a full explanation of software and
5 still be an explanation of software.
6 BY MR. ARJOMAND:
7 [redacted]
24 BY MR. ARJOMAND:
25 Q Mr. Rose, you relied on this document in your

[redacted]

declaration, Exhibit 2059; is that correct?

A Yes.

Q And you studied this document before today's deposition; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: I wouldn't say I studied it. I saw it.

BY MR. ARJOMAND:

Q And did you see Exhibit 2067 when you prepared your declaration?

A It was a part of something that I saw when I reviewed my declaration, yes.

Q So do you stand by Exhibit 2067 as you sit here today?

MR. STACH: Objection. Form.

THE WITNESS: Can you clarify what you mean by "stand by"?

BY MR. ARJOMAND:

Q Do you think that it's an accurate representation, specifically Exhibit 2067, of FaceTec's software?

[redacted]

[redacted]

1 [redacted]

[redacted]

[redacted]

Q So in paragraph 6 of your declaration, you say at the bottom there, "3D liveness detection technology seeks to ensure that a living 3D person is present in front of the camera at the time the biometric data is collected."

Do you think Exhibit 2067 is an accurate description of FaceTec's detection technology with respect to making a high-confidence decision that a 3D person is present in front of a camera at the time the biometric data is collected?

MR. STACH: Objection. Form.

THE WITNESS: Sorry. That was a really long sentence. Could you repeat?

BY MR. ARJOMAND:

Q Do you think that Exhibit 2067 is an accurate description of FaceTec's detection technology with respect to making a high-confidence decision that a 3D person is present in front of a camera at the time the biometric data is collected?

MR. STACH: Objection. Form.

THE WITNESS: By "accurate," do you mean a full and complete picture down to every detail of what

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[redacted]

I mean by 3D detection, seeking to ensure that a living 3D person is present in front of the camera at the time the biometric data is collected?

BY MR. ARJOMAND:

Q Well, let's start with that.

A I'd say this document describes portions of that description.

Q The portions that it describes, are they accurate, in your opinion?

A And are you talking about with respect to our current version or the version at the time this was created or . . .

Q Well, do you know when this document was created, Mr. Rose?

A I don't.

Q Well, why don't we first start with when you think this document was created, which I assume was prior to the current version of your product.

MR. STACH: Objection. Form.

THE WITNESS: I'm not sure when this document was created.

BY MR. ARJOMAND:

Q Okay. So I'm just -- I'm going to ask you the question again, Mr. Rose.

You testified that this document describes

1 portions of FaceTec's 3D Liveness Detection technology
2 making a high-confidence decision that a living 3D
3 person is present in front of the camera at the time
4 the biometric data is collected.
5 And what I'm asking you is, are those
6 portions that are described in 2067 accurate?
7
9 Q Anything else?
10
12 Q Anything else?
13

[redacted]

[redacted]

/ / / /

1 BY MR. ARJOMAND:

22 BY MR. ARJOMAND:

[redacted]

1 MR. STACH: Objection. Form.
2 THE WITNESS: Could you please repeat the
3 question?
4 BY MR. ARJOMAND:
5 [redacted]
8 MR. STACH: Objection. Form.
9 When you get to a stopping point.
10 MR. ARJOMAND: I'm very close.
11 MR. STACH: I'm trying not to interrupt.
12 MR. ARJOMAND: I appreciate that, Jason.
13 [redacted]

[redacted]

[redacted]

BY MR. ARJOMAND:

Q Thank you, Mr. Rose. But let me just ask my question again.

I'm asking you, is the high-confidence decision that's made at the end of the process that's shown here in 2067 based on more than determining whether the user is three-dimensional?

MR. STACH: Objection. Form.

THE WITNESS: I already mentioned that the document is a simplification of the way FaceTec software works, but related to your question, I speak about throughout my declaration how there are more checks and signals that are evaluated than just -- I believe you said 3D.

BY MR. ARJOMAND:

Q Three-dimensionality.

A Three-dimensionality.

Q Okay.

MR. ARJOMAND: Let's take a break.

(Recess taken from 3:16 to 3:31 p.m.)

BY MR. ARJOMAND:

Q So, Mr. Rose, let me direct you back to your declaration, Exhibit 2059, specifically the portion of your declaration related to the Spoof Bounty program beginning at paragraph 29 and going through paragraph 33.

Mr. Rose, have there ever been any payouts in FaceTec's Spoof Bounty program?

MR. STACH: I think that may be confidential if there have been. I don't know what he's going to say.

MR. ARJOMAND: Well, he can answer first, "yes" or "no."

MR. STACH: I think that might even be confidential. If you want to have someone drop off, if they're on. I don't even know. I can't tell if they're on. Yeah. If you want to have Ms. Bradley drop off, he can answer completely if you want, or you can ask a different question.

[redacted]

MR. ARJOMAND: Let me put that question on hold because there might be more confidential questions later in the deposition, and I can ask it at that time.

BY MR. ARJOMAND:

Q So let me direct you to paragraph 30 of your declaration, Mr. Rose.

In paragraph 30, you state that participants are given access to FaceTec's Spoof Bounty program.

What do you mean by "given access"?

A The Spoof Bounty program, since we've had it implemented and live since October of 2019, is a public website that anyone can access at any time. But I think in this context where we're saying -- where I'm saying participants are given access, it means that the user who is using the Bounty program must agree to terms and conditions prior to the Spoof Bounty program being made available to them.

Q I understand that the user or users, in your opinion, must agree to certain restrictions, but what I'm asking you is, what do you mean by giving access?

If it would help, let me direct to you paragraph 32 where you say "Participants are granted special access to FaceTec's 3D liveness technology."

A All that is meant by this in plain English is that the user prior to using the Spoof Bounty program,

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so before they are able to attempt to spoof or to test it out, they see a UI where they agree to terms and conditions prior to being able to use the software.

Q Are they able to see under the hood?

MR. STACH: Objection. Form.

THE WITNESS: So by "they" do you mean any user of the Bounty program?

BY MR. ARJOMAND:

Q That's correct.

Are they able to see under the hood of the FaceTec Zoom software or its current version?

MR. STACH: Objection. Form.

THE WITNESS: And what do you mean by "under the hood"?

BY MR. ARJOMAND:

Q Are they able to see the code?

MR. STACH: Objection. Form.

THE WITNESS: In any of our -- of FaceTec's demo apps, the Bounty program, or any of our customers who implement our -- implement and integrate our device SDKs into their applications, it is possible for an attacker, a user, a penetration tester to attempt to see what our front-end software might be doing through means like decompilation of binaries, reverse engineering of binaries, deobfuscation, using developer

[redacted]

tools that are built into the browser or built into iOS or Google's tools. There are also other third party tools that can be used to attempt to view the binaries or code that may be shipped into the front end. So that is generally possible.

BY MR. ARJOMAND:

Q Well, my question is slightly different, Mr. Rose. I'm saying, does a participant in FaceTec's Spoof Bounty program have access to the software that FaceTec utilizes to make a 3D liveness determination?

MR. STACH: Objection. Form.

THE WITNESS: I don't know what you mean by "access."

BY MR. ARJOMAND:

Q Do they get to see the software that FaceTec utilizes to make a 3D liveness determination, Mr. Rose?

MR. STACH: Objection. Form.

THE WITNESS: Well, they don't get any form of access to FaceTec's server or the FaceTec server SDK or the back-end code or the back-end API code. They're able to load the front end. So, in a browser that would be loading a website, later down the line, we added the Bounty program to our iOS and Android apps. So the -- what a Bounty program user does is they load -- they go into a browser and they load a webpage.

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They type in Bounty.FaceTec.com. That loads a page with a form that asks them to enter their email address and contains a check box that they agree to the terms and conditions for the Spoof Bounty program, which contains a link to those terms and conditions.

Once they do that, they see a page that has a button on it. That button launches our device SDK, just as it would in a real customer app. So for a Bounty user, we're -- that's what we mean by "given access." They are able to load that page, perform spoof attempts. And a Bounty user could definitely use developer tools or decompilation methods to inspect the binaries or other files that are served that control the operation of FaceTec's device SDK.

BY MR. ARJOMAND:

Q Is it correct, Mr. Rose, that FaceTec's server SDK makes the high confidence 3D liveness decision based on perspective distortion?

MR. STACH: Objection. Form.

THE WITNESS: We were just talking about the Bounty program. Are you asking in the context of the Bounty program, or are you asking --

BY MR. ARJOMAND:

Q I'm just asking you, just generally, is it correct that FaceTec's server SDK makes the liveness

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decision based on perspective distortion? Is that correct?

MR. STACH: Objection. Form.

THE WITNESS: As I've explained in previous testimony, the interaction that the user has with the device SDK is a critical component. It guides the user to perform the capture at the far distance and the close distance. It analyzes signals. It creates a payload that we call a 3D face scan. That 3D face scan object is sent to the server. The server analyzes the data that we've decrypted, unpacked, and deserialized from that object. We analyze a variety of signals from that rich set of data that we have collected on the device SDK side, analyzing for signals like perspective distortion, the 3D nature of the capture. We analyze it for expected differences between the far and the close image.

MR. STACH: I'm going to caution you not to reveal anything that is FaceTec confidential that you would not have Jumio's counsel here as part of this answer.

THE WITNESS: We perform other checks. And as a part of all of that analysis, we come to a high confidence 3D liveness decision that's then in a customer integration output to the customer, and they

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[redacted]

use that to determine what the answer from FaceTec is on this process.

BY MR. ARJOMAND:

Q Given that process flow, a participant in FaceTec's Spoof Bounty program wouldn't have access to the server SDK; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: The general Bounty user does not have access to any part of the FaceTec server SDK. But they do have the entire device SDK loaded onto their device and could do things like reverse engineer the library, decompile it, try to figure out aspects about what we were doing, try to find sensitive areas of code, and try to understand -- they could definitely use the device SDK to try to understand how we're doing the two distance capture and what types of signals we might be looking for.

BY MR. ARJOMAND:

Q Mr. Rose, a participant in FaceTec's Spoof Bounty program does not have access to the code underlying the server SDK; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: A Bounty user definitely would not have access to a server SDK code or binaries, but Jumio certainly had access to FaceTec server SDK

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[redacted]

binaries.

BY MR. ARJOMAND:

Q Mr. Rose, what is a developer account?

MR. STACH: Objection. Form.

THE WITNESS: I think my answer might go into confidential areas.

BY MR. ARJOMAND:

Q Okay. We can hold off on that.

Let me place in front of you Exhibit 2037.

Do you recognize this document, Mr. Rose?

A Yes.

Q Mr. Rose, did FaceTec pay for this certification?

MR. STACH: Objection. Form.

THE WITNESS: Any testing lab that we've ever worked with charges for their services, and iBeta charges for their services.

BY MR. ARJOMAND:

Q Okay. In paragraph 2 of Exhibit 2037, it refers to FaceTec ZoOm version 6.9.11.

Do you see that?

A Yes.

Q You indicated earlier today that you were at FaceTec ZoOm Version 10; is that correct?

MR. STACH: Objection. Form. Foundation.

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THE WITNESS: We released Version 10 around last September. We currently ship updated versions to both Version 10 and Version 9. So we actually have a latest version of Version 9 as well, and it's 10-point-something-point-something. It's not just Version 10.

BY MR. ARJOMAND:

Q Okay. And was FaceTec ZoOm Version 1 the first software that was sold to the public?

MR. STACH: Objection. Form.

THE WITNESS: I know we had a Version 1, but I don't have information about which version was the first version that we had a paying customer for.

BY MR. ARJOMAND:

Q Do you recall when FaceTec first sold its ZoOm software as a product?

MR. STACH: Objection. Form.

THE WITNESS: I don't -- I don't know which version or which date was the first version or date where we had a paying customer for what is now our FaceTec device and server SDKs.

BY MR. ARJOMAND:

Q So I asked you, "Do you recall when FaceTec first sold its ZoOm software as a product?"

A To me, what that means is when did we have

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[redacted]

our first customer who paid us, and I don't recall.

Q Was it in 2017?

A It may have been, but I don't recall.

Q Was it in 2018?

MR. STACH: Objection. Form.

THE WITNESS: We definitely had revenue in 2018, but I think we had some paying customers before then.

BY MR. ARJOMAND:

Q The very first version of FaceTec's ZoOm product that was sold, did that include a three-dimensionality check?

MR. STACH: Objection. Form.

THE WITNESS: All versions of what is now FaceTec's device SDKs and FaceTec's server SDK contained a two-distance capture. The ovals that allow the user to receive guidance for where to put their face in the frame and the processing of signals that are apparent from the presentation of a real human face at the far and the close distance, which creates perspective distortion, other distortions [redacted] that we use to derive a 3D signal, all versions would include techniques and that type of processing in order to make decisions.

/ / / /

BY MR. ARJOMAND:

Q Decisions on liveness?

A The decision as to the 3D liveness of the user, whether the user is there, it's a human face there in the flesh and present.

Q So, turning back to Exhibit 2037, that iBeta document, in the second-to-last paragraph, it refers to a Level 2 PAD test effort.

Do you know what a Level 2 PAD test effort is, Mr. Rose?

A I believe Level 2 in this context maps to a similar description that I have in my declaration on paragraph 31 where the Bounty program levels are stated. So, as we have stated here, Level 2, commercially available lifelike dolls and resin, latex, and silicone 3D masks up to $300 in price.

So there's a distinction that we've defined on the Bounty program as far as levels, Levels 1, 2, 3, 4 and 5.

In parallel, there is also a specification that ISO came out with called 30107, which is also mentioned in this exhibit that contains a letter from iBeta. In that specification, I believe there is also a breakdown or at least a framework of breaking down presentation attacks into levels.

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[redacted]

So I believe, whether it's the ISO 30107 definition or the definition that we see for Level 2 on our Bounty program, that would be the type of presentation attack samples that would have been tested in this testing effort.

Q So is it your understanding that Exhibit 2037, the iBeta letter, is not based on 2D photo video impersonation attacks?

MR. STACH: Objection. Form.

THE WITNESS: It -- can you repeat the question?

BY MR. ARJOMAND:

Q Sure.

So is your understanding that Exhibit 2037, the iBeta letter we've been discussing, is not based on 2D photo or 2D video impersonation attacks?

MR. STACH: Objection. Form.

THE WITNESS: Well, it says it here in the letter: "The six artifacts or species used in the test effort were two lifelike dolls, two realistic latex masks, one custom-made resin mask and one realistic silicone mask."

So that doesn't sound like the description that you just said.

/ / / /

BY MR. ARJOMAND:

Q Okay. And with regard to the threat vector scale in FaceTec's Spoof Bounty program that you just mentioned, why did you add additional Levels 4 and 5 compared to the ISO specification that you cited?

MR. STACH: Objection. Form.

THE WITNESS: Since the very beginning, I would say that FaceTec's thought process around thinking about security, thinking about this liveness detection challenge has been unique and has, in my opinion, been ahead of the curve.

We were working on prevention of attacks within Level 1, 2, and 3 before there was even an ISO standard. We set out kind of at the beginning of the formulation of our company to create something that was security first. Security has been a primary driver for us. That's actually been a -- something that we found in the industry as not shared amongst different competitor companies. Some companies think that it's okay to have fraud -- have some amount of fraud. FaceTec has always come from a standpoint that we want to create something that is virtually impossible to spoof.

So, from the very beginning, we've been thinking deeply about this problem. These

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conversations are how -- thinking and talking about things in this area is how we kind of started to, you know, think about all of the possible ways that a system like ours can get attacked.

BY MR. ARJOMAND:

Q Spoofs continue to evolve beyond 2D photo and 2D video impersonation attacks; is that correct, Mr. Rose?

MR. STACH: Objection. Form.

THE WITNESS: The spoof and security landscape definitely evolves. New platforms come out, new platform versions come out, new hardware comes out, new tools for attackers to use. And we came out with Level 4 and Level 5 on the Spoof Bounty program before there were any types of standards for testing that as well.

MR. ARJOMAND: Okay. Let's take a short break. I'd like to ask some of those questions that you all believed could potentially trigger confidential information, and then we can wrap this up.

(Recess taken from 4:19 to 4:26 p.m.)

BY MR. ARJOMAND:

[redacted]

1

[redacted]

[redacted]

BY MR. ARJOMAND:

Q Let me direct you to your declaration, Exhibit 2059, specifically paragraph 49. Take a second to read that paragraph to yourself and let me know when you're ready.

A Sounds good.

Q So you say "3D liveness checks are multilayered" in lines 2 and 3 of that paragraph.

Do you see that?

A Yes.

Q Can you explain what you mean by "multilayered" in paragraph 49 of your declaration?

A So the way that I think about the security we provide and the engineering that takes place and the components of the 3D liveness check, there are layers of security.

So a layer you can think about as a check or a group of checks, could be many checks, that are responsible for analyzing and operating on a certain set of signals and making a decision on a specific set

[redacted]

of things. Could be a type of spoof. It could be an attack method. Could be a common aspect about attacks that span many different attack methods.

And so what I mean by "layer" and "multilayered" in this context is that -- and I think I've described this in my testimony today -- is we have many layers of checks. And I think paragraph 49, what I mean in the full explanation of paragraph 49 or what that is talking about is that the primary -- the primary layer in our software is the comparison of these images taken at different distances and ensuring that they truly have the expected differences that one would expect when analyzing a real live human face. So things like perspective distortion, and there's many, many other differences that turn out to be signals that we can use to leverage to make a very high confidence security decision on a given scan that the user performs.

Q So, when you say "many other differences," would that be the other layers?

MR. STACH: Objection. Form.

THE WITNESS: No. That would not be the other layers. That would be the differences inherent in the underlying data that produce signals that even this first layer, this primary layer, operates on and

extracts because the signal is -- the signal that we've been able to extract from the rich data that's provided from the near and the far capture that the user performs provides this data that has these signals from which we can build layers of security.

BY MR. ARJOMAND:

Q What are the other layers, Mr. Rose?

[redacted]

Q Are there any other layers that you can think of as you sit here today beyond what you just testified about?

A There are probably more, but that's what I can think about as I'm sitting here in this moment.

Q Do you do a passive liveness check on the data that's received by the server SDK?

MR. STACH: Objection. Form.

THE WITNESS: "Passive liveness check" is a heavily loaded term with a lot of different definitions depending on who you talk to. It's not something we use on the product building or the technology side. So I don't think I can provide a good answer to that general question.

BY MR. ARJOMAND:

Q Let me ask you it this way: You say that you extract signals from the data that you obtain from the user being near and far in their use of the smartphone.

Do you recall that testimony?

A Was that something I just said or?

Q Yeah. You said "The signal that we've been able to extract from the rich data that's provided from the near and the far capture."

Do you recall that?

A Sounds -- sounds like something I said.

Q So you have this rich data that you've obtained that's, in your words, from the -- that's encrypted and sent to the server side SDK, correct?

MR. STACH: Objection. Form.

THE WITNESS: That statement, I think, was a generalization of what I said. I'm not sure how to agree or disagree with that.

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BY MR. ARJOMAND:

Q Okay. You understand that the server SDK analyzes the encrypted face scan, correct?

MR. STACH: Objection. Form.

THE WITNESS: Part of our software and part of 3D liveness checks includes the creation of that 3D face scan object that you mentioned that I've explained what it is before. And the server does take that as an input, decrypts that, deserializes it, unpacks it, and utilizes the data inside of it to analyze the signal from the images that -- and other data that exist in the 3D face scan.

BY MR. ARJOMAND:

Q Okay. So when the SDK -- strike that.

When the server side SDK utilizes the data to analyze the signal from the images and other data that exists in the 3D face scan, does it look for specific human traits?

MR. STACH: Objection. Form.

THE WITNESS: I described aspects about the question that you have in various points in my declaration.

BY MR. ARJOMAND:

Q I just want to understand, Mr. Rose, when the server side SDK utilizes the data to analyze the signal

[redacted]

1 from the images and other data that exist in the 3D
2 face scan, does it look for specific human traits
3 beyond whether the user's face is three-dimensional?
4 MR. STACH: Objection. Form.
5 THE WITNESS: I'm not quite sure what you
6 mean by "human traits."
7 Is there a way you could ask that question
8 more specifically or differently.
9 BY MR. ARJOMAND:
10 [redacted]
21 BY MR. ARJOMAND:
22 [redacted]

[redacted]

[redacted]

BY MR. ARJOMAND:

Q Mr. Rose, I think we're running out of time, so let me just ask you a few more questions.

Paragraph 48 of your declaration.

You state in the first sentence "[redacted] the only feature customers paid for was the performance of 3D liveness checks."

What happened [redacted]?

A [redacted] we -- I would say two things happened.

So we created a paid feature in the FaceTec device and server SDK that we call "official ID photo output." And what that feature does is, in addition to performing a 3D liveness check, we perform extra checks on the capture that the user is performing in order to ensure that the image that we provide back to customers when a successful liveness -- 3D liveness check occurs essentially is configurable to meet standards like ICAO where that standards body, ICAO, or ICAO we call it, has standards for the quality of images that can be used on your passport. There's also other standards

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[redacted]

bodies that have different requirements for placing your photo onto a driver's license.

So this feature allows our customers to do a 3D liveness check but also have -- has extra logic and functionality so that, at the same time, they can get a photo of that user that can be immediately used to print onto passports and to driver's licenses so users don't have to go to the DMV or to a photographer or Walgreens or something like that to have their picture taken. They can just do it remotely after having done the 3D liveness check. So that's number one. And then number two our new UR codes product.

Q I think I'm familiar with that.

Let me direct you to paragraph 49 of your declaration. You state in paragraph 49, first sentence, "Many customers use FaceTec's software solely for the performance of 3D liveness checks and nothing else."

Do you see that?

A Yes.

Q Do you know if Jumio licensed more than just the 3D liveness checks?

MR. STACH: Objection. Form. Calls for a legal conclusion.

THE WITNESS: I'm not a contracts expert and

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I'm not a lawyer. I have seen the Jumio FaceTec contract before, and I know that they were using features beyond 3D liveness checks. But to the extent of what they were under contract for, that would be beyond my area of expertise.

BY MR. ARJOMAND:

Q Thank you.

MR. ARJOMAND: And Mr. Stach, that was a coaching objection, and you know it. I'd appreciate if you not make those coaching objections. That's not allowed.

MR. STACH: I disagree, but I will -- noted. I will disagree, but noted.

MR. ARJOMAND: Okay. All right. Let's take a break.

(Recess taken from 5:01 to 5:11 p.m.)

BY MR. ARJOMAND:

Q So, Mr. Rose, let me direct to you paragraph 52 of your declaration.

A 52?

Q Yes.

Do you see that table in paragraph 52?

A Yes.

Q You show revenue in 2018, 2019 and 2020, correct?

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A Yes.

A So the way that we count how we get 3D -- the way that we count our volumes, the way that we know that a 3D liveness check happens is when a customer or partner sets up the FaceTec server software, when there is a liveness check that occurs, a log is output to a text file that contains an indicator that a 3D liveness check was performed. That log doesn't contain image data or personally identifiable information. But nevertheless, that log, if it gets output anytime there's a 3D liveness check, needs to be sent to FaceTec so that we can count the usage and so we can invoice and bill our customers and partners.

[redacted]

1 [redacted]

17 Q Okay. There's an exhibit in the proceedings,
18 Exhibit 2040, that's a letter from Praetorian.
19 Do you know who Praetorian is?
20 A Do you have the exhibit?
21 Q I don't have the exhibit. We can put it on
22 Exhibit Share for you to see it.
23 A Yeah. That would be great.
24 MR. STACH: I happened to bring hard copies
25 of everything.

MR. ARJOMAND: Okay. Wonderful.

MR. STACH: If you're amenable.

MR. ARJOMAND: Yes. Thank you. I appreciate that, Mr. Stach.

BY MR. ARJOMAND:

Q I just had one question with respect to Exhibit 2040, Mr. Rose.

A Uh-huh.

Q It talks about doing an application penetration test and a mobile penetration test.

Do you know what those tests are?

A I know at a high level what this engagement was about. The exact phrasing of "Application Penetration Test," I'm not sure what that means. But in this overall effort, we contract this company called Praetorian to do penetration testing, reverse engineering, vulnerability finding, threat detection, decompilation, assessment of obfuscation and security controls that exist in FaceTec's SDKs. That's generally what this document is about. I'm not 100 percent sure on the application -- the specific verbiage of "application penetration tests" and "mobile penetration tests."

Q Do you know if it's a cybersecurity test, Mr. Rose?

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MR. STACH: Objection. Form.

THE WITNESS: Cybersecurity is a big topic. It's a whole industry. The word "cybersecurity" means a lot of different things to a lot of different people.

Some would say FaceTec software is a cybersecurity product. Some people might say it's something else more constrained or something different.

I think Praetorian would probably say that some of the testing that they do is cybersecurity. But this was an engagement with cybersecurity who -- with -- an engagement with -- sorry -- an engagement with Praetorian, who has many, many experts on their team, security experts, platform experts, you know, language experts, reverse engineering experts. And this engagement was related to them attempting to find vulnerabilities, attack vectors, and issues with obfuscation, other types of issues when testing our SDKs from a black box perspective.

BY MR. ARJOMAND:

Q Okay. I previously asked you "What is a developer account?" Do you recall that?

A Yes.

Q What is a developer account, Mr. Rose?

MR. STACH: Objection. Form.

THE WITNESS: So I talk about developer

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[redacted]

accounts in my declaration as it relates to [redacted]

Is that what you're asking about?

BY MR. ARJOMAND:

Q [redacted] what's a developer account in -- with respect to the FaceTec software?

MR. STACH: Objection to form.

THE WITNESS: What I would describe a FaceTec developer account is from -- from my perspective and the way that I think about it is, we have a website at dev.FaceTec.com that contains documentation about our product and our platform and our technology. Parts of that site are public and don't require anything -- any special steps to access, but parts of that website require you to provide FaceTec an email and agree to terms and conditions and provide your name and your company's name to access.

So, when you sign up on our developer website for -- through this form, you receive an email that contains a link that allows you to log into our developer website.

Once you have access to our developer website, you can see additional documentation. You can see information about your account. You can see -- you

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[redacted]

can download FaceTec's device SDKs.

So a developer -- so that creates a record in our system for that email and interaction and the data that was submitted. It generates a -- what we call a device key identifier that is used so that when you download and use the device SDK, you're authorized to use it when you are initially testing before you become a FaceTec customer.

BY MR. ARJOMAND:

Q Mr. Rose, would a developer get access to the software of the server SDK under the developer account?

MR. STACH: Objection. Form.

BY MR. ARJOMAND:

Q And by "access" I mean to be able to see the code of the server SDK.

MR. STACH: Objection. Form.

THE WITNESS: So I was in the middle of explaining the full process when you asked that question.

Once a user has access to the developer site, they get access to the device SDK. They do not get access to the server SDK, FaceTec server SDK.

At that point, a developer account has been created, but there are different states of a developer account. So, in that state, the developer is not yet a

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[redacted]

customer. So they only have access to the device SDK. They can download it. They can use it according to our terms and conditions. They can test it.

And at some point, there's a conversation that is had between the -- the entity that's signing up for this developer account -- so at this time, to us, they're a lead. So our sales and business development team will have a conversation with them. They'll negotiate a contract, they'll sign a contract, become a paid customer.

And at that point, that developer account, which may include various emails of users at that company -- could be multiple companies -- that account, once they become a paying customer, we enable access to the server SDK to that developer account. At that point, the -- they're able to download the FaceTec server SDK.

Inside of the FaceTec server SDK is a variety of things. There's a binary that contains the primary set of functionality that has been the topic of today's discussion. That exists in binary format. That binary is ran by the customer in their own infrastructure. They integrate it into their own infrastructure. We also provide code and documentation inside of that server SDK zip that shows how to interact with the

FaceTec server functionality.

So, at that point, when they're integrated, they -- the -- that developer who has access to that to be able to download the FaceTec server SDK has access to the server component of the performance 3D liveness detection and a variety of the rest of our functionality.

BY MR. ARJOMAND:

Q And when you say "has access to the server component of the performance 3D liveness detection and a variety of the rest of our functionality," by "access," you mean they can actually see the code?

MR. STACH: Objection. Form.

THE WITNESS: There is code in the software package that is downloaded, but what we ship as far as the core part of both our device SDK and server SDK is binary. So it's a binary library. So it contains functions and functionalities. Those functions and functionalities can be attempted to be reverse engineered by -- via decompilation and a variety of other tools that someone seeking to reverse engineer our software, how to use it, what it's doing, [redacted], how we're extracting the signals from the two different distances. That all can be attempted on both the device SDK and the server SDK if you have those

[redacted]

binaries in your hand.

BY MR. ARJOMAND:

Q But if a person doesn't make the attempts that you just testified about, they won't have access or specifically won't be able to see the server SDK code; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: Someone like Jumio who is seeking to understand a deeper understanding about how FaceTec does what it does could take simple steps to attempt to use the special access that they have to our binary to attempt to reverse engineer how FaceTec is doing what we're doing.

MR. ARJOMAND: Okay. I have no further questions subject to any redirect by counsel.

MR. STACH: Can we take a few minutes break? I do have a few questions for Mr. Rose that I'd like to ask.

(Recess taken from 5:38 to 5:42 p.m.)

EXAMINATION

BY MR. STACH:

Q If you could turn in your declaration, Exhibit 2059, to paragraph 11, please.

Can you review paragraph 11 for me, please, just to yourself.

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A Yes.

Q Do you believe paragraph 11 is an accurate characterization of how FaceTec's software operates?

MR. ARJOMAND: Objection. Leading.

THE WITNESS: Yes, I do.

BY MR. STACH:

Q What is your basis for that understanding?

A I've been involved in writing the code and seeing the code that does this and the systems that perform this.

(Interruption in proceedings.)

THE WITNESS: I think I was saying that because I've been involved in writing the code, reviewing the code, seeing the code and the systems that are involved in taking the frames from the camera, processing and also ensuring that the data that we collect and analyze during this part of the process is from the far distance as the user is aligning their face. So I'm familiar with the systems that I'm talking about here.

BY MR. STACH:

Q So what versions of FaceTec software does the statement in paragraph 11 apply?

A All versions of FaceTec software have done what I'm describing here.

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Q What is the basis for your statements in paragraph 12 of your declaration?

A Same answer. I've been involved in the creation of the system that does this, reviewing the -- reviewing the data that we collect as we do this, building algorithms and methods of extracting the signal that we obtain by receiving and, you know, capturing the images that we receive at both the far and the close distance, the first and the second image.

Q What versions of FaceTec software function the way you describe in paragraph 12?

A All versions have this -- all versions that we've created have had this functionality.

Q What is the basis for your statement in paragraph 13 of your declaration?

A Sorry. What was the basis for?

Q What is the basis for your statement in paragraph 13 of your declaration?

A So, in our system, the user action that we trigger by engineering the UI in the way that we have has kind of the stated goal of having the user change the distance between themselves and the camera. So it's a fundamental aspect of what we do.

And so this behavior of getting the user to move the device, move the camera closer to their face

or moving their face closer to the camera in a relatively straight line is something we have been thinking about since the very beginning.

Q And how do you know that to be true?

MR. ARJOMAND: Objection. Leading.

THE WITNESS: The primary thing that we've worked on since Kevin had the idea to do this two-distance capture and extracting signals that might be apparent in the images and other data as the user does that, that's been a primary focus of every version of our product. So essentially, it's always -- it's always been a focus. And it's been a focus for a very long time.

BY MR. STACH:

Q What is the basis for your statements in paragraph 14 of your declaration?

A So paragraph 14 talks about guiding the user to capture the images at the first distance and the second images at the second instance, which is by using these ovals that are displayed to the screen as a guide. And that is something that has been in the technology for so long that I have a good basis and understanding of how that works and how important it is for our product.

Q What types of information do you have access

[redacted]

to related to FaceTec's product operation?

A I would say I have full access to all or a significant amount of the systems that we've built.

Are you referring to the CRM or something else?

Q I'd just like to move on.

I'm wondering which versions of FaceTec software function in the manner described in paragraph 14 of your declaration.

A All versions of FaceTec software have operated in the manner described in paragraph 14.

Q On what information do you base the statements in paragraph 15 in your declaration?

A The basis for that statement is, again, my experience working on this two-distance capture and the signal extraction from that two-distance capture.

So the basis is partly rooted in that and partly rooted in -- as it relates specifically kind of to what I'm saying in there is that there is more opportunity to extract signal when the user performs a session or performs a scan with our technology if the user's facial expression is held steady. And that's not to say it can't work, but it's a statement of what's better for signal extraction and processing the data that we receive as the user performs the scan.

[redacted]

Q Which versions of FaceTec software function as described in paragraph 15?

A The statements in paragraph 15 would apply to all versions of FaceTec.

Q On what information do you base the statements in paragraph 16 of your declaration?

A My basis for this statement would be my experience developing [redacted] looking at data that exhibits the effects that I'm talking about in paragraph 16 and, specifically, building aspects of FaceTec software that can do what is claimed here in paragraph 16, also working with the team who has worked on this as well.

Q On what information do you base the statements in paragraph 17 in your declaration?

A My basis for this, again, comes from experience working on this topic since basically the outset of FaceTec. Working with the data captured at two different distances and analyzing for expected differences has been -- extracting that signal has been something that's been a topic on my mind for -- and I have a lot of -- for a long time, and I have a lot of experience with it. And that's the basis for my statements in paragraph 17.

Q Which versions of FaceTec software function

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as described in paragraph 17?

A All versions of FaceTec software would have.

Q On what information do you base the statements in paragraph 18 of your declaration?

A Again, this goes to a fundamental topic that I personally worked on for a very long time, thought about a lot, built technology around, seen the code in our product that does this, looked at the data in our datasets that have these differences, looking at the strength of that signal that we get by having this two-distance capture.

Q Which versions of FaceTec software function as described in paragraph 18 of your declaration?

A It's something that all versions of our software would have systems built to pull signals from and make decisions on.

Q On what information do you base the statements in paragraph 19 of your declaration?

A The knowledge that our technology is evaluating expected distortions that are caused by a capture and analysis of images at two different distances. The knowledge that these effects exist and that a technology can be built to analyze that and extract the signals has been a topic that I've focused on for a very long time, reviewed a lot of data,

created code, and been part of others creating code to analyze everything that I'm talking about here in paragraph 19.

Q Which versions of FaceTec software function as described in paragraph 19?

A All versions of FaceTec software would be looking at these types of expected distortions and making decisions on them.

Q On what information do you base the statements in paragraph 20 of your declaration?

A My basis for this statement is I'm very familiar with the system surrounding what it is I'm describing here. I have written code in and around it. I have reviewed others' code who have written code in and around it,

Q Which versions of FaceTec software function as described in paragraph 20?

A The enrollment and the authentication would have been built after the -- we had a 3D liveness detection functionality.

Once you're able to do that, then you can enable the storage of that biometric data, which is

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[redacted]

what an enrollment would be, and then the matching of that data to future data or other image data would be a next step. So that would have been something we did very soon after the initial version, but I don't recall an exact version number. But it would have been very, very early on.

Q On what information do you base the statements in paragraph 21 of your declaration?

A "Biometric data" is a very overloaded term. It's used in regulations and laws and things like this, but my understanding -- the way I understand it, the way that I use "biometric data" is essentially data that is of a person. So this could be a part of a person, you know, their face, could be their full body, could be their hand, could be their thumb, could be derivatives of those things.

But the basis for my statement in paragraph 21 is that the data that we capture and analyze at the first distance and at the second distance, creating the first and the second data, includes images of a face and, thus, would include biometric data the way that I personally understand it.

Q So which versions of FaceTec software does the statement in 21 apply?

A That would apply to all versions.

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[redacted]

Q On what information do you base the statement in paragraph 22 of your declaration?

A This is based on my years of experience building 3D liveness detection software where one of the aspects about that is the effect or signal that I'm describing in paragraph 22, that we are able to build software [redacted] to detect this effect and test the -- test to ensure that what we are -- what we are creating is actually performing the functions described here in paragraph 22.

Q What versions of FaceTec software function as described in paragraph 22?

A This would have been a part of signals that all versions of our software were analyzing to determine perspective distortion and three-dimensionality of the user space and the data that's captured at both distances.

Q On what information do you base the statements in paragraph 23 of your declaration?

A This is -- my basis for understanding this is that one of the primary use cases that we've designed our technology for is a user who is holding a handheld device, like a phone or a tablet, and performing this two-distance capture.

So it's something I've been thinking about

[redacted]

for a very, very long time.

Q Which versions of FaceTec software function as described in paragraph 23?

A All versions.

Q On what information do you base the statements in paragraph 24 of your declaration?

A This is based on many years working on solutions to -- working on the problems of 3D liveness checking for users who are using the modality or platform of a laptop or a desktop computer. Many, many years spent thinking about this.

MR. STACH: I have no further questions.

FURTHER EXAMINATION

BY MR. ARJOMAND:

Q Mr. Rose, did you speak with counsel before you gave your redirect testimony?

A No.

Q Mr. Rose, during redirect, you were asked repeatedly about every version of the FaceTec software.

Do you recall that?

A Yes.

Q So we had previously discussed on cross-examination when you thought the first public version of that software was.

Do you recall that?

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A I recall something about that.

Q Do you recall what year you thought that first public version of the software was?

A Can I hear what I recalled?

Q I don't think we can go back and look at your testimony, but my recollection was you thought it was before 2018 because your declaration shows revenues in 2018.

A So what's the question?

Q My question was, do you recall what year you thought the first public version of the FaceTec software was?

A I've also stated that we had been working on creating and releasing versions that contained this core concept of 3D liveness checking since the very beginning, since nearly the very beginning.

So we've put out -- we've released versions since Version 1. Over time, some of them -- the products evolved over time. And I'm not sure when -- which version had our first paying customer.

Before our first paying customer, we certainly had a lot of interested companies and organizations performing testing and initial integrations and giving feedback.

Q So I want to just try to make this easy for

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all of us because it's been a long day.

I'm just trying to pin down for our -- for the sake of asking a series of follow-up questions what you believe was the first -- strike that.

What year do you believe was the year that the FaceTec software product was on sale?

MR. STACH: Objection. Form.

THE WITNESS: I've given you as much perspective as I can think of as far as how we released versions and time periods and how I think about the different versions that we've released.

BY MR. ARJOMAND:

Q Okay. I just want to understand. Your declaration shows revenue in 2018; is that correct? Paragraph 52.

A It shows revenue in 2018, yes.

Q So would it be fair to say that in 2018 FaceTec had a product that was available to the public for sale?

MR. STACH: Objection. Form.

THE WITNESS: We had a product. I'm not sure what you mean by "to the public." But we were getting paid for it. And we definitely had versions prior to 2018. And I believe we had revenue also prior to 2018.

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BY MR. ARJOMAND:

Q Okay. And that product in 2018 was called ZoOm; is that correct?

A So we would have called it the ZoOm SDKs, the ZoOm device SDK, the ZoOm server SDK.

Q So the product that people were paying you in 2018 was called the ZoOm SDK; is that fair?

MR. STACH: Objection. Form.

THE WITNESS: I think I just answered that.

There's different things that the customer that we would have would download. So there's the iOS SDK, the Android SDK, when the browser SDK was developed, the browser SDK. There was a server SDK. These are all different packages.

And we did call -- we called -- say -- we called the product ZoOm in some contexts. We called it the ZoOm SDK in some contexts. We called is the ZoOm SDKs in some contexts.

BY MR. ARJOMAND:

Q Okay. And let's just go for now with ZoOm SDK.

So the product name was ZoOm SDK until sometime during the pandemic where it changed to FaceTec SDK; is that fair?

MR. STACH: Objection. Form.

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THE WITNESS: I gave some prior testimony on this, but, generally, yes, we changed the name sometime during the pandemic to just be FaceTec and the FaceTec SDKs.

BY MR. ARJOMAND:

Q Okay. So let's, just for the sake of a series of questions, assume that the product is called the FaceTec SDK.

Are you with me?

A Okay.

Q All right. So I understand that the name wasn't FaceTec SDK in 2018, but my question is going to use that name. Okay?

So, from 2018 to 2025, FaceTec provides to paying customers the FaceTec SDK; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: I mean, I think there's some qualifiers in there. If they're a -- if they're a customer who was late on their payments or potentially violating our terms and conditions or our contracts, they may have paid us, but they may not have access.

So I guess I'm not understanding the basis for your question.

BY MR. ARJOMAND:

Q I'm just trying to make things go a little

bit smoother, but that's fine. We can just proceed if you're not understanding the question.

So, in paragraph 52 of your declaration, you have the years 2018 through 2024 for revenue, right? That's listing the revenue each year for FaceTec, correct?

A Yes.

Q And in your opinion, the revenue that's listed in paragraph 52 for years 2018 to 2024 is associated with the FaceTec SDK; is that correct?

A I believe all of this revenue would be from customers who are using the FaceTec SDKs and performing 3D liveness checks.

Q Okay. So I believe you testified that every version of the FaceTec SDK from 2018 to 2024 had a determination that the user's face is three-dimensional when the first data does not match the second data and the second data has the expected differences as compared to the first data that should be present as a result of the change in distance between the user and the camera when capturing the first image and the second image; is that correct?

MR. STACH: Objection. Form.

THE WITNESS: I said all versions, not all versions between 2018 and 2024.

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BY MR. ARJOMAND:

Q Can you explain?

A As I've clarified earlier, we had versions of our software since nearly the very beginning and before we had revenue.

Q Okay. But certainly the versions between 2018 to 2024 had what I just recited with respect to paragraph 18 of your declaration; is that correct?

A Yes. I believe so.

Q Okay. And you had previously testified that -- that the FaceTec SDK extracts a signal for a perspective distortion from the data that is captured from the user utilizing the FaceTec SDK.

MR. STACH: Objection. Form.

THE WITNESS: Is that a question?

BY MR. ARJOMAND:

Q Yes.

A I'm not sure. Were you quoting me?

Q I believe that's what you testified previously, but I may be wrong.

Do you recall testifying that once the 3D face scan is received by the server SDK, the server SDK extracts a signal for perspective distortion?

Do you recall that?

A I don't think I said it in that way.

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[redacted]

Q Is that not accurate, the question that I just asked?

Let me ask it this way: Does -- once the 3D face scan is received by the server SDK, does the server SDK extract a signal for perspective distortion?

MR. STACH: Objection. Form.

THE WITNESS: One of the things the FaceTec server SDK does when it decrypts the face scan, unpacks it, is we have this rich data that's available to us to analyze and process and extract signals from. And one of those signals would be analysis of perspective distortion and the expected perspective distortion, which factors into a notion of a 3Dness of the face, [redacted], and the execution of other security layers that eventually go into the final decision.

BY MR. ARJOMAND:

Q Does every version of the FaceTec server SDK from 2018 to 2024 decrypt a face scan, unpack it, process and extract signals from that data, including signals related to perspective distortion, [redacted], and the execution of other security layers that eventually go into the final decision?

MR. STACH: Objection. Form.

THE WITNESS: Sorry. Did you say every

[redacted]

version of?

BY MR. ARJOMAND:

Q Let me break down that question if it's a little too much for you.

Does every version of the FaceTec server SDK from 2018 to 2024 decrypt a face scan, unpack it, and process and extract signals from the data, including a signal related to perspective distortion?

A We definitely always analyzed signals related to perspective distortion, but there was a point in time where FaceTec didn't have a server SDK. And I'm not sure what time period that was, so you're asking about 2018 to --

Q 2024, Mr. Rose.

A So I gave you an answer on the perspective distortion part.

What was the other part of the question?

Q I don't think you gave me an answer, Mr. Rose, with all due respect.

If I -- I'll ask you the question again, but I won't limit it to the FaceTec server SDK. Just referring to a FaceTec SDK, which could either be the ZoOm product or it could be the current product that includes both the FaceTec device SDK and the FaceTec server SDK.

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[redacted]

Do you understand my question?

Do you understand how I'm laying this out for you?

A Yes.

Q Okay. So I'm asking you, does every version of the FaceTec SDK from 2018 to 2024 decrypt a face scan, unpack it, process and extract signals from the data, including a signal related to perspective distortion?

MR. STACH: Objection. Form.

THE WITNESS: Every version has done the extraction of signal from the data captured at two distances for the purposes of ensuring expected differences in the perspective distortion and other distortions in deriving a 3D signal.

[redacted]

[redacted]

1 [redacted]

[redacted]

3 BY MR. ARJOMAND:

4 [redacted]

[redacted]

6 MR. STACH: Objection. Form.

7 MR. ARJOMAND: Strike that.

8 BY MR. ARJOMAND:

9 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1 THE WITNESS: Yes. I believe so.

2 BY MR. ARJOMAND:

3

14 MR. STACH: Objection. Form.

15

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BY MR. ARJOMAND:

Q You testified there was a point in time where FaceTec didn't have a server SDK.

When was that, Mr. Rose?

A Early on when we first started development.

Q So before 2018?

A Possibly still in 2018. I'm not sure though.

Q How about 2019, Mr. Rose?

MR. STACH: Objection. Form.

THE WITNESS: Are you asking if we had a server SDK?

BY MR. ARJOMAND:

Q In 2019.

A We definitely would have moved to having a server SDK by 2019.

Q Mr. Rose, let me direct you to paragraph 16 of your declaration.

Do you recall counsel asking you about this paragraph on redirect?

A Yes.

Q Mr. Rose, which versions of FaceTec software function as described in paragraph 17?

A 17 or 16?

Q Strike that.

Yeah. Which versions of FaceTec software

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[redacted]

1 function as described in paragraph 16?

2 [redacted]

12 So we focused on what we believed to be the

13 strongest signal first, which was the perspective

14 distortion, the 3D extraction -- 3D signal extraction,

15 detection of other kinds of face distortions.

16 But we -- we began to utilize signals like

17 this right around the time when we started having a

18 server SDK as a part of our product.

19 Q So that would be around 2019; is that right,

20 Mr. Rose?

21 A So I believe Jumio never used our

22 on-device-only product. And they were licensing our

23 software from November 18th. So I think we had to have

24 a -- had to have had a server SDK by then. So it was

25 around -- around this time, 2018, 2019.

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[redacted]

Q So you just testified that "We focused," quote, "on what we believed to the strongest signal first, which was the perspective distortion, the 3D extraction -- 3D extraction and detection of other kinds of face distortions"; is that correct?

A I said something like that. I'm not sure if that's a quote or not, but . . .

Q Is there a difference between the signal with respect to perspective distortion and the 3D signal extraction?

MR. STACH: Objection. Form.

THE WITNESS: Perspective distortion allows us to infer -- the analysis of perspective distortion allows us to infer the three- dimensionality of the face that's being scanned, whether that's a real user or a spoof. It's one of the signals that is apparent in the data from the two-distance capture that we extract to ensure has the expected amount of changes so that we can infer that not only is a 3D object but that it's specifically a three-dimensional face that we're looking at.

So it has to have the expected amount of perspective distortion changes, other types of changes for us to make that assessment of three-dimensionality.

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BY MR. ARJOMAND:

Q And I believe you testified about this previously, but I want to ask you one more time since you raised it.

You say that -- strike that.

What other signals are apparent in the data from the two-distance capture that you extract, Mr. Rose?

MR. STACH: Objection. Form.

THE WITNESS: I think I gave a lot of information about this in previous responses.

Are you asking me to -- the same question?

BY MR. ARJOMAND:

Q Yes.

MR. STACH: Objection. Form.

THE WITNESS: Can we refer to my previous testimony on this?

BY MR. ARJOMAND:

Q I don't think that's possible, Mr. Rose.

MR. STACH: We have a transcript. It is possible.

BY MR. ARJOMAND:

Q As you sit here now, what other signals are apparent from the data that's captured at two distances that you ultimately extract?

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MR. STACH: Objection. Form.

THE WITNESS: Can we take a look at my previous response?

BY MR. ARJOMAND:

Q I asked as you sit here now.

MR. STACH: Objection. Outside the scope of redirect.

THE WITNESS: I already answered this question earlier and a variety of similar questions, but I'd be happy to answer a more specific question.

BY MR. ARJOMAND:

Q I appreciate that, Mr. Rose.

Let me just shift you back to your declaration at paragraph 20.

You were asked about this paragraph on redirect, correct, Mr. Rose?

A Yes.

Q It says that the FaceTec software will only authenticate the user when the first data and the second data are both matching the enrollment data within a predetermined threshold.

Do you see that?

MR. STACH: Objection. Foundation. Form.

MR. ARJOMAND: I can read the entire sentence into the record if you'd like, Mr. Stach, but --

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MR. STACH: It's my understanding you said "only" instead of "optionally."

BY MR. ARJOMAND:

Q Well, because the sentence says "only authenticate," but I'll read the entire sentence in the record so it's clear.

"The FaceTec software will optionally compare the first data, second data, or both to enrollment data and only authenticate the user when the first data, second data, or both match the enrollment data within a predetermined threshold."

Do you see that?

A I see what is written in paragraph 20.

Q Okay. And does that paragraph cover the feature of 3D face match that has been previously obtained being compared to a new 3D face match?

MR. STACH: Objection. Form.

THE WITNESS: That question does not make any sense to me.

BY MR. ARJOMAND:

Q What feature does paragraph 20 -- strike that.

Paragraph 20 is directed to what feature, Mr. Rose?

MR. STACH: Objection. Form.

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[redacted]

THE WITNESS: Do we have an Exhibit 2068?

BY MR. ARJOMAND:

Q Yes, we do (handing document).

A Thank you.

Yeah. So this refers to when there's enrollment data. So that would be a 3D liveness check that was performed where 3D liveness was proven compared to or taking that data and using algorithms to match that data. And the data being the first data at the far distance and the second data at the close distance. So this would refer to the 3D:3D matching feature?

And I'll note that prior to us having a FaceTec server component to the solution, we had this functionality, even though there was not a concept of a 3D face scan that was sent up to the server. So this type of operation would have happened locally on the device in that case.

Q So, Mr. Rose, counsel walked you through paragraphs 11 through 24 of your declaration on redirect; is that correct?

A I think so, yeah.

Q And is it correct that, other than paragraph 20 that we were just discussing, every one of those paragraphs from 11 through 24 cites Exhibit 2067?

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A That appears to be correct.

Q So, other than paragraph 20, you relied on Exhibit 2067 for paragraphs 11 through 24; is that correct, Mr. Rose?

MR. STACH: Objection. Form. Foundation.

THE WITNESS: I'm not sure what you mean by "relied on." I think the statements I'm making in my declaration, many of the statements stand on their own without the exhibit but . . .

BY MR. ARJOMAND:

Q So why did you cite Exhibit 2067 for paragraphs 11 through 24, other than paragraph 20, Mr. Rose?

A As we went through earlier, I think there are aspects of Exhibit 2067 that are helpful in understanding some of the points of discussion in the paragraphs that you're referencing.

MR. ARJOMAND: Okay. No further questions.

MR. STACH: Nothing further from me either.

(TIME NOTED: 7:13 P.M.)

REPORTER'S CERTIFICATION

I, Leslie Johnson, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were administered an oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; that the foregoing transcript is a true record of the testimony given.

Further, that if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript [ ] was [x] was not requested.

I further certify I am neither financially interested in the action nor a relative or employee of any attorney or any party to this action.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: January 15, 2025

Leslie Johnson

LESLIE JOHNSON, CSR No. 11451, RPR, CCRR

MEHRAN ARJOMAND, ESQ.
marjomand@mofo.com

January 16, 2026

RE: Jumio Corporation v. Facetec
1/15/2026, Joshua Rose, (#7811282).
The above-referenced transcript has been
completed by Veritext Legal Solutions and
review of the transcript is being handled as follows:

__ Per CA State Code (CCP 2025.520 (a)-(e)) – Contact Veritext to schedule a time to review the original transcript at a Veritext office.

__ Per CA State Code (CCP 2025.520 (a)-(e)) – Locked .PDF Transcript - The witness should review the transcript and make any necessary corrections on the errata pages included below, notating the page and line number of the corrections. The witness should then sign and date the errata and penalty of perjury pages and return the completed pages to all appearing counsel within the period of time determined at the deposition or provided by the Code of Civil Procedure. Contact Veritext when the sealed original is required.

__ Waiving the CA Code of Civil Procedure per Stipulation of Counsel - Original transcript to be released for signature as determined at the deposition.

__ Signature Waived – Reading & Signature was waived at the time of the deposition.

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xx Federal R&S Not Requested - Reading & Signature was not requested before the completion of the deposition.