

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner

v.

AUTONOMOUS DEVICES, LLC,

Patent Owner.

Case: IPR2023-01055

U.S. Patent No. 11,238,344

REMOTE DEPOSITION OF

ELI SABER, PH.D.

9:58 a.m.

Reported By:

Randi J. Garcia, RPR

DIGITAL EVIDENCE GROUP

1730 M Street, NW, Suite 812

Washington, D.C. 20036

(202) 232-0646

1

2

3

Transcript of the deposition of

4

ELI SABER, Ph.D., called for Oral Examination

5

in the above-captioned matter, said

6

Deposition being taken pursuant to Federal

7

Rules of Civil Procedure by and before RANDI

8

J. GARCIA, Registered Professional Reporter,

9

via Zoom, on Friday, June 14, 2024,

10

commencing at approximately 9:58 a.m.

11

12

13

14

15

16

17

18

19

20

21

22

1 A P P E A R A N C E S:

2 ON BEHALF OF PETITIONER.

3 By: Matthew Colvin, Esq.

4 Fish & Richardson P.C.

5 1717 Main Street, Suite 5000,

6 Dallas, TX 75201

7 colvin@fr.com

8 and...

9 By: Gretchen A. DeVries, Ph.D.

10 Fish & Richardson P.C

11 7 Times Square, 20th Floor,

12 New York, NY 10036

13 devries@fr.com

14

15 ON BEHALF OF PATENT OWNER:

16 By: Arvind Jairam, Esq.

17 McKool Smith

18 1999 K Street, NW

19 Washington, DC 20006

20 ajairam@mckoolsmith.com

21

22

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

I N D E X

WITNESS: ELI SABER Ph.D.

EXAMINATION

PAGE

By Mr. Colvin: 6

* * *

1

INDEX TO EXHIBITS

2

3

EXHIBIT

DESCRIPTION

PAGE

4

5

Exhibit 2007 Declaration

10

6

Exhibit 1005 Thomas patent

10

7

Exhibit 1006 Bueller patent

10

8

Exhibit 1001 '134 patent

98

9

10

11

12

13

14

15

16

17

18

19

20

21

22

Page 6

1 E L I S A B E R, Ph.D., after having been
2 first duly sworn, was examined and testified
3 as follows:

4 EXAMINATION

5 BY MR. COLVIN:

6 Q. Okay. Good morning, Dr. Saber.

7 A. Good morning, Mr. Colvin. How are
8 you?

9 Q. I'm doing fine.

10 We haven't met before, but my name is
11 Matt Colvin. I'm attorney for Tesla in this
12 matter and I'm going to be asking you some
13 questions today.

14 A. It's my privilege and pleasure to
15 meet you, sir.

16 Q. I know you've done quite a few of
17 these, but let me go over some ground rules,
18 nevertheless.

19 Any reason you can't tell the truth
20 today, sir?

21 A. No.

22 Q. Are you alone in the room?

1 A. I am.

2 Q. Okay. And where are you physically?

3 A. I'm in my home office.

4 Q. And do you have any way to
5 communicate with counsel today during this
6 deposition, such as text messages or chat or
7 anything like that?

8 A. No, I do not.

9 Q. Okay. And do you have a copy of your
10 declaration and the associated exhibits with
11 you?

12 A. I do, but I also would like you to
13 upload electronic copy.

14 Q. Okay. Do you have hard copies or
15 electronic copies yourself?

16 A. I have the hard copy that counsel has
17 sent in a three ring binder, but I prefer to
18 use electronic copy.

19 Q. Okay. And does the copy you have
20 have any notes on it?

21 A. No, it does not.

22 Q. Okay. Do you have any other notes

1 accessible to you for this deposition?

2 A. No, I do not.

3 Q. Okay. We're doing this remotely
4 today, so there's certainly a chance of some
5 technical difficulties. If those come up, just
6 bear with us okay, sir?

7 A. Absolutely.

8 Q. I also have a separate monitor over
9 here, and sometimes I will just turn my head
10 and look at the monitor while I'm asking
11 questions and my sound will drop off. If that
12 happens and you can't hear or understand the
13 question, just let me know, okay?

14 A. Absolutely.

15 Q. And we're going to have to be mindful
16 not to talk over one another today. And so I'd
17 just ask that you let me finish my question
18 before you start answering, and I will
19 certainly try to let you finish your answer
20 before I start asking a question. Sometimes
21 with pauses and answers, that can get a little
22 difficult, but just let me know if you haven't

1 finished and I'll let you finish your answer
2 okay, sir?

3 A. Thank you.

4 Q. Okay. We typically go about an hour,
5 maybe a little more, maybe a little less,
6 between breaks, but if you need to take a
7 break, go to the restroom or refill your
8 coffee, just let me know and we'll do that. I
9 just ask that if there's a question pending,
10 that you fully answer the question before we
11 take a break, okay?

12 A. Absolutely.

13 Q. Okay. And you understand that you're
14 under oath today and that's just like you would
15 be if you were in a courtroom in front of a
16 judge or a jury; right?

17 A. I do.

18 Q. And an oath requires you to tell the
19 truth. You're going to do that today; right,
20 sir?

21 A. I will.

22 Q. Okay. I am going to attempt to put

1 in some exhibits into the chat.

2 A. That would be terrific.

3 (Thereupon, Exhibit 2007 was marked for
4 identification.)

5 BY MR. COLVIN:

6 Q. Okay. The first exhibit I'm going to
7 drop into the chat is your declaration. This
8 is Exhibit 2007.

9 A. Okay. Let me know once you drop it.

10 Q. My computer is working on it. I've
11 got an hourglass that could indicate some
12 problem, but we'll see.

13 A. We can always stop any time you want.

14 Q. Yeah. It's all right. We've got
15 plenty of time on the record.

16 A. I haven't seen anything on my end.

17 Q. Yeah. Nor should you. My File
18 Explorer shut down and I'm trying to bring it
19 back up.

20 (Thereupon, Exhibit 1005 was marked for
21 identification.)

22 (Thereupon, Exhibit 1006 was marked for

1 identification.)

2 BY MR. COLVIN:

3 Q. Do you have a copy of your
4 declaration? Do you also have a copy of Thomas
5 and Buehler?

6 A. I do.

7 Q. Where Thomas is Tesla Exhibit 1005
8 and Buehler is Exhibit 1006?

9 A. I do.

10 Q. Okay. I'm going to press forward.
11 File Explorer is not working. Let me work on
12 it during a break, but I'm not going to
13 continue wasting your time here.

14 So let's talk about Thomas. Thomas
15 describes a learning mode and a simulation
16 mode; right?

17 A. Yes, generally speaking, yes.

18 Q. Well, I mean, not generally speaking.
19 It does describe a learning mode and a
20 simulation mode; right?

21 A. That is correct.

22 Q. And in the learning mode, it records

1 inputs in response to events; is that fair?

2 A. Are you going to upload a copy of
3 Thomas?

4 Q. I'm not able to upload a copy right
5 now, but you have a hard copy of it, you can
6 look at it for sure.

7 A. What was your question, sir?

8 Q. That as part of the learning mode it
9 records inputs in response to events that it
10 detects; right?

11 A. Give me one moment.

12 So if you look at the abstract --
13 sorry. Yeah. If you look at the abstract of
14 Thomas, and I'm looking like in, I don't know,
15 third of the way down, "During the learning
16 mode, the simulator is configured to monitor
17 the user's interaction with a computer program
18 for one or more events and analyze one or more
19 current circumstances during the occurrence of
20 one or more events."

21 That's right in the abstract of
22 Thomas.

1 Q. Right. And you would agree that
2 the -- that Thomas discloses that during a
3 learning mode that it records inputs in
4 response to those events; right?

5 A. Well, it's monitoring the user
6 interaction with a computer program, so
7 obviously -- so it would be recording inputs.

8 Q. And specifically it records inputs in
9 response to events; right?

10 A. Well, as it states, the simulator is
11 configured to monitor the user's interaction,
12 so there's an interaction with the computer
13 program for one or more events and analyze one
14 or more current circumstances during the
15 occurrence of the one or more events.

16 MR. JAIRAM: Matt, is it okay if I
17 upload electronic copies? I think you
18 mentioned you have some technical
19 difficulty. I just want to make sure he's
20 able to see it in the format he asked for.
21 Do you mind if I upload it?

22 MR. COLVIN: I think we're fine as we

1 are now.

2 BY MR. COLVIN:

3 Q. So the --

4 THE WITNESS: I prefer to have
5 electronic copy because it's just easier
6 to find something in it.

7 BY MR. COLVIN:

8 Q. Is that right?

9 MR. COLVIN: Yeah, you know what, I
10 don't care. Go for it. Upload -- if you
11 have them, Arvind, you can upload Thomas,
12 if you have it.

13 MR. JAIRAM: Okay. I'm going to
14 upload it now.

15 THE WITNESS: I have clicked upload.
16 It should show up.

17 MR. COLVIN: Yeah. I see it on my
18 end.

19 THE WITNESS: I am -- I see it. I am
20 downloading it now.

21 Arvind, would you please upload a
22 copy of my declaration as well.

1 MR. COLVIN: Yeah. That's fine. Go
2 for it, Arvind.

3 MR. JAIRAM: Okay.

4 THE WITNESS: And since we'll be
5 talking about Buehler, maybe Buehler at
6 the same time.

7 MR. COLVIN: Yeah.

8 MR. JAIRAM: They should all be in
9 the chat.

10 MR. COLVIN: Let me know when you
11 have them downloaded, sir, and I'll
12 continue with my questions.

13 THE WITNESS: So I have the three
14 files downloaded. And I have Thomas open.

15 MR. COLVIN: Okay.

16 BY MR. COLVIN:

17 Q. So I'm going to ask the question that
18 I believe I asked when this was -- before we
19 kind of got derailed with these exhibits, just
20 to get the record back on track.

21 You agree that Thomas, in the
22 learning mode, records inputs in response to

1 events; right?

2 A. Well, as I mentioned to you in the
3 abstract -- so during learning mode, the
4 simulator is configured to monitor the user's
5 interactions with the computer programs. So
6 the user's interaction with the computer
7 program, so there's inputs there, interaction
8 with the computer program, for one or more
9 events, and analyze one or more current
10 circumstances during the occurrence of those
11 events.

12 So it records the inputs, the
13 interactions of the users, and responds to
14 those events.

15 Q. And it stores those inputs in data
16 fields; right?

17 A. What do you mean by data fields?
18 There is a data structure in Thomas.

19 Q. Well, I'm using data fields as Thomas
20 uses data fields, sir. Thomas stores those
21 inputs in data fields; right?

22 A. Which portion of Thomas are you

1 referring to, so we can be accurate for the
2 record?

3 Q. Oh, I'm just referring to Thomas'
4 learning mode in general.

5 A. Okay. So Thomas is -- utilizes data
6 structures. So if you look at the summary of
7 the invention, I think Thomas captures that.
8 I'm looking at column 2, lines roughly 33. So
9 Thomas states that, "The simulator is further
10 configured to record one or more user inputs in
11 response to the occurrence of one or more
12 events" -- so it's recording user inputs
13 response to events -- "store the one or more
14 user inputs in one or more data fields, and
15 associates the one or more data fields with the
16 one or more events and the one or more current
17 circumstances."

18 So that's on column 2 starting at
19 line 29 to 34.

20 Q. And you understand that, sir?

21 A. I do.

22 Q. What does it mean for Thomas to

1 associate the data fields with events and
2 circumstances?

3 A. It associates them. It associates
4 the data field just like it says, it associates
5 them, makes an association between the data
6 fields and the event.

7 Q. What is an association in this
8 context?

9 A. Well, you have a data field and you
10 have an event. It's just going to basically
11 provide an association. It's just going to say
12 this data field and these events are associated
13 together, so when you find this event, you have
14 basically visibility to these data fields and
15 vice versa.

16 Q. And why does it make an association
17 between the data fields and the events and
18 circumstances?

19 A. Well, it's kind of like having a
20 pointer, in a sense, you have a data field that
21 you want to be able to associate with an event
22 so when that event occurs you can reference

1 that data field and back and forth.

2 Q. So when an event occurs, you want to
3 be able to reference the inputs associated with
4 that event and the circumstances associated
5 with that event?

6 A. Well, just what it's saying you have
7 inputs and responses to occurrences of the one
8 or more events. So there's an occurrence of an
9 event. There's an input by the user -- excuse
10 me, a response to that occurrence, stores the
11 one or more inputs and one or more data fields,
12 because you might have provided more than one
13 input. Move left, move right, whatever, and
14 associate the one or more input or data fields
15 with the one or more events so that when that
16 event may pop up down the road, you can
17 reference those data fields.

18 Q. And what about circumstances? So it
19 says events and circumstances are associated
20 with the data field. Why would the -- why
21 would the circumstances be associated with the
22 data field?

1 A. So that you can react to when you see
2 the event. I have a player running down the
3 sideline, and there's two minutes on the clock.
4 I can, you know, react, the computer can react
5 to this particular situation.

6 Is this something in reference to
7 somewhere in my declaration are you asking
8 questions about?

9 Q. Well, I mean, obviously Thomas is a
10 reference, and so I'm just trying to get kind
11 of a baseline understanding of your
12 understanding of Thomas, so that what's
13 happening here.

14 A. I mean, my opinions are in my
15 declaration, so I'm curious as to which part of
16 my declaration are you referencing so we can be
17 specific and clear about it?

18 Q. Okay. And can you give me some
19 examples of events that would trigger the
20 storage of inputs into data fields in Thomas?

21 A. Thomas provides that.

22 Q. You referenced a player like running

1 down the sideline, would that be an example of
2 an event?

3 A. Well, let's look at column 4 of
4 Thomas.

5 Q. Okay.

6 A. So if you look at column 4 of Thomas,
7 you see it talks about an examples -- I'm at
8 column 4, I'm starting at line 13, just to give
9 you the context --

10 Q. Okay.

11 A. -- of it.

12 You see Thomas is talking about
13 Figure 4 there, it's talking about example
14 structure of user profile 650, which is shown
15 in Figure 4 of Thomas, so you can see the user
16 profile in Figure 4 and there's like a -- kind
17 of a block diagram with events and then time
18 and et cetera.

19 And it describes the user profile
20 that contains sub profiles related to the one
21 or more events. Now it has a misnumbering
22 here, because it -- then the figure, it numbers

1 it 655, but in the patent it says 685 for
2 events. So there's a typo there.

3 And then if you look at line 16, it
4 describes, "An event is a particular action
5 occurring, whereas a situation is the
6 surrounding circumstances during which an event
7 may take place." Now, it gives an example,
8 just as you asked, about this whole situation.

9 If you look, it says, "For example,
10 in a football game, a situation may be how much
11 time is left in a game" -- you have two minutes
12 left, whatever -- "or the position of the
13 players on the football field, whereas an event
14 may be the quarterback throwing a long bomb" --
15 or Hail Mary -- "or the running back breaking a
16 tackle." So that's as good as of an example as
17 you can get from Thomas.

18 Q. Okay. So taking that example where
19 the event is the quarterback throwing a long
20 bomb or the running back breaking a tackle, the
21 circumstance could be something like time on
22 the clock; is that right?

1 A. So you see it says a situation,
2 "whereas a situation is the surrounding
3 circumstances during which an event." I'm on
4 line 19, 20 of that same column. So you can
5 see the situation is the surrounding
6 circumstances during which an event may take
7 place. So it's the surrounding circumstances
8 of that event.

9 And then it gives the example in a
10 football game. The situation may be how much
11 time is left in the game. Show you how much
12 time is left in the game, you have -- or a
13 position of the players on the football field.
14 So that's a situation. Maybe the players are
15 blitzing or whatever, there's a situation
16 there.

17 Whereas, the event may be the
18 quarterback throwing a long bomb -- probably
19 should have called it a Hail Mary, but ... so
20 you have a long bomb a basically long pass
21 thrown by the quarter back it could be in
22 desperation or whatever or you have a running

1 back breaking a, you know, an important tackle
2 or something.

3 Q. So in Thomas in the learning mode,
4 the event is something like throwing a long
5 bomb and the circumstance could include time on
6 the clock, position of the players, maybe
7 somebody's blitzing, maybe somebody is wide
8 open down the field --

9 A. Right.

10 Q. -- something like that, right?

11 A. Right. The surrounding circumstance
12 of the event. What's happening on the field
13 when the event, you know -- or -- is occurring
14 or for the event to occur.

15 Q. And just for the transcript, your
16 answer there was -- was right, before you gave
17 your answer. It just got cut off because we
18 talked over one another. Is that right? Is
19 that correct? Let me ask it again. This is
20 completely muddled. I'm sorry.

21 I'm just going to ask my question I
22 just asked, so sorry for being repetitive.

1 So in Thomas, in the learning mode,
2 the event is something like throwing a long
3 bomb and the circumstance could include time on
4 the clock, position of the players, maybe
5 someone blitzing, maybe someone is wide open
6 down the field; right?

7 A. That is correct. That's what Thomas
8 states.

9 Q. So let's talk about Thomas' data
10 fields. I want to understand how this system
11 of Thomas would work in practice. And I
12 apologize that I'm just a lowly mechanical
13 engineer, so sometimes these data structures
14 are a bit over my head and I may use some wrong
15 technology, but I think we can get there.

16 A. I'm sure you're well versed in these
17 situations.

18 Q. So I'm envisioning a data --
19 something like a database that has in one
20 column, events, in a second column, inputs, a
21 third column, circumstances. Is that -- is
22 that on the right track of what this data

1 structure of Thomas could look like?

2 A. Well, it's probably not quite in the
3 column structure you -- you proposed. But you
4 have basically a data structure. I mean, you
5 can almost see like -- if you look at Thomas --
6 if you look at Thomas starting at column 13 at
7 the bottom and going into column 19, you can
8 see, like you have a user profile and there is,
9 you know, a whole bunch of things are defined
10 there, you know, doDiveTackle, this, that, use
11 this playbook. So he's got a bunch of -- and
12 essentially let's call them variables -- that
13 are being defined and -- in that particular
14 data structure of Thomas in this user profile.

15 Q. And would you say that's what's shown
16 in the left-hand columns here -- so, for
17 example, I'll just look at column 13 about
18 line 63. Just the first one that's listed just
19 for the ease of reference.

20 A. Yes.

21 Q. So it says "doDiveTackle" in the
22 left-hand column of the table.

1 Do you see that?

2 A. Yes.

3 Q. Would that be an example of an event?

4 A. Well, it would be -- you know, like
5 some of these might be events, some of these
6 might be responses to events. Like if you
7 look, for instance, "doDiveTackle" may be a
8 response to a running back, you know, going up
9 the middle or something.

10 You know, for instance, if you look
11 at column 14, line 33, see it says "pumpFake."
12 Right. That could be potentially an event
13 where the quarterback, you know, throws away --
14 a pass thrown away or pump fake or something.
15 So some of them are responses in a sense to
16 events.

17 Q. Okay. So let me take a step back
18 then and get a little higher level. Back to my
19 original question of how this data is
20 organized.

21 I kind of described it as a -- what I
22 would think of as a database with columns, and

1 you pushed back on that a little bit. So I'll
2 just ask to you open-endedly.

3 How is Thomas' data stored in data
4 structures?

5 A. Well, Thomas doesn't provide an exact
6 description of the storage, just Thomas says
7 that a data structure -- like, for instance, if
8 you look at column 3, he's got a couple of
9 figures. See Figure 6 and Figure 7, which he
10 refers to as data structures.

11 You see there's a -- Figure 6 is --
12 is labeled as a data structure in accordance
13 with the preferred embodiment of the present
14 invention. And what you see there is
15 essentially user profile with all these pieces
16 underneath it.

17 And then in Figure 7 you see it --
18 Thomas states it's a data structure in
19 accordance with the preferred embodiment of the
20 present invention. If you look at that data
21 structure in Figure 7, what you note is, is it
22 says playbook profile, and it's labeled 500.

1 Do you see that?

2 Q. I do.

3 A. And when you look at the labeling
4 500, and you look at the previous figure, you
5 see on the right side of Figure 6 half -- in
6 the middle right, far right on Figure 6, do you
7 see where it says "playbook profile" and the
8 label is 500?

9 Q. I do.

10 A. So that's essentially a blowup of
11 that profile shown in Figure 7. So this
12 playbook profile shown in Figure 6 is blown up
13 and shown in Figure 7 for you so you can see,
14 like, offensive situation profile one and
15 whatever defensive situation profile one, et
16 cetera. It's kind of like a -- it's -- he's
17 giving you the logical, in a sense, the block
18 diagram to describe the data structure. He's
19 not giving you like the C programming exactly
20 how he has programmed this.

21 Q. Okay. So we don't really know, in
22 Thomas, exactly how the data is physically

1 structured, but we do know that inputs are
2 stored in data fields and those data fields are
3 associated with events and circumstances?

4 A. As I stated earlier from Thomas.

5 Q. Yes.

6 Why do you think Thomas calls it a
7 learning mode? What's -- yeah, I'll leave it
8 there.

9 A. I mean, again, I'm -- I mean, we're
10 going on to these questions. Is there
11 something in the reference to my declaration
12 that -- my opinions are in my declaration.

13 Is there something in reference to my
14 declaration that you're asking about?

15 Q. No.

16 MR. JAIRAM: Objection. Scope.

17 Q. My question still stands, sir. Why
18 does Thomas call it a learning mode?

19 MR. JAIRAM: Objection. Scope.

20 Objection. Form.

21 THE WITNESS: So if you look at
22 column 4 of Thomas, I'm on line 5, and

1 this is turning to Figure 3A and 3B of
2 Thomas. So Thomas is describing basically
3 what's going on in these figures. So you
4 see where it says "during learning mode
5 550," and it's referencing Figure A box
6 "retrieve user profile" 550 --

7 BY MR. COLVIN:

8 Q. Yes.

9 A. -- shown in Figure 3A?

10 The simulator 120, which was shown
11 back in Figure 1. So if you go back to
12 Figure 1 and look, you can see a computer
13 program -- a simulator 120 and a database 130,
14 so he's talking about the 120 -- records a
15 user's input as the user's interacting with the
16 game.

17 Q. Why does Thomas record the user's
18 input when interacting with the game? What's
19 the purpose of that?

20 A. So if you look at that same column 4,
21 you see Thomas describes -- going on, he gives
22 example structure and that example that I just

1 gave you. And you see he goes down to the
2 bottom of column 4, it says "during operation."
3 You see that on line 60?

4 Q. I do.

5 A. "The simulator 120 retrieves, creates
6 or establishes a user profile for a particular
7 user interacting with the computer program."
8 So now you're in operation mode, like in your
9 simulation mode, in a sense. So it retrieves
10 the profile that it has learned in the learning
11 mode.

12 And then you see the next sentence on
13 line 62, it says, "The simulator 120 monitors
14 and analyzes the user's interaction with the
15 program. If the simulator identifies a
16 particular situation and/or event occurring,
17 defined by parameters such as those above."

18 So where it has learned, you know,
19 for a pump fake, do this, right? Then the
20 simulator will record the user's decision and
21 then continues on.

22 Q. Okay. So after the system in Thomas

1 learned how a user behaves in a certain
2 situation in response to certain circumstances
3 it then uses what it learned to control avatars
4 in a simulation.

5 You agree with that?

6 A. Can you repeat the question, please.

7 Q. Yeah. Sorry, it was slow. I was
8 thinking of it as I was speaking.

9 A. I lost part of it, yes.

10 Q. So after the system in Thomas learns
11 how a user behaves in certain situations in
12 response to certain circumstances, it then
13 takes what it learned and uses that to control
14 avatars in a simulation; is that right?

15 A. Generally speaking, that's correct.

16 Q. Okay. So let's talk about what
17 happens in this playback or this simulation
18 mode for a bit, okay?

19 A. Again, is this something in reference
20 to something in my declaration? I mean, my
21 opinions are on my declaration. Are you
22 referencing something specific in my

1 declaration?

2 Q. I'm referencing Thomas, sir.

3 A. But with -- you know, Thomas is
4 obviously discussed in my declaration in
5 response to certain claims and certain claim
6 elements. Is there something specific that
7 you're referencing in my declaration?

8 Q. No. We're just talking about Thomas
9 generally first.

10 So in simulation mode, the system of
11 Thomas monitors what's going on, monitors the
12 program for events; right?

13 A. Well, I mean, let's look at an
14 example. So if you look, for instance, on --
15 let's look at column 5 starting at line 50,
16 because I'm fairly familiar with the game of
17 football and I'm not so familiar with
18 basketball or baseball.

19 Q. That's fair.

20 A. I don't even like some of -- so I'm
21 very familiar with the game football because
22 I've coached it with my kids for several years.

1 So you see where it says there on
2 line 50 on column 5, you see where it says, "If
3 the time left on the play clock is less than
4 two minutes". So this is obviously in
5 discussion -- if you look at the context above
6 it starting at line 30, it says, "During
7 simulation or playback mode as shown in Figure
8 3B."

9 So this is discussing simulation or
10 playback mode where the computer is going to do
11 something. So you see there it says if the
12 time left on the play clock is less than two
13 minutes and simulated user -- so here's your
14 avatar -- simulated user is losing by five
15 points -- right, so you have a simulated user,
16 that's perhaps me, which I have a bunch of
17 avatars there, and I'm losing by five points,
18 then the simulator 120 will analyze the
19 situation to determine whether the user would
20 kick a field goal or try to reach the end zone
21 for a touchdown.

22 This actual situation happened in

1 real life in one of my football games, but
2 let's not go there.

3 So you're losing by five points. You
4 know the field goal is worth three points. You
5 have only two minutes left on the clock. So if
6 you kick the field goal, you get three points,
7 but your chances of getting the ball back are
8 probably slim to none, because the other side
9 is going to probably do a victory salute.

10 So that's the point here. See, the
11 time left on the clock is less than two
12 minutes, you have a certain circumstance, you
13 have a simulated user that's losing by
14 five-points, simulator will analyze such a
15 situation to determine whether the user would
16 kick a field goal or try to reach end zone for
17 a touchdown.

18 Q. So I appreciate all of that answer,
19 sir. And I'm following you, but I don't think
20 you answered my question. Let me ask it again.

21 A. Okay.

22 Q. In simulation mode in Thomas the

1 system monitors what's going on. It -- it
2 monitors the program for events; right?

3 A. Well, it's monitoring obviously --
4 it's monitoring the situation and it's going to
5 respond with an event.

6 Q. Well, are you sure about that, sir?
7 Are you sure in simulation mode that Thomas
8 isn't monitoring for events?

9 A. Look at the next sentence there
10 starting at line -- it's column 5 and I'm still
11 at line 54 now. You see it says -- so we have
12 a situation as a good example. You have time
13 left on the play clock, you have two -- less
14 than two minutes, you have a simulated user,
15 me, losing by five points, then the
16 simulator -- so right now you have a situation,
17 right, you have all the players where they are,
18 and I'm losing by five points. The simulator
19 would analyze such a situation, so it's going
20 to do an analysis whether user would kick a
21 field goal or try to reach the end zone.

22 Now, if you look at the next

1 sentence, if there is no value, i.e. stored
2 user input. So let's say I've never been in
3 this situation before so there isn't anything
4 stored, recorded for the given -- for the given
5 event and/or situation, then the simulator will
6 generate a random or default response
7 representing the user -- the second user
8 simulated input or response.

9 So it's going to basically say, I
10 don't see anything in user profile in this
11 situation, I'm just going to take a fourth
12 down. Because you're losing and, you know,
13 field goal isn't going to help you.

14 Q. Your understanding of Thomas is that
15 in simulation mode it is not monitoring for
16 events; right?

17 A. That's not what I said.

18 Q. Okay. So in -- I'm just going to say
19 it the exact other way. Your understanding of
20 Thomas is that in simulation mode, it is
21 monitoring for events.

22 A. Well, let's be specific.

1 Q. Okay.

2 A. Go to Thomas column 6, line 28 and
3 that will answer your question. So you see it
4 says "during simulation mode." You see that?

5 Q. I do.

6 A. "The simulator 120 can randomly
7 invoke a response to a situation and/or event
8 based on weighted statistical values of the
9 stored inputs."

10 So the simulators can respond or
11 responds -- can randomly invoke a response to a
12 situation and/or event. So it's monitoring the
13 situation. It's monitoring potential events
14 that you might -- the other side might be doing
15 and it's going to respond. And if you continue
16 reading this paragraph, it will give you an
17 example of I think a player running down the
18 sideline, I think.

19 Yeah, it's an avatar. So if you look
20 at line 36, you see in the example above, "When
21 the simulated opponent's avatar is running down
22 the sideline." So the opponent avatar is

1 coming down the sideline and encounters an
2 opposing player avatar. So the event is you've
3 got the avatar running down the sideline,
4 there's an opposing player avatar, and then it
5 will respond to that situation by, you know,
6 going left, going right or juking or whatever.

7 Q. So in simulation mode, Thomas
8 monitors for events; right?

9 A. Well, as I said to you, the
10 simulator -- I'm on column 6 line 28, you see
11 it says, "The simulator can randomly invoke a
12 response to a situation and/or event." So for
13 it to invoke a response, it's got to be looking
14 at the situations and/or events that are
15 occurring and invoke a response to those events
16 or situation.

17 Q. And when it identifies an event, it
18 will retrieve data fields associated with that
19 event; right?

20 A. So if we continue looking at that
21 paragraph, you see where it says -- line 34 you
22 see where it says, "The stored input associated

1 with a selected value will then be invoked"?

2 Q. I do see that.

3 A. Yeah. So if it has, you know, an
4 appropriate input, if it's been trained on this
5 situation, it will invoke it, otherwise, it
6 will invoke some default response.

7 Q. So I don't want this to feel like a
8 game of hide the ball. But let me direct your
9 attention to column 2 starting at lines 35.

10 A. Of Thomas?

11 Q. Of Thomas, yes.

12 A. Column 2 starting at line 35.

13 Yes, sir.

14 Q. So Thomas describes that it will
15 monitor the computer program for one or more
16 events; right?

17 A. Correct.

18 Q. And then it will retrieve one or more
19 data fields associated with the events; right?

20 A. That's what it says.

21 Q. And you agree that that is what is
22 described in Thomas; right?

1 A. Yes. That's what it says.

2 Q. And it will invoke simulated inputs
3 based on the value of the data fields that it
4 has retrieved; right?

5 A. Yes.

6 Q. And those data fields that it
7 retrieves are associated with circumstances;
8 right?

9 A. As we discussed earlier, yes.

10 Q. And if the circumstances that are
11 reflected in the data field associations, are
12 like those in the -- in the current situation,
13 then it will apply the input for that; right?

14 MR. JAIRAM: Objection to form.

15 THE WITNESS: I didn't understand
16 your question. And again, I feel like my
17 opinions are in my declaration. Is there
18 something specific about my declaration
19 that you're asking about?

20 BY MR. COLVIN:

21 Q. Again, sir, I'm asking you about the
22 operation of what's described in Thomas, which

1 you opine on at length in your declaration,
2 okay?

3 A. Yes.

4 Q. And so --

5 A. But I opine specifically about
6 different things in my declaration, so I'm just
7 asking which part of my declaration are you
8 specifically asking about?

9 Q. Okay. In Thomas, looking at
10 column 2, line about 38 --

11 A. Yes.

12 Q. -- where it says, "It retrieves the
13 one or more data fields associated with the one
14 or more particular events" --

15 A. Yes.

16 Q. -- those are the data fields that
17 were described when we previously talked about
18 the learning mode; right?

19 A. Yes.

20 Q. And those data fields have stored
21 inputs that are associated with circumstances;
22 right?

1 A. We described that earlier. So you
2 have a data structure, obviously.

3 Q. Then how does the system in Thomas
4 know which of those inputs to simulate when
5 it's in simulation mode?

6 A. I don't -- I think you're mixing
7 apples and oranges, sir.

8 Q. Okay. Let me take this piecemeal.
9 In simulation mode, Thomas provides
10 inputs to the simulated system; right?

11 A. The players, right.

12 Q. The avatars?

13 A. The players provide inputs, right.
14 I'm controlling my avatars or whatever. I
15 provide inputs in the simulation mode.

16 Q. Okay.

17 A. I have a user profile that contains,
18 you know, data structures and data fields. I
19 provide inputs to the game, I want you to have
20 an I-Formation for my play and I want to have,
21 you know, a triplets for receivers.

22 Q. Okay. Do you see in lines --

1 column 2, lines 38 to 39 where it says "invoke
2 one or more simulated inputs"?

3 A. Yes.

4 Q. What does it mean for the system to
5 invoke one or more simulated inputs?

6 A. Just what it says, invoke one or more
7 simulated inputs.

8 Q. What's an example of a simulated
9 input? Could it be, "throw a long pass"?

10 A. So if you look at column 5, you see
11 starting at line 23 where it's talking "during
12 operation"? And you see where it's talking
13 about -- so -- and then column -- line 30
14 starts talking about simulation or playback
15 mode.

16 Do you see that?

17 Q. I do.

18 A. So you have a first user that desires
19 to interact with a particular second user via
20 the computer program. The simulator retrieves
21 the use -- second user's profile. Has been
22 created. So you have a second user, he or she

1 has a profile.

2 Then the simulator monitors and
3 analyzes the operation of the computer program
4 in search of particular events and/or
5 situations. And it continues on, this
6 discussion. Now, you see where it says, on
7 line 45, "For example, in the case of a
8 football game."

9 You see that?

10 Q. I do.

11 A. See where it says, if the simulated
12 user is on its own 20 yard line, and just fails
13 to reach the first down mark, after a third
14 down play, you're in a fourth down situation,
15 the simulator can analyze time left on the
16 clock and the score and then it obviously takes
17 on some action.

18 Q. Okay. What's an example of a
19 simulated input? Could it be something like,
20 "throw a long pass?"

21 A. See, like here's an example that I
22 think Thomas provides that might clarify this

1 up. I'm in column 6, lines 35, starting at
2 line 35. And that whole paragraph.

3 So you see it says, "In the example
4 above, when the simulated opponent's avatar is
5 running down the sideline and encounters an
6 opposing player avatar and each of the above
7 responses are given with the respective range
8 of values," so it's been discussing before
9 about the move left, move right type of thing.

10 "The simulator will randomly select a
11 number from one to 100." So that is
12 essentially -- if the number is 53, then the
13 avatar would juke because 51 and 100 was
14 associated with a juke.

15 Similarly, the simulator can randomly
16 select a number from one to 10, then the avatar
17 obviously will spin left because the numbers, I
18 guess, from one to 10 is spin left.

19 So you see the context before that is
20 there is a histogram situation here, where you
21 have, you know, if you look at lines 19 of that
22 same column, "In 100 occurrences of the event

1 where an avatar was running down the sideline,
2 the user spun left 20 times, right 30 times and
3 juke 50 times," you kind of have like a
4 histogram situation; right.

5 So the simulator is going to respond
6 using the user's input from the prior, you
7 know, experiences.

8 I mean, again, is this -- my opinions
9 are here in my declaration. Is there something
10 specific of my -- in my declaration that you're
11 asking about?

12 Q. Could throwing a long pass be an
13 example of a simulated input?

14 A. Well, you see here it says, you know,
15 with this particular player, opposing avatar,
16 so the avatar will juke -- you know, will juke,
17 let's say, or will spin left, so that's an
18 example of a response; right. The avatar could
19 throw a pass if -- you know, assuming it's
20 legal within the game; right.

21 So in this case the avatar obviously
22 is running down the sidelines, got the ball,

1 and the opposing avatar is coming at him or
2 her, and so the avatar is juking -- you know,
3 the system is going to say, you know, juke 50
4 times -- 50 percent of the time and spin this
5 way 30 percent and that --

6 (Clarification by the reporter.)

7 THE WITNESS: Spin left, let's say,
8 30 percent or spin right 20 percent.

9 BY MR. COLVIN:

10 Q. So throwing a long pass could be an
11 example of a simulated input?

12 A. Yeah. I mean, that's one example
13 that you could respond to a situation.

14 Q. And so if I take you back to
15 column 2, lines 39 to 40, the simulated input
16 that is invoked is based on the value of one or
17 more data fields; right?

18 A. Well, you just -- gave you that
19 example, right. The avatar -- I mean, if you
20 look at the example I just gave you, right, the
21 avatar is running down the sideline, the
22 simulated opponent avatar is running down the

1 sideline and encounters an opposing player
2 avatar.

3 So you have two avatars, one going
4 down the sideline, let's say your avatar, and
5 the other avatar is coming at you. So the
6 simulator will randomly select a number from
7 one to 100, so that's essentially -- you see
8 based on the value of the one or more data
9 fields, so you have numbers in data fields that
10 basically say 50 percent of the time you should
11 juke, 30 percent of the time you should spin
12 one way, right, and 20 percent of the time you
13 should spin left because of prior learning
14 experiences.

15 You've encountered this 100 times and
16 developed a -- developed in these data fields
17 for this particular encounter. 30 times in
18 that encounter you rotate -- you spun left --
19 right, 20 times you spun left and 50 times you
20 joked when you've seen that encounter; right.

21 So now the simulator is basically
22 responding based on the value of the one or

1 more data fields which are in this case, in
2 that example obviously you have those three
3 data fields.

4 Q. And it could be the case that when a
5 player is running down the sideline -- let's
6 say a player is running down the right-hand
7 sideline with less than two minutes left to go
8 on the clock, they're down by five, a defender
9 approaches from the left, perhaps they juke to
10 the left 100 percent of the time. That could
11 be the player's attribute; right?

12 MR. JAIRAM: Objection to form.

13 THE WITNESS: I don't -- I don't know
14 what you're asking specifically. But
15 obviously it's -- you know, the simulator
16 has learning -- things that have learned
17 from past playtime that you have played;
18 right? So -- learned in this case to spin
19 right 30 times and spin left 20 -- because
20 when you've played before, you've done
21 this. You've jukeed 50 percent of the time
22 and you right spun 30 percent and left

1 spun 20 percent. So you developed this
2 part of your profile in a sense.

3 BY MR. COLVIN:

4 Q. And so --

5 A. So it's going to respond according to
6 what it sees there.

7 Q. So in the current circumstance when
8 it sees an event that it has learned on, it
9 will attempt to do the response that it has
10 learned in that similar circumstance; is that
11 fair?

12 MR. JAIRAM: Objection. Form.

13 THE WITNESS: Well, I mean, I
14 would -- I would -- I want to keep the
15 language, because I want to be careful
16 that we're not mixing languages from
17 different contexts.

18 And that's why I keep asking, is
19 there something specific in the
20 declaration that you're asking about?
21 Because words have different meaning in
22 different context.

1 So I want to be specific and careful
2 to use the wording as used in Thomas. Not
3 to manufacture wording that's potentially
4 not there.

5 BY MR. COLVIN:

6 Q. Yeah. So with the wording in
7 Thomas -- we're talking about Thomas, I'll give
8 you that.

9 A. Yes.

10 Q. In the current circumstance -- well,
11 I'll take it one step at a time. You
12 understand that Thomas speaks of current
13 circumstance as what the avatar is
14 experiencing; right?

15 A. Yeah, I just gave you that example
16 that we were talking about. I mean, I want to
17 be specific to a language because I think it's
18 important to use the exact language that we are
19 talking about here. So --

20 Q. And so --

21 A. If I may finish my answer.

22 Q. Yes.

1 A. So you see in Thomas column 6 -- and
2 I want to make sure the language is clear. You
3 see, "During simulation mode, the simulator can
4 randomly invoke a response to a situation
5 and/or event based on weighted statistical
6 values of the stored inputs."

7 In this particular example that we're
8 talking about, because the previous paragraph
9 said spin right 30 times, spin left 20 times
10 and juke 50 times, so you have a statistical
11 distribution here that says 20 percent of the
12 times you -- when you encountered this
13 situation you spun left and 30 percent of the
14 time you spun right. So let's use the exact
15 wording of Thomas.

16 Q. Okay. I'm going to use the exact
17 wording of Thomas in column 2 paragraph
18 starting at lines 35. Can you go there, sir?
19 I don't want there to be any misunderstanding
20 about the language that I'm using.

21 A. Yes. I am there.

22 Q. Okay. And Thomas says that the

1 simulated inputs are based on the value of the
2 one or more data fields.

3 You agree that the data fields it's
4 describing there are the same data fields that
5 it described and we discussed previously as
6 part of the learning mode; right?

7 A. Yes. So Thomas has a set of data
8 fields for a given user profile. And just like
9 in this example I just give you it has, let's
10 say -- let's call them three data fields, one
11 that you spun left 20 times, so it's got the
12 number 20 recorded in a spin left data field.
13 It's got a number 30 recorded in the spin right
14 data field. And it's got a number 50 recorded
15 in the juke data field.

16 So it invokes one or more simulated
17 inputs based on the value of the one or more
18 data fields. So you have data fields in Thomas
19 that has statistical data in them or flags or
20 data. And it's going to invoke a simulated
21 input based on that.

22 Q. And those data fields are associated

1 with certain circumstances, which could include
2 things like player's position on the field;
3 right?

4 A. Well, if you look at his language,
5 see it says, for the one or more particular
6 events, retrieve the one or more data fields
7 associated with the one or more particular
8 events, and invoke, et cetera, et cetera.
9 That's what Thomas states.

10 Q. So my question was about
11 circumstances and your answer was about events.
12 So let me ask my question again, because I'm
13 using the words of Thomas.

14 The data fields are associated with
15 certain circumstances which could include
16 things like a player's position on the field;
17 right?

18 A. So if you look at the previous few
19 lines of Thomas in that same column, you see
20 the simulator is further configured -- I'm on
21 line 30 of Thomas, column 2. "The simulator is
22 further configured to record one or more user

1 inputs in response to the occurrence of the one
2 or more events, store the one or more user
3 inputs in the one or more data fields and
4 associate the one or more data fields with the
5 one or more events and the one or more current
6 circumstances."

7 Q. Okay. So my question was, those data
8 fields are associated with circumstances that
9 could include things like player's position on
10 the field; right?

11 A. Potentially speaking, but I mean,
12 again, the language -- you have to be careful
13 with the language here in terms of the context.
14 Circumstances in Thomas is -- has a context to
15 it. And circumstances in the '134 has a
16 different context to it. So I want to be
17 careful about the context, not to mix claim
18 language terminology.

19 Q. Okay. Turn to column 4 starting at
20 lines 19 to 20, 21. We looked at this passage
21 earlier.

22 A. Yes, sir.

1 Q. Now, the situations here, situation
2 655, those are circumstances; right?

3 A. So you see it says -- this is where
4 it's talking about Figure 4 as we discussed
5 earlier; right. So you have a block diagram
6 essentially in Figure 4 that kind of gives you
7 a user profile and breaks things down.

8 So you see on line 16 it says, "An
9 event 685 is the particular action
10 occurring" -- like a pump fake; right --
11 whereas a situation is the surrounding
12 circumstances during which an event may take
13 place."

14 So Thomas uses situation and uses the
15 word "circumstance" to describe, you know, the
16 surrounding circumstance, like the time on the
17 clock, the location of the players, the
18 formation, whatever. And then gives you an
19 example to clarify that.

20 Q. So you agree that circumstance in
21 Thomas could include things like location of
22 players on the field; right?

1 A. Yeah. Well, you see it says where
2 the situation is the surrounding circumstances
3 during which an event may take place. So the
4 situation is the surrounding circumstances.
5 And you see down below on that example a
6 situation may be how much time is left on the
7 clock or the position of the players on the
8 football field.

9 So it states that clearly there.
10 Situation I have two minutes on the clock, and
11 the defensive formation is in 6-2. Do you know
12 what I mean when I say "6-2"?

13 Q. I do.

14 The position of the players on the
15 football field could also be whether or not a
16 player is open, a receiver is open, whether or
17 not linebackers are blitzing, et cetera; right?

18 A. Yeah. I mean, it's the situation
19 which comprehends the surrounding
20 circumstances. In this case, you know, he
21 gives you an example, time left on the game or
22 the position of players on the field. Yeah, so

1 a quarterback, you know, may see an open
2 receiver and toss a long bomb.

3 MR. COLVIN: Okay. We've been going
4 on about an hour and 15 here, let's take a
5 break.

6 (Thereupon, a brief recess was taken.)

7 BY MR. COLVIN:

8 Q. I want to look at some specific
9 examples now in Thomas. The first one I want
10 to look at is the pass out of shot example.
11 And this starts at column 7, line 55, I
12 believe, if you want to turn there and take a
13 look.

14 A. Pass out of shot, this is -- I think
15 we're talking about basketball here; right?

16 Q. That's right, we're talking about
17 basketball. I apologize, but Thomas talks
18 about basketball so I've got to talk about
19 basketball.

20 A. So I have apologized, but my
21 knowledge of basketball is rather limited. So
22 we are at line 55?

1 Q. Yes, sir. Column 7, line 55.

2 A. Yeah.

3 Q. And you see that this paragraph,
4 line 55 to 64, is talking about, what it
5 describes as a pass out of shot event?

6 You understand that?

7 A. I understand what it's talking about,
8 yes, a pass out of shot.

9 Q. And the paragraph is set up so that
10 the first part of it talks about what happens
11 during a learning mode, and then the second
12 part of it talks about during playback mode.

13 You understand that?

14 A. Yes, I see that.

15 Q. And recall our discussion from
16 earlier today about learning mode where during
17 learning mode there is an input, a user input
18 stored in a data field that's associated with
19 events and circumstances; right?

20 A. Generally speaking, yes.

21 Q. And so in this particular example,
22 this pass out of shot event example, can you

1 tell me what the user input would be that would
2 be stored in the data field?

3 A. Ask your question again.

4 Q. Sure. No problem at all.

5 In this particular example, the pass
6 out of shot event example, can you tell me --

7 A. Yes.

8 Q. -- what the user input would be that
9 would be stored in the data fields?

10 A. I mean, I'm not, you know, greatly
11 familiar with the strategy of a basketball
12 game. But I would assume the user will see the
13 avatars in a certain positioning and would
14 basically say pass to this avatar or something.

15 Q. And so would you agree that the --
16 that what's recorded in the data field would be
17 pass and which avatar is passed to at least?

18 A. Well, if you read the language there,
19 let's be careful and specific. And again, I'm
20 not the best strategist in basketball. The
21 simulator, during learning mode, records a shot
22 type. So whatever that is in the game, maybe,

1 I don't know, pass low or pass high or
2 something, which avatar passed and which avatar
3 was passed to.

4 And then for the current circumstance
5 it would record how open the receiving avatar
6 was and how covered the passing avatar was. So
7 that's capturing the circumstances of the
8 avatar.

9 (Clarification by the reporter.)

10 Q. And so to do that, it needs to know
11 which avatars are on the user's team and which
12 avatars are on the opponent's team; is that
13 right?

14 A. Yeah. I mean, it would need to know,
15 are we talking about learning mode or playback
16 mode, let's be specific.

17 Q. Thank you for that clarification.

18 For now we're talking about learning
19 mode.

20 A. Yes.

21 Q. So if you'd like, let me ask my
22 question again. I'll bake that into it just so

1 the record's absolutely clear.

2 So in learning mode, the system needs
3 to know which avatars are on the user's team
4 and which avatars are on the opponent's team;
5 is that right?

6 A. That's correct.

7 Q. And --

8 A. It would know that, yes.

9 Q. And it also needs to know the
10 location of the different avatars to know if --
11 to know how open the receiving avatar is;
12 correct?

13 A. Yes. So it would need to know -- I
14 mean, this is obviously a virtual environment,
15 so it would know -- it would know where they
16 all are.

17 Q. And it stores -- all of that
18 information is in learning mode, it stores that
19 information in data fields; right?

20 A. Yes. Generally, speaking, yes. I
21 mean, it stores the appropriate information in
22 the data fields.

1 Q. Well, it's not just the -- what do
2 you mean by appropriate information? I don't
3 want to assume or put words in your mouth.

4 A. Well, it stores the information of
5 this particular circumstance. See, it says,
6 "For current circumstances the simulator
7 records how open the receiving avatar was." So
8 it's going to see the location of the receiving
9 avatar and how open that receiving avatar was,
10 so it's going to know where the opposing avatar
11 is relatively speaking to that avatar.

12 Q. I'm going to give you an example and
13 I want you to tell me if you think this is
14 something that would reasonably understood
15 based on what we just read about learning mode.

16 So could a circumstance like this be
17 a user retrieves a rebound and then has to
18 decide if it is going to pass to a shooter
19 beyond the three-point line, and then it -- the
20 user, let's assume, sees that the player at the
21 three-point line is unguarded, and it -- the
22 user passes to that other player.

1 In that circumstance would the pass
2 be stored in the circumstance of retrieved a
3 rebound and the receiving player being
4 unguarded also be stored?

5 MR. JAIRAM: Objection, form.

6 THE WITNESS: I don't understand --
7 first of all, like I said, I'm not -- I'm
8 not that well versed in the game of
9 basketball, specifically with all these
10 different terminologies. And I didn't
11 understand your question exactly what --
12 so you'll have to go a little slower with
13 your question and maybe more step by step.
14 It wasn't clear to me what you're asking.

15 BY MR. COLVIN:

16 Q. Okay. That's fair.

17 I want you to tell me if -- in this
18 circumstance what would be stored. Imagine the
19 user is playing the game, the user retrieves a
20 rebound and then passes the ball to an
21 unguarded player beyond the three-point line.

22 A. So the avatar, one of the avatars of

1 the user retrieves a rebound?

2 Q. So this is in learning mode and so
3 I'm saying that, yes, the user is controlling
4 the avatar that retrieves --

5 A. The user -- sorry, go -- please, go
6 ahead.

7 Q. Yeah. Sorry.

8 In my example the user is controlling
9 the avatar that retrieves the rebound and the
10 user makes the pass to another avatar that's
11 unguarded beyond the three-point line.

12 A. So let me make sure I understand this
13 correctly. You have five avatars controlled by
14 a given user in the game; correct?

15 Q. I would assume that one avatar is
16 controlled by a user at any given time.

17 A. Correct. But you have five avatars
18 or whatever. You have number of avatars that
19 user A is controlling.

20 Q. Fair enough. We'll go with that
21 example.

22 A. Okay. And one of those avatars just

1 retrieved the rebound. And then what?

2 Q. Then that user passes the ball to an
3 unguarded player beyond the three-point line?

4 A. So the -- that avatar passes the ball
5 to some center, whatever, down beyond the
6 three-point shot line or whatever?

7 Q. Yes.

8 A. Okay. So that would be similar to
9 that football example that we talked about
10 earlier on -- where was that? So if you go
11 back to column 6, lines 28 to 44, you have a
12 very similar example, and I'm much more well
13 versed with football.

14 So you have a very similar example;
15 right. You have an avatar running down the
16 sideline, just like your avatar just retrieved
17 the rebound -- excuse me -- and you have an
18 opposing avatar closing in on that avatar just
19 like the opposing players on the other team
20 basketball would be obviously also trying to
21 get that rebound; correct?

22 So the user A avatar that just

1 retrieved the rebound will be very similar to
2 the football avatar running down the sideline.
3 And at that point that avatar will maybe pass
4 the ball to some other avatar somewhere just
5 like this one would have spun right, and
6 would -- might have passed it to some other
7 avatar somewhere else, just like that one would
8 have spun left, and it might have taken another
9 shot from there, assuming that would be legal,
10 just like that avatar might have juke.

11 So you have a very similar
12 circumstance. So you would be recording very
13 similar information, like the avatar pass to
14 the -- pass the three-point line 10 times out
15 of 100, went back for another shot 50 times out
16 of 100, and passed to the sideline avatar,
17 whatever, 40 times out of 100.

18 Q. Okay.

19 A. And I'm making all these numbers up,
20 by the way.

21 Q. So in my example where the user
22 retrieves the rebound and passes to an open

1 player beyond the three-point line, what gets
2 recorded in the data fields in the learning
3 mode?

4 A. Same as the football example.

5 Q. So what are they?

6 A. You would record, in your data field,
7 just like you recorded the football, you would
8 have a data field you spun left 30 times, you
9 would have a data field you passed the ball,
10 past the three-point line 10 times.

11 So you have data fields that are
12 relevant to the game that you're playing.
13 Obviously in the football game you spun left 20
14 times, you spun right 30 times and you juke 50
15 times, so you recorded those three into a --
16 like a histogram kind of data fields.

17 So you would record the same thing
18 from the rebound into -- I'm assuming there are
19 three or four actions that you would do after
20 rebound. Again, I'm not versed -- well versed
21 in the game of basketball, but whatever actions
22 you would do off of rebound, you would do this

1 one so many times and that one so many times,
2 you would record that into your data fields.

3 So then in playback mode, the
4 simulator would use that information to, you
5 know, render the appropriate action.

6 Q. So in my example where the user
7 retrieves a rebound and passes the ball to an
8 open player, you would agree that the user
9 input of a pass would be recorded in the data
10 field; right?

11 A. I mean, if the user passed the ball
12 just like if the running avatar was running
13 down the sideline, and the user juke, that
14 would be recorded. And after 100 occurrences
15 of that event, you recorded 50 jukes that the
16 user has done; right. So you recorded those 50
17 and you recorded 20 spin left and 30 spin
18 rights.

19 So that's what the simulation, the
20 learning mode has recorded for your -- you
21 know, for basically decisions that the users
22 have made.

1 Q. Okay. So you agree that in my
2 example when a user retrieves a rebound and
3 passes the ball to an unguarded player beyond
4 the three-point line, that the input of a pass
5 is recorded in data field; right?

6 A. Yeah. You would record that you have
7 passed the ball.

8 Q. Okay.

9 A. If you've taken 100 rebounds and
10 you've passed 50 rebounds, 50 times of the 100
11 rebounds you passed, to the three-point line
12 that would be recorded.

13 Q. And other things are recorded as well
14 in learning mode in my example; right?

15 A. Well, you would have to be specific
16 what you mean by "other things." We have to be
17 very specific here.

18 Q. Well, we also know that in my example
19 the location of the avatar that received the
20 pass, and the location of surrounding defenders
21 is also recorded; right?

22 A. So what it states is -- let's just be

1 very clear and specific. So column 7,
2 line 855, you see a pass out of shot event, so
3 let's assume you took a shot, you grabbed the
4 rebound and you're going to do a pass, the
5 simulator, during learning mode, records a shot
6 type, long pass to the three-point line or
7 something, which avatar passed, so which one of
8 those avatars passed, and which avatar was
9 passed to.

10 And for the current circumstances,
11 the simulator will record how open the
12 receiving avatar was that the -- has been
13 passed the pass to. And how covered the
14 passing avatar was. So it's recording the
15 circumstances of how this pass out of shot took
16 place. Just like the player running down the
17 sideline in the football example. Those two
18 examples are very similar.

19 Q. And just to be specific and clear
20 here, in my example where a user avatar
21 receives a rebound and passes it to an open
22 player beyond the three-point line, the pass is

1 recorded and the circumstances around that pass
2 are also recorded, that's fair; right?

3 A. Well, the circumstance as designed
4 within the game is recorded, yes. So it's not
5 like -- you know, the game has certain
6 limitations, obviously. So the circumstance in
7 the context of what the game itself is, is
8 recorded.

9 Again, I mean, is this in reference
10 to something in my declaration that you're
11 asking about? My opinions are in my
12 declaration. And is there something specific
13 that you're asking about?

14 Q. In this specific example, included in
15 this circumstances that are recorded would be
16 the positions of avatars; right?

17 A. Well, you see -- I mean, it says for
18 current circumstances, line 57, the simulator
19 records how open the receiving avatar was. So
20 it has to know where the receiving avatar is.
21 And to know how open it is, has to know where
22 the opponent avatars are.

1 So it records how open the receiving
2 avatar was and how covered the passing avatar
3 was. So it's got to know -- to know it's
4 covered, it's got to know where the opponent
5 avatars are in relation to the passing avatar.
6 This is a virtual game. Obviously, it knows
7 all the locations.

8 Q. And it records those things in
9 relation to this particular pass out of shot
10 event; right?

11 A. Well, it will -- it will obviously
12 record your decision, and it knows where these
13 things are.

14 Q. Well, it records your decision and it
15 records where these things are. And it -- and
16 it -- and it associates those two things
17 together; right?

18 A. Well, it will do -- I mean, like if
19 you look at line 59, so during playback, for a
20 pass out of shot event, so it's the same event
21 occurring, whatever this pass out of shot event
22 is, the simulator will analyze how well the

1 passing avatar and the receiving avatar are
2 covered.

3 So it would analyze -- they'll look
4 at the passing avatars and analyze the
5 receiving avatar to see how well they're
6 covered.

7 So obviously, to analyze -- so in my
8 opinion here, obviously -- in my opinion here,
9 you would be looking at, you know, it's
10 analyzing how well the passing avatar is
11 covered, so it's got to know where the opponent
12 avatars are.

13 Q. And so in learning mode, it will
14 record -- and I don't think this is
15 controversial. I mean, I'm just going to read
16 straight from the spec here at line 57. In
17 learning mode, it will record --

18 A. Yes.

19 Q. -- how open the receiving avatar was
20 and how covered the passing avatar was; right?

21 A. You read that correctly.

22 Q. And you understand that that's

1 actually what it does; right?

2 A. Yes. You read that correctly.

3 Q. And it records the pass and it
4 associates that pass with that particular
5 circumstance; right?

6 A. The pass out of shot event, just like
7 the avatar in the football game that I gave you
8 that example. Running down the sideline
9 example football.

10 Q. And then in the simulation mode or
11 the playback mode as it's described here, down
12 at line 62, it says, "The simulator 120 will
13 invoke a pass if the current circumstances meet
14 the criteria, e.g. how much the passing and
15 receiving avatars are covered."

16 You see that?

17 A. Yes.

18 Q. What does it mean by "meet the
19 criteria"?

20 A. Well, it's not specifically defined
21 in Thomas. It doesn't say exactly how it meets
22 the criteria. It just gives you an example,

1 e.g., how much the passing and receiving
2 avatars are covered. It doesn't describe
3 exactly what that is.

4 Q. And so you don't know what meet the
5 criteria means in this example in Thomas?

6 A. Well, Thomas does not describe --
7 excuse me.

8 Thomas does not describe what meet
9 the criteria is. But Thomas provides you an
10 example that says how much the passing and
11 receiving avatars are covered. So it's
12 essentially looking at the locations of the
13 avatars to see, you know, the distance from an
14 avatar to another avatar, opponent avatar, to
15 see -- to assess the coverage. But it doesn't
16 provide a detail of how this criteria is
17 analyzed.

18 Q. And so how does Thomas know whether
19 or not to invoke a pass or to hold on -- or to
20 not invoke the pass, I should say?

21 A. Well, it will look -- you see it says
22 the simulator will invoke a pass if the current

1 circumstances meet the criteria, e.g., how much
2 the passing and receiving avatars are covered.
3 So it's going to look at the passing avatar,
4 see where the opponent players are, because it
5 knows where all the players are.

6 This is a virtual game; right. It's
7 not analyzing imagery. Knows where the players
8 are. It knows where the passing avatar is
9 located and how close are the opponent avatars
10 to it, and it knows where the receiving avatar
11 is located, or receiving -- there may be more
12 one than one that it wants to send the ball to.
13 And where the opponent players are located to
14 that receiving avatar. So it has the location
15 information of these players, the avatars.

16 Q. Right, but how does it know whether
17 it should pass or not?

18 A. It doesn't define the criteria, so
19 that's essentially game knowledge in a sense;
20 right. It doesn't define what that criteria
21 is, it just knows that where these locations --
22 see, it says meet the criteria, how much the

1 passing and receiving avatars are covered.

2 So it knows the location of the
3 avatars, it knows how much it's covered. And
4 for a given play it will say, okay, this avatar
5 is -- the opponent avatar is within half a yard
6 or half a meter from my avatar, pass the ball.

7 So it doesn't define the criteria
8 specifically. And there's probably something
9 that's game and action specific to the game.

10 Q. Is -- hold on just a moment. I'm
11 sorry.

12 Is determining whether or not the
13 current circumstance meets the criteria related
14 to the learning that happens?

15 A. Well, I mean, if you look at the
16 starting at line 55, you see it says for a pass
17 out of shot event, whatever that is, the
18 simulator during learn mode records a shot
19 type, okay. So it records the shot type, which
20 avatar pass, and which avatar was passed to.
21 So it's recording that.

22 It's also the current circumstances

1 around this pass out of shot event, the
2 simulator records how open the receiving avatar
3 was and how covered the passing avatar was. So
4 it is recording the receiving avatar is open,
5 because the player, the opponent player is a
6 meter away.

7 So it's recording that information
8 for this pass out shot event, just like, you
9 know, the player that I gave you the example
10 running down the field on the sideline.

11 Then in the playback mode for this
12 exact situation or this pass out of shot event,
13 this exact event, the simulator will analyze
14 how well the passing avatar and receiving
15 avatars are covered. And if they meet a
16 criteria, will invoke a pass if they meet the
17 criteria, which is not defined specifically how
18 related to the game itself, obviously, because
19 there's a strategy in a game.

20 And, you know, how much the passing
21 and receiving -- e.g., how much the passing and
22 receiving avatars are covered.

1 Q. And so is determining whether or not
2 the current circumstances meet the criteria
3 related to what was learned in the learning
4 mode?

5 MR. JAIRAM: Objection to form.

6 THE WITNESS: I think I already
7 answered that.

8 BY MR. COLVIN:

9 Q. Well, we may disagree about that,
10 sir, but I don't want to argue with you about
11 it.

12 Can you try to answer that question
13 again?

14 A. So as I gave you in the football
15 example, so you have a player running the down
16 the sideline, you have an event, and you have
17 an opposing avatar coming. That player is
18 going to spin right. So as you're playing that
19 player, you spun him right 20 times, that's
20 recorded, every time you spun right, where --
21 where the other player was when you spun right.

22 You spun left 30 times, that's also

1 recorded where the other player was. And you
2 juke 50 times, so that's also recorded. So in
3 this case with the pass out of shot event, you
4 pass to that avatar over here at the
5 three-point line 20 times, and you pass to this
6 other avatar over here 30 times, and you pass
7 to this other avatar over here 50 times.

8 So that is essentially what they're
9 saying. It's recorded during a learning mode
10 as you're learning, as, you know, you're
11 playing the game.

12 So now in the simulation mode, it's
13 going to look at the passing avatar and look at
14 the circumstance and activate this pass out of
15 shot event and decide which avatar to send it
16 to.

17 Q. And so in this pass out of shot
18 event, and specifically where it says meets the
19 criteria, e.g. how much passing and receiving
20 avatars are covered, is that based on what it
21 learned in the learning mode?

22 A. If it has learned it in the learning

1 mode, if it's not the first time seeing this,
2 it would have some histogram knowledge just
3 like the player running down the sideline. And
4 it would have some histogram knowledge, and it
5 would activate, you know, based on that
6 histogram knowledge. But if this is a very
7 first time it's seeing this and it's not
8 learned it before, then it will give you a
9 default response.

10 Q. Let's assume what perhaps is a
11 simplistic example, but I'm going to use it to
12 remove some of the variables. Let's assume
13 that it learned that if the player is open, a
14 pass was made, if the player was covered, a
15 pass was not made. Is that -- or do you
16 understand that? Is that fair?

17 A. That's fair.

18 Q. Okay. And so it's binary; right?
19 Player open, make pass. Player covered, don't
20 make pass. Is that fair?

21 A. Fair.

22 Q. If that's what it learned, then how

1 would the simulator understand meeting the
2 criteria to determine if it needs to invoke a
3 pass?

4 A. It would have to look at the player
5 that it wants to pass to, and it would have to
6 see if that player is open.

7 Q. If the player is open, like the
8 player is open, like the player was open in the
9 learned scenario, what happens?

10 A. It will send the pass.

11 Q. Can we take a look at another
12 example? And I apologize, it's going to be
13 another basketball example?

14 A. I'm becoming -- I'm learning.

15 Q. You're going to be a basketball coach
16 before the end of this deposition, sir.

17 A. Yeah. You're testing my knowledge of
18 basketball.

19 Q. Let's take a look at the pump fake
20 example described in column 8 starting at
21 line 8, okay?

22 A. But that's a football example, is it

1 not?

2 Q. Well, I'll tell you what, if you want
3 it to be a football example, you can make it a
4 football example. I think it's probably
5 agnostic.

6 A. It probably doesn't matter, but it
7 seems like -- a pump fake sounds, to me, like a
8 football term, but I guess maybe it's used in
9 basketball as well.

10 Q. Okay. Let's do it.

11 A. You can think about it as basketball
12 and I'll think about it as football.

13 Q. Let's don't do that. I tell you
14 what, I'll think about it in football; any
15 examples I'll use from it, I will make football
16 examples, because I'm fluent in football also.

17 A. So we're on column 8, line 8.; is
18 that correct?

19 Q. Yes. Column 8, line 8.

20 So -- and these questions are going
21 to be pretty similar to what I asked in the
22 other example, I'm just hopeful that in talking

1 about it in multiple examples we can, you know,
2 further enhance everybody's understanding of
3 this stuff. So...

4 Okay. So in this example you agree
5 that the event is a pump fake event; right?
6 Says it right there in line 8.

7 A. Yes. You're absolutely clear. It
8 says it, for a pump fake event. It's not any
9 clearer than that.

10 Q. And during the learning mode, certain
11 things are recorded; right?

12 A. Yes.

13 Q. One of the things that is recorded is
14 how often a user pump fakes; right?

15 A. Correct.

16 Q. And it stores that information in a
17 data field; right?

18 A. Yes. I mean, obviously, you see that
19 it says it records how often a user pump fakes.
20 And for the current circumstances it records
21 how covered the user was and user's location;
22 obviously where the user is on the field.

1 So it's recording how often you pump
2 fake, and just like the player running down the
3 sideline, how often you juke and how often you
4 spun right and spun left.

5 Q. And it could be that -- again, just
6 to make it binary, if the user is covered, they
7 pump fake; if the user is open, they release
8 the ball?

9 A. I would assume that would be correct.
10 I mean, I would assume if you're covered, you
11 pump fake to try to get the other player to
12 jump and then you would send the ball.

13 Q. And in this pump fake event, it would
14 associate -- again, in the learning mode, it
15 would associate pump fake with a covered user
16 and not pump fake with an open user, in my
17 simplistic example; is that fair?

18 A. Yeah. It would record -- I mean,
19 it's recording how often user pump fakes, so
20 it's going to see that you're covered, you pump
21 fake. You're covered, you pump fake. You
22 open, you release. So it's going to release --

1 you know, it's going to record -- because it's
2 looking at the circumstances also; right?

3 Q. Right.

4 A. The user and your location. If
5 you're, you know, 50 meters away from the
6 basket, you're probably not going to release
7 it, I would assume; right?

8 Q. Fair. Yeah. That's fair.

9 A. So it's going to -- I mean, it's
10 going to know where you are -- it knows where
11 you are on the field. It knows -- you know, it
12 probably has statistics of how well you shoot
13 from this location. And it knows, you know,
14 where the opponent players are. So if the
15 opponent player's within, you know, half a
16 meter or something, if the opponent player is
17 close enough to you, you may pump fake.

18 Q. Right. I thought the point you made
19 was a good one about -- I guess we'll dip back
20 and forth between basketball and football, I
21 think we understand what we're talking about
22 here. But it has to know the user's location

1 on the court to know if the user is in a
2 position where it would be advisable, I guess,
3 to shoot or to perhaps even fake a shot.

4 Does that make sense?

5 A. Yeah. It knows the user location on
6 the court; right. So if it has learned, prior
7 to that, that, you know, you're 50 meters away,
8 don't toss the ball, don't release the ball.
9 It knows that. So it knows the user's location
10 on the field, it knows the opponent user
11 location on -- the opponent player on the
12 field, and it records how often you've pumped
13 faked when you're in this situation.

14 Q. Yeah. It's essentially trying to
15 build data fields that show the circumstances
16 in which a user pump fakes. And conversely,
17 where there are no pump fake events, those are
18 things where the user -- places where the user
19 would not pump fake?

20 A. Yeah. So it's establishing a
21 statistical, let's say, profile; right. So
22 just like the juking player running down the

1 field. A player running down the field, you
2 juke 50, spun left 30, spun right 20, so it's
3 established a profile that, you know,
4 50 percent of the time you juke when you're in
5 this situation. So in this case, for a pump
6 fake, it's going to establish that type of
7 histogram information.

8 Q. I could envision a system or a data
9 structure that was -- essentially showed in
10 this particular circumstance, perhaps it's a
11 very narrow circumstance the user always pump
12 fakes. There may be other circumstances where
13 they pump fake 50 percent of the time, and
14 maybe there's other circumstances where they
15 never pump fake.

16 Does that make sense?

17 A. I'm not sure what you're saying, but
18 it -- obviously it knows how often a user pump
19 fakes, so it's established some statistical
20 information on it.

21 Q. Well, let me -- I'll try to be more
22 specific. I understand my question was perhaps

1 a little vague.

2 Perhaps, this is just an example,
3 perhaps the user -- if the user is 15 feet away
4 from the bucket, and is covered, the user will
5 always pump fake. And then maybe if the user
6 is 30 feet away from the bucket, and is
7 covered, they'll pump fake 50 percent of the
8 time. And if they're 50 feet away from the
9 bucket and covered, they never pump fake.

10 Does that make sense?

11 A. I understand your question. I'm not
12 sure what the exact -- I understand what you're
13 saying. I'm not sure exactly what you're
14 asking.

15 Q. Well, I'm just asking -- I'm asking
16 you if that is the type of information that
17 would be stored in the data fields with
18 associated circumstances.

19 A. Well, you would -- I mean, if you
20 read this passage; right, it records how often
21 user pump fakes, and it says "for current
22 circumstances," so it's looking at the current

1 circumstances of that pump fake, right, or of
2 the event.

3 It's looking at the current
4 circumstances and it's basically recording --
5 records how covered the user was and user's
6 location. So it's going to know how -- what
7 the coverage of the user is, and it's going to
8 know the user's location on the field, whether
9 it's 20, 30 or 50 meters away. And it knows
10 whether you pump faked or didn't pump fake.

11 So it's recording this information in
12 like a statistical histogram, just like the
13 joking player I talked to you about earlier --

14 Q. Yeah.

15 A. -- player running down the sideline.
16 So it's developing this histogram of data in a
17 sense.

18 Q. So I think we're seeing completely
19 eye to eye on this. I guess I would just ask
20 you if it is a -- if it's conceivable that the
21 histogram would look something like -- this is,
22 again, a simplistic example, but I don't think

1 we disagree: That at 15 feet away and covered,
2 there's always a pump fake, and at 50 feet away
3 and covered there's never a pump fake.

4 That's conceivable; right?

5 A. Well, it would be part of the
6 histogram. Yeah. So in this case you have a
7 two-dimensional histogram; right. Distance
8 versus, you know, pump fake or whatever; right.
9 Because you have essentially a histogram of
10 data that you're recording the distance, where
11 the player is in relation to the basket. You
12 know the player's location on the field, you
13 know where the baskets are. It's a virtual
14 game; right. So you have the entire virtual
15 game recorded system understood, right, so you
16 know where exactly everybody is.

17 So it's going to record, you know,
18 your location and you pump faked at that
19 location X many times. And it's going to look
20 at the circumstances around you to say, okay,
21 when you did this pump fake, where did the
22 other players -- where were the other players,

1 and where were you.

2 Q. Yeah. And I guess, all I'm trying to
3 ask you to agree with is that that histogram
4 could show that a particular user pump fakes
5 100 percent of time when they're 15 feet away
6 from the basket and covered?

7 A. That would conceivably be -- you know
8 yes. I mean, the histogram -- if you've pump
9 faked 100 percent of the time when you're
10 15 feet away, then that would be recorded into
11 your statistical histogram.

12 Q. Okay. And so during playback mode it
13 says -- this is at column 8 starting at
14 line 11.

15 A. Yes.

16 Q. The playback mode -- "During playback
17 mode 600, the simulator will monitor for a
18 shoot event and analyze the location of the
19 simulated user and the defensive coverage."

20 You see that?

21 A. Yes. You read that correctly.

22 Q. Okay. And then it goes on to say if

1 the -- sorry, "If criteria is met, the
2 simulator will invoke a pump fake."

3 A. Yes. You read that correctly.

4 Q. Okay. And so given the example that
5 I previously put forward to you about the
6 100 percent of the time the user will pump fake
7 when he's 15 feet away and covered --

8 A. Yes.

9 Q. -- during playback mode -- let me
10 just be clear.

11 If in that circumstance during
12 playback mode, the simulator detects a shoot
13 event when the user is 15 feet away from the
14 bucket and covered, what will happen?

15 MR. JAIRAM: Objection to form.

16 THE WITNESS: And at that location it
17 was 100 percent pump faked; right?

18 BY MR. COLVIN:

19 Q. Correct.

20 A. So during playback mode the simulator
21 will monitor, for a shoot event -- let's assume
22 this is a shoot event situation, and analyze

1 the location of the simulated user and
2 defensive coverage. So it's going to know
3 you're 15 feet away from the bucket and look at
4 the defensive coverage. And based on the
5 learning mode, it's going to say you
6 100 percent of the time pump faked from here.

7 So more likely than not it's going to
8 pump fake.

9 Q. Why do you say "more likely than
10 not"?

11 A. Well, I mean, in this binary, very
12 simplistic example, it would pump fake. But
13 there are -- obviously, there are examples
14 where -- you know, you have multiple
15 situations. But in this very simplistic
16 example, if it sees you 15 feet away and you've
17 always pump faked from there, then it's going
18 to pump fake.

19 MR. COLVIN: Give me just a moment
20 here, sir.

21 THE WITNESS: Take your time.

22 MR. COLVIN: So we've been going

1 50 minutes here, I'm kind of at a natural
2 break point, let's take a break.

3 (Thereupon, a brief recess was taken.)

4 (Thereupon, Exhibit 1001 was marked for
5 identification.)

6 BY MR. COLVIN:

7 Q. Dr. Saber, do you see Exhibit 1001,
8 which is the '134 patent?

9 A. I do, sir.

10 Q. And would you open that document when
11 you get a chance?

12 A. Yes, sir, I'm downloading it as we
13 speak.

14 Q. Dr. Saber, do you have the '134
15 patent, Exhibit 1001, opened in front of you?

16 A. I do, sir.

17 Q. I'm going to direct you to Claim 7,
18 which is in column 173.

19 A. Yes. Yes, sir, I'm at Claim 7.

20 Q. Okay. And Claim 7 is column 173,
21 starting at line 8.

22 Are you there?

1 A. Yes.

2 Q. Claim 7 introduces a term down around
3 line 13 that is "temporally." I want to talk
4 about temporally for a minute.

5 Do you see where temporally is
6 located in the claim?

7 A. Yes. I'm also looking at my
8 declaration on page 37 as well.

9 Q. Okay.

10 A. Because I do have opinions on this
11 claim.

12 Q. Great.

13 And so you see that this claim -- I'm
14 just going to read it -- requires that, "A
15 determination is made that the first one or
16 more instructions sets for operating the first
17 avatar of the application temporally correspond
18 to the first one or more object
19 representations."

20 Do you see that?

21 A. Yes.

22 Q. Do you understand what that means,

1 sir?

2 A. So you see the object representations
3 of '134 are obviously described in the '134,
4 but they're object representations that have --
5 that are temporally, you know, timed,
6 essentially. They are temporally -- it has
7 temporal correspondence between them.

8 So you have spatial and you have
9 temporal. So you have an object itself, you
10 have a spatial, let's say, representation of
11 the object. But you also have a temporal
12 representation, and temporal usually refers at
13 a time. Like if you're looking at video,
14 digital video frames, there is a spatial
15 representation within the frame and there are
16 frame to frame, that's considered to be
17 temporal.

18 Q. So this is describing a temporal
19 correspondence between instruction sets and
20 object representations; right?

21 A. Yes. I mean, the claims states --
22 obviously this claim depends from Claim 1,

1 right, so there's a dependence from there,
2 wherein to correlate the first one or more
3 object representations with a first one or more
4 instruction sets for operating the first avatar
5 of the application.

6 So you have an avatar, you have an
7 application, you have instruction sets.
8 Obviously the avatar, you're operating that in
9 time; right? So there's instruction sets for
10 operating the avatar, and you're correlating
11 those instruction sets with the object
12 representations.

13 The bolded part of the claim in my
14 declaration, a determination is made that the
15 first one or more instruction sets for
16 operating the first avatar of the application
17 temporally correspond to the first one or more
18 object representations.

19 So you have a temporal connection
20 with the instruction sets because obviously the
21 objects are moving in time; right? So you have
22 to connect the instruction sets to the motion

1 of the object representations -- to the object
2 representations as they evolve in time.

3 Q. In other words, it's not an
4 instruction set associated with the
5 circumstances that were five minutes ago. It's
6 the circumstances associated -- it's the
7 instruction sets associated with circumstances
8 right now at the present time of the
9 instruction set; is that fair?

10 A. I don't understand what you're
11 asking. Not sure. I would use the word
12 "correlate," not "associate" because it means
13 something different here than in Thomas. You
14 have to be very careful with the choice of
15 wording.

16 Q. Okay. I'll use "correlate" then.

17 So this correlation between
18 instruction sets and object representations,
19 the word "temporally" just means that the
20 correlation is to those things at a particular
21 time, not just generally. Is that fair?

22 A. Well, I think you're simplifying --

1 oversimplifying the discussion here. So you
2 have one -- the first one or more instruction
3 sets. So let's just say the first one
4 instruction sets for operating a first avatar
5 of the application temporally correspond to the
6 first or more object representations.

7 So you have a temporal correspondence
8 between that instruction set and the object
9 representations. As the object representations
10 are evolving in time, those instruction sets
11 obviously change, you know, based on the
12 evolution of those representations.

13 If you look at my declaration on
14 paragraph 89, I think that describes it
15 clearly. You see Claim 7, it says "on the
16 other hand."

17 So if you look at the start of the
18 paragraph, it says, "Furthermore, Thomas does
19 not disclose a determination of temporal
20 correspondence of instruction sets and object
21 representations, because Thomas does not need
22 such determinations, since Thomas simply

1 associates situations in user commands at the
2 same time, when they happen to be received."

3 "Claim 7, on the other hand, relates
4 to at least a situation where a stream of
5 object representations and stream of
6 instruction sets are first stored and the
7 object representations and instruction sets are
8 correlated later, and where a determination of
9 temporal correspondence is needed for correct
10 correlation."

11 Because you have to apply the proper
12 instruction at the proper location in time.

13 Q. Would you say in that paragraph that
14 you just read from, 89, right in the middle, it
15 says "Claim 7, on the other hand, relates to at
16 least a situation." And then it goes on.

17 A. Yes.

18 Q. What other situations would Claim 7
19 relate to?

20 A. Well, you may have more than one
21 object, you know, so you have object
22 representations of a given object over time,

1 but I may have 20 objects. And each of them
2 have representations.

3 Q. How would the correlation later
4 happen? So just to focus a discussion, you
5 said you've got a stream of object
6 representations and a stream of instruction
7 sets --

8 A. Yes.

9 Q. -- that are stored. And then at some
10 point later those two things are correlated.
11 How would they be correlated?

12 A. You would correlate the object
13 representations and instruction sets based on
14 the learning.

15 Q. How would that happen?

16 A. Well, '134 describes obviously;
17 right. So if you look at -- you know, title of
18 the patent is Artificially Intelligent Systems,
19 Devices and Methods for Learning and/or Using
20 an Avatar's Circumstances for Autonomous Avatar
21 Operation.

22 So there is learning that's taking

1 place to correlate these instruction sets and
2 object representations properly.

3 Q. Sir, I'm going to ask you now about
4 Buehler Exhibit 1006. Would you turn to that,
5 please.

6 A. Yes, sir. Buehler.

7 Do we set '134 aside for now?

8 Q. Yes, sir. That would be good.

9 Buehler was assigned to a company
10 called Rethink Robotics. Have you ever heard
11 of that company?

12 A. Not particularly, no.

13 Q. Buehler describes an augmented
14 reality application; right?

15 A. Yes, generally speaking, yes.

16 Q. And an augmented reality application
17 involves some computer-generated aspects, and
18 some real-world aspects, is that agreeable?

19 A. Generally speaking, yes. It's
20 overlaying of computer generated objects upon
21 the real environment.

22 Q. And an augmented reality application

1 combines, if you will, the computer generated
2 aspects with the real-world aspects. And
3 that's -- that's just the nature of augmented
4 reality application. Is that fair as a
5 baseline understanding?

6 A. Well, as a baseline, yes. But, I
7 mean, you have to be careful of exactly what
8 combined means. It's obviously specific to
9 application. So the context is important. But
10 generally speaking, as you are overlaying
11 computer-generated objects upon some real
12 environment, you're trying to kind of fit the
13 two together.

14 Q. And Buehler's augmented reality
15 application uses some computer-generated
16 objects with some real-world objects. No
17 dispute about that; right, sir?

18 A. Well, let's be very specific. So if
19 you look at Buehler, I'm looking at column --
20 I'm looking at column 1, I'm at the last line,
21 "In training mode the robot typically" -- and
22 it goes into column 2 -- "provides information

1 about its internal state in a manner intuitive
2 to the trainer using augmented reality
3 techniques."

4 And then he refers to augmented
5 reality, as you have described, augmented with
6 computer-generated data. So real-world data
7 augmented with computer-generated data. And
8 then he gives an example there.

9 Q. Would you turn to Buehler column 18,
10 lines, say, 50 to 54.

11 A. Column 18?

12 Q. Yes, sir.

13 A. Lines 50 to 54. Okay.

14 Q. And so this is talking about the
15 detection algorithm 508 of Buehler. And it
16 says that the detection algorithm 508 compares
17 real-time camera images against the template
18 and determines, based on a similarity metric,
19 whether the real-time image contains the object
20 of interest.

21 You see that?

22 A. Yes.

1 Q. Do you understand what that means?

2 A. Well, he's -- look at the next
3 sentence. You see it says, "For example, a
4 detection algorithm may run in normalized
5 cross-correlation of the stored image template
6 with a presently acquired image, resulting in a
7 score for" -- it should say each pixel, not
8 reach pixel. So that's a typo there.

9 Q. I'm sorry; go ahead, sir.

10 A. No. Please continue.

11 Q. So -- and then based on Buehler's own
12 words here, you would agree that Buehler
13 identifies objects by comparing a captured
14 image to a stored image template; right?

15 A. Well, as you read the detection
16 algorithm 508, so this is talking, I think,
17 about Figure 4 of Buehler -- no, Figure 5 of
18 Buehler. So we are at Figure 5. So this is
19 referring to Figure 5, obviously, or in the
20 description of Figure 5.

21 So if you look, for instance, at
22 column 17, it starts at line 20 talking about

1 Figure 5. So this is in the context of
2 Figure 5, what I'm trying to say.

3 So you see it says the detection
4 algorithm 508, which you see there in Figure 5
5 labeled detection algorithm and collects,
6 obviously, censored data as input compares
7 real-time camera images which are collected by
8 that sensor data 500 on Figure 5, against the
9 template which would be part of the 506 type of
10 thing. So you have some templates there, and
11 determines, based on a similarity metric,
12 whether the real-time image contains the object
13 of interest.

14 And then it goes on to discuss, for
15 example, the detection algorithm may run in
16 normalize cross-correlation, which is a
17 standard technique of the stored image
18 template, with the presently acquired image
19 resulting in a score for each pixel.

20 So when you do a cross-correlation,
21 you're passing a template over the image, in a
22 sense. And when they line up correctly, you

1 would have a higher score than when they're
2 not.

3 And then he continues on saying,
4 "Scores above a set threshold (e.g., the
5 threshold determined by the learning algorithm
6 based on anticipated noise levels), may then be
7 clustered to determine the potential location
8 of the object of the image."

9 And then he tries to account for
10 scale variations.

11 Q. Okay. So you agree that the object
12 detection algorithm of Buehler identifies
13 objects by comparing a captured image to a
14 stored image template; right?

15 A. Yes. That's what -- that's what we
16 read; right?

17 Q. Sir, could you turn, in your
18 declaration, to paragraph 127.

19 A. 127. Yes, sir.

20 Q. In the middle of this paragraph
21 there's a clause that you have here that is,
22 "Object identification, recognition or

1 detection using image features are different
2 than matching of object representation."

3 Do you see that?

4 A. Yes, I do.

5 You read that correctly.

6 Q. How is object identification,
7 recognition or detection using image features
8 different from using matching?

9 A. Of object representation?

10 Q. Yes.

11 A. So if you can -- if you read that
12 paragraph in Buehler that we've been talking
13 about, see Buehler acquires sensory images, so
14 you have images captured by camera. Those
15 images contain objects, right. A circular
16 cylinder, a car, whatever.

17 Now, when you do the
18 cross-correlation, you're essentially looking
19 at the features in the image of the object. So
20 the object is in the image. It has features.
21 It has corners. It has edges. It's got color,
22 white here and dark there, whatever. So it has

1 features.

2 You're cross-correlating a template
3 with the image, so essentially passing a
4 template over the image, and trying to see
5 where things correlate properly, standard
6 correlation technique. And when the template
7 exactly fits on top of the image, you get a
8 high score. Because there's a very good match.

9 And obviously, Buehler is doing that
10 with scale variation, because the object and
11 image come in different scales, so you have to
12 do this correlation at various scales. The
13 object representations of the '134 is like a
14 graphical -- so if you go back at '134, if you
15 go back in my declaration -- go back to page 20
16 of my declaration, Figure 16.

17 Let me know when you're there, sir.

18 Q. I see it.

19 A. So you see in that figure -- I'll
20 just grab one of them, let's say model A, the
21 one on the top left. So you see all these
22 nodes that are interconnected with these

1 connections 853. So the nodes are 852, if you
2 read the text, and the connections are 853.

3 So these are object representation
4 that are like based on graphic graph models.
5 So you have an object like a car, and you have
6 a root node and you may have sub nodes, tires,
7 whatever you have an object representation.
8 That's not the object in the image itself
9 represented with pixels. See what I mean?

10 So matching the object
11 representations there are in a graph, kind of,
12 look like you see in Model A, it's completely
13 different. So trying to do graph matching is
14 completely different from doing
15 cross-correlation in the image points. Or
16 similarity type matching in the image plane
17 based on features.

18 Q. What is --

19 A. Very distinct differences.

20 Q. What is graph matching?

21 A. So you have an object representation,
22 as you see in Model A, so that -- or let's say

1 Model C. Look at Model C in Figure 16. You
2 see how that Model C is structured?

3 Q. I do.

4 A. So you have, essentially, like a
5 graph, or kind of a root node on top, and you
6 may have, let's say, let's call it a parent
7 node or something. You have a root node on top
8 and you have connection to sub nodes in a
9 sense. So that structure defines a graph for
10 that particular object. Because a different
11 object would have a different looking graph.
12 Those nodes have content about portions and
13 regions of the object. And they're
14 interconnected.

15 So when you're doing a graph
16 matching, you're trying to say, does the object
17 representation of X, Y, Z match this object
18 representation of A, B, C? From the graph
19 perspective, that is very different. So you're
20 matching object representation, not objects
21 that are in the image themselves.

22 So what Buehler is doing is capturing

1 a picture of the object, an image, and then
2 trying to segment or find the object in the
3 image. That is not an object representation.
4 That is just an object in the image. That is
5 distinctly the difference from the object
6 representation of the '134.

7 Q. So if Buehler has an image that,
8 let's say, there is a block in the image, and
9 it is trying to identify the block against the
10 background. Are you with me so far?

11 A. Yes.

12 Q. Buehler, you would say, does not use
13 graph matching.

14 A. Correct. And doesn't do partial
15 matching of any kind.

16 Q. And because Buehler doesn't do graph
17 matching, as you described it, it doesn't do
18 the matching as claimed by the '134 patent?

19 A. Well, you're missing a few things.
20 So you have object in Buehler being the image
21 that Buehler's system has captured, the image
22 of the block. In the '134 you have an object

1 representation that is represented like in
2 Figure 16, right? So you have an object, you
3 have represented it with the representation
4 that is shown in Figure 16. Excuse me. Shown
5 in Figure 16. So you have an object
6 representation. In the '134 you're matching
7 object representations.

8 In Buehler you're matching the object
9 to a template, to an image version of that
10 object that you have stored a priori in your
11 database.

12 So you have a car stored in your
13 database. This is what a car looks like.
14 Buehler's robot sees -- sees an object there.
15 You pass the car correlation over to see
16 whether this is a car. If it doesn't match,
17 then you may try, you know, a tree. You may
18 try some other template.

19 So the problem with that is you're
20 doing a cross-correlation and there is no
21 partial matching there, because if the object
22 is occluded or half occluded in Buehler. So if

1 the car is parked behind a garage and you can
2 only see the back end of it, that would be
3 occluded. So you would have like a partial
4 portion of the car.

5 So the system in Buehler doesn't
6 compute an object representation, as discussed
7 in the '134. Captures images of objects.
8 Doesn't have an object representation as
9 claimed in the '134, and doesn't do matching of
10 object representations. So there are very
11 distinct concepts here.

12 Q. The image, let's use the car example.

13 A. Yeah.

14 Q. The image, let's say Buehler takes an
15 image of a car.

16 A. Let's set this clear. So I have a
17 car parked in the driveway, Buehler's robot is
18 in the driveway, takes a picture of the car,
19 there's a car there, there is a garage, or
20 whatever, there's some background behind the
21 car.

22 Q. Is the car -- the car is an object,

1 and the image of the car is the representation
2 of the object. Agree or disagree?

3 A. No. I would -- I would disagree with
4 you. The car is an object. The image of the
5 car is an image. That is not the
6 representation that is in the '134 patent. So
7 the word representation in the '134 patent has
8 a meaning.

9 Q. What is that meaning?

10 A. What I just described. Like, you see
11 those -- Figure 16; right? You have an object
12 representation. That is not the same as the
13 image captured in Buehler. So what you have in
14 Buehler is an image. It's a digital image that
15 you grabbed.

16 So that image shows the scene there
17 with the object and with other things. You
18 have a garage in the background, grass and
19 trees, whatever, maybe a person standing there.
20 So that is not a representation of the object.
21 It's a digital image. It's pixels, colored RGB
22 values. That is not the graphical

1 representation of the '134.

2 Q. Let me give you an example, and I
3 want you to tell me if this is the matching
4 that would fit under the '134 patent. I think
5 you're going to disagree, but so my follow up
6 would be why you disagree. So let me get into
7 it and we'll see where it goes.

8 There could be a system that takes a
9 picture of a car sitting in a driveway with
10 trees in the background, and a mailbox, and all
11 sorts of other things.

12 A. Yes, sir.

13 Q. And the object of the system, the
14 purpose of the system is to identify the car in
15 the image.

16 A. Yes, sir.

17 Q. And I think one way that could work
18 would be to take that image, do some -- well,
19 roll that -- check that against maybe a
20 thousand other images that you have to see if
21 there is a match that determines if the car in
22 that picture is in fact a car based on some

1 previous learnings where a car has been
2 identified. Is that a match? Is that
3 comparing using the matching that is described
4 in the '134 patent or is that different?

5 A. No.

6 MR. JAIRAM: Objection, form.

7 THE WITNESS: First of all, you're
8 oversimplifying the problem significantly,
9 and, you know, I worked in this object
10 detection area extensively for many, many
11 years. And detection recognition,
12 tracking, et cetera, starting with my
13 Ph.D. work, and if you look at the first
14 four or five papers that I published in my
15 CV, you will see some stuff on shape
16 matching and whatever. It's -- I've
17 worked in this area for years.

18 So the image that you capture in that
19 the driveway, in that -- where the car
20 you're talking about with the camera.
21 That is a digital RGB image. Your eyes
22 sees a car there. The computer just sees

1 pixels. It doesn't see the car. You now
2 have to do something to bring out that
3 object. What Buehler is doing is
4 basically says, I'm going to take a
5 template of what I think a car is, this is
6 what a car looks like at a given scale.
7 Okay. The template is at a certain scale.
8 We are talking shape now. And I'm going
9 to take that template and I'm going
10 cross-correlate it, run it over the entire
11 image. I don't know if you know what
12 cross-correlation is, but basically you're
13 going to plop in the image, move it by one
14 pixel, compute, move it by one pixel,
15 compute, and do this all the way till you
16 get to the bottom; okay? That is
17 cross-correlation. And you can normalize
18 that, obviously, so you don't -- because
19 the pixel -- the cars could be red, could
20 be green; right? So you normalize it so
21 you don't have to deal with the difference
22 in color, or gray scale.

1 So when you do that, right, so what
2 Buehler is doing, is doing the
3 cross-correlation. That is done at one
4 scale. Cross-correlation is translation
5 invariant, but not scale or rotation
6 invariant. So now you have to rescale
7 that template and do it again, rescale the
8 template, do it again, until you fit the
9 scale of the image, because the robot
10 could be 10 meters away from the car,
11 could be 20 meters away from the car;
12 right? If you're 20 meters away from the
13 car, the car appears a lot smaller in the
14 image than if you're 10 meters away from
15 the car versus 5 meters away from the car.

16 Does that make sense?

17 Q. It absolutely makes sense.

18 A. So in that cross-correlation, it's
19 just cross-correlating a template with RGB
20 values in the image. When it gets a high
21 score, it will say, I think the object is
22 located here. And it looks like this shape.

1 See what I mean?

2 Q. Yeah. Let's -- let's -- go ahead.

3 Let's do it again, but let's just use a block
4 because it's -- it's simple.

5 Let's say the robot has to determine
6 objects that are either a block or a sphere;
7 okay?

8 A. All right.

9 Q. If the robot takes a picture, an
10 image of a block, it needs to determine what
11 this is. If it checked that picture for a
12 match against block pictures and sphere
13 pictures in a database, would that be matching
14 as described by the '134 patent?

15 A. No. No, it would not.

16 Q. Okay. So even though it would be
17 trying to determine a match between an object
18 -- something in an -- something in an image
19 with known shapes and prior images, and it
20 would be comparing them to determine a match,
21 that is not matching, according to the
22 '134 patent; right?

1 A. No. The '134 patent is -- first of
2 all, is matching object representations. It's
3 not the objects themselves.

4 And what you're doing in your block
5 and sphere, so if I have a block and I have a
6 sphere sitting in a driveway, and the robot
7 comes up with a camera and takes a picture of
8 that scene, for you to find the block in
9 Buehler, you're going to take a template of
10 that block and pass it over the whole image
11 you're using, say, cross-correlation. And when
12 you get a high score, you're going to say the
13 block is located here. So you have detected
14 the block at a given location in the image.

15 And you had to do the same thing for
16 the sphere. And you have to do both of those
17 at different scales because the block could be
18 at a different scale image. And potentially,
19 if it can be rotated, you would have to try
20 different rotations as well, because
21 cross-correlation is invariant to translation,
22 but not rotation or scale, or any kind of

1 shearing, like if the block is rotated in and
2 out of the image plane.

3 So that is not the matching that is
4 being described in the '134.

5 MR. COLVIN: No further questions. I
6 will pass the witness.

7 MR. JAIRAM: Let's take a break,
8 please. Go off the record.

9 MR. COLVIN: Okay. How long do you
10 want?

11 MR. JAIRAM: Can we do a 10-minute
12 break and we will be back at -- be back at
13 1:20, 8-minute break?

14 (Thereupon, a brief recess was taken.)

15 MR. JAIRAM: I do not have any
16 questions. This deposition is over.

17 (Time Noted: 1:20 p.m.)

18

19

20

21

22

1

CERTIFICATE

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

I, the undersigned authority, hereby
certify that the foregoing transcript, page 1
through 125 is a true and correct transcription
of the deposition of Eli Saber, Ph.D., taken
before me at the time and place set forth on
the title page hereof.

I further certify that said witness
was duly sworn by me according to law.

I further certify that I am not of
counsel to any of the parties to said cause or
otherwise interested in the event thereof.

IN WITNESS WHEREOF I hereunto set my
hand and affix official seal this 20th day of
June, 2024.



RANDI GARCIA, COURT REPORTER, RPR

NOTARY PUBLIC

Page 128

1 Eli Saber, Ph.D., c/o
2 McKOOL SMITH
3 1999 K Street, NW
4 Washington, D.C. 20006

5
6 Case: Tesla, Inc. v. Autonomous Devices LLC
7 Date of deposition: June 14, 2024
8 Deponent: Eli Saber, Ph.D.

9
10 Please be advised that the transcript in the above
referenced matter is now complete and ready for signature.
11 The deponent may come to this office to sign the transcript,
a copy may be purchased for the witness to review and sign,
12 or the deponent and/or counsel may waive the option of
signing. Please advise us of the option selected.
13 Please forward the errata sheet and the original signed
signature page to counsel noticing the deposition, noting the
14 applicable time period allowed for such by the governing
Rules of Procedure. If you have any questions, please do
15 not hesitate to call our office at (202)-232-0646.

16
17
18 Sincerely,
19 Digital Evidence Group
20 Copyright 2024 Digital Evidence Group
21 Copying is forbidden, including electronically, absent
22 express written consent.

1 Digital Evidence Group, L.L.C.
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646

5

6 SIGNATURE PAGE

7 Case: Tesla, Inc. v. Autonomous Devices LLC

8 Witness Name: Eli Saber, Ph.D.

9 Deposition Date: June 14, 2024

10

11 I do hereby acknowledge that I have read
12 and examined the foregoing pages
of the transcript of my deposition and that:

13

14 (Check appropriate box):

() The same is a true, correct and
15 complete transcription of the answers given by
me to the questions therein recorded.

16 () Except for the changes noted in the
attached Errata Sheet, the same is a true,
17 correct and complete transcription of the
answers given by me to the questions therein
18 recorded.

19

DATE

WITNESS SIGNATURE

20

21

22

DATE

NOTARY

1 Digital Evidence Group, LLC
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646

5

6 ERRATA SHEET

7

8 Case: Tesla, Inc. v. Autonomous Devices LLC

9 Witness Name: Eli Saber, Ph.D.

10 Deposition Date: June 14, 2024

11 Page No. Line No. Change

12

13

14

15

16

17

18

19

20

21

22

Signature

Date

A				
a.m 1:16 2:10	111:12	approaches 51:9	42:11	83:13,15 99:17
able 12:4 13:20	allowed 128:14	appropriate 41:4	assume 62:12	101:4,6,8,10,16
18:21 19:3	analysis 37:20	64:21 65:2 71:5	65:3,20 67:15	103:4 105:20
above-captioned	analyze 12:18	129:14	73:3 84:10,12	Avatar's 105:20
2:5	13:13 16:9	approximately	88:9,10 89:7	avatars 33:3,14
absent 128:21	35:18 36:14	2:10	96:21	35:17 44:12,14
absolutely 8:7,14	37:19 46:15	area 121:10,17	assuming 48:19	50:3 62:13
9:12 64:1 87:7	75:22 76:3,4,7	argue 82:10	69:9 70:18	63:11,12 64:3,4
123:17	81:13 95:18	Artificially	attached 129:16	64:10 66:22
abstract 12:12,13	96:22	105:18	attempt 9:22	67:13,17,18,22
12:21 16:3	analyzed 78:17	Arvind 3:16	52:9	73:8 74:16,22
accessible 8:1	analyzes 32:14	14:11,21 15:2	attention 41:9	75:5 76:4,12
account 111:9	46:3	aside 106:7	attorney 6:11	77:15 78:2,11
accurate 17:1	analyzing 76:10	asked 13:20	attribute 51:11	78:13 79:2,9,15
acknowledge	79:7	15:18 22:8	augmented	80:1,3 81:15,22
129:11	and/or 32:16	24:22 86:21	106:13,16,22	83:20
acquired 109:6	38:5 39:7,12	asking 6:12 8:10	107:3,14 108:2	
110:18	40:12,14 46:4	8:20 20:7 30:14	108:4,5,7	B
acquires 112:13	54:5 105:19	42:19,21 43:7,8	authority 127:3	B 6:1 115:18
action 22:4 46:17	128:12	48:11 51:14	Autonomous 1:8	back 10:19 15:20
58:9 71:5 80:9	answer 8:19 9:1	52:18,20 66:14	105:20 128:6	19:1 22:15,20
actions 70:19,21	9:10 24:16,17	74:11,13 92:14	129:7 130:8	23:21 24:1 27:8
activate 83:14	36:18 39:3	92:15,15	avatar 35:14	27:17,18 28:1
84:5	53:21 56:11	102:11	39:19,21,22	31:11,11 36:7
actual 35:22	82:12	aspects 106:17	40:2,3,4 47:4,6	49:14 68:11
advisable 90:2	answered 36:20	106:18 107:2,2	47:13,16 48:1	69:15 89:19
advise 128:12	82:7	assess 78:15	48:15,16,18,21	113:14,15,15
advised 128:10	answering 8:18	assigned 106:9	49:1,2,19,21,22	118:2 126:12
affix 127:15	answers 8:21	associate 18:1,21	50:2,4,5 53:13	126:12
agnostic 86:5	129:15,17	19:14 57:4	62:14,17 63:2,2	background
ago 102:5	anticipated 111:6	88:14,15	63:5,6,8 64:11	116:10 118:20
agree 13:1 15:21	apologize 25:12	102:12	65:7,9,9,10,11	119:18 120:10
33:5 41:21 55:3	60:17 85:12	associated 7:10	66:22 67:4,9,10	bake 63:22
58:20 62:15	apologized 60:20	18:12 19:3,4,19	67:15 68:4,15	ball 36:7 41:8
71:8 72:1 87:4	APPEAL 1:3	19:21 30:3	68:16,18,18,22	48:22 66:20
95:3 109:12	appears 123:13	40:18,22 41:19	69:2,3,4,7,10	68:2,4 69:4
111:11 119:2	apples 44:7	42:7 43:13,21	69:13,16 71:12	70:9 71:7,11
agreeable 106:18	applicable	47:14 55:22	72:19 73:7,8,12	72:3,7 79:12
ahead 67:6 109:9	128:14	56:7,14 57:8	73:14,20 74:19	80:6 88:8,12
124:2	application 99:17	61:18 92:18	74:20 75:2,2,5	90:8,8
ajairam@mck...	101:5,7,16	102:4,6,7	76:1,1,5,10,19	baseball 34:18
3:20	103:5 106:14	associates 17:15	76:20 77:7	based 39:8 42:3
algorithm 108:15	106:16,22	18:3,3,4 75:16	78:14,14,14	49:16 50:8,22
108:16 109:4	107:4,9,15	77:4 104:1	79:3,8,10,14	54:5 55:1,17,21
109:16 110:4,5	apply 42:13	association 18:5	80:4,5,6,20,20	65:15 83:20
110:15 111:5	104:11	18:7,11,16	81:2,3,4,14	84:5 97:4
	appreciate 36:18	associations	82:17 83:4,6,7	103:11 105:13

108:18 109:11 110:11 111:6 114:4,17 120:22 baseline 20:11 107:5,6 basically 18:10 18:14 23:20 26:4 31:2 38:9 50:10,21 62:14 71:21 93:4 122:4,12 basket 89:6 94:11 95:6 basketball 34:18 60:15,17,18,19 60:21 62:11,20 66:9 68:20 70:21 85:13,15 85:18 86:9,11 89:20 baskets 94:13 bear 8:6 becoming 85:14 BEHALF 3:2,15 behaves 33:1,11 believe 15:18 60:12 best 62:20 beyond 65:19 66:21 67:11 68:3,5 70:1 72:3 73:22 binary 84:18 88:6 97:11 binder 7:17 bit 25:14 28:1 33:18 blitzing 23:15 24:7 25:5 59:17 block 21:17 29:17 58:5 116:8,9,22 124:3,6,10,12 125:4,5,8,10,13 125:14,17 126:1	blown 29:12 blowup 29:10 BOARD 1:3 bolded 101:13 bomb 22:14,20 23:18,20 24:5 25:3 60:2 bottom 26:7 32:2 122:16 box 31:5 129:14 break 9:7,11 11:12 60:5 98:2 98:2 126:7,12 126:13 breaking 22:15 22:20 24:1 breaks 9:6 58:7 brief 60:6 98:3 126:14 bring 10:18 122:2 bucket 92:4,6,9 96:14 97:3 Buehler 11:5,8 15:5,5 106:4,6 106:9,13 107:19 108:9 108:15 109:12 109:17,18 111:12 112:12 112:13 113:9 115:22 116:7 116:12,16,20 117:8,22 118:5 118:14 119:13 119:14 122:3 123:2 125:9 Buehler's 107:14 109:11 116:21 117:14 118:17 Bueler 5:7 build 90:15 bunch 26:9,11 35:16 C C 3:1 29:19 115:1	115:1,2,18 c/o 128:1 call 26:12 30:18 55:10 115:6 128:15 called 2:4 23:19 106:10 calls 30:6 camera 108:17 110:7 112:14 121:20 125:7 capture 121:18 captured 109:13 111:13 112:14 116:21 119:13 captures 17:7 118:7 capturing 63:7 115:22 car 112:16 114:5 117:12,13,15 117:16 118:1,4 118:12,15,17 118:18,19,21 118:22,22 119:1,4,5 120:9 120:14,21,22 121:1,19,22 122:1,5,6 123:10,11,13 123:13,15,15 care 14:10 careful 52:15 53:1 57:12,17 62:19 102:14 107:7 cars 122:19 case 1:11 46:7 48:21 51:1,4,18 59:20 83:3 91:5 94:6 128:6 129:7 130:8 cause 127:12 censored 110:6 center 68:5 certain 33:1,2,11 33:12 34:5,5	36:12 56:1,15 62:13 74:5 87:10 122:7 certainly 8:4,19 CERTIFICATE 127:1 certify 127:4,9,11 cetera 21:18 29:16 56:8,8 59:17 121:12 chance 8:4 98:11 chances 36:7 change 103:11 130:11 changes 129:16 chat 7:6 10:1,7 15:9 check 120:19 129:14 checked 124:11 choice 102:14 circular 112:15 circumstance 22:21 24:5,11 25:3 36:12 52:7 52:10 53:10,13 58:15,16,20 63:4 65:5,16 66:1,2,18 69:12 74:3,6 77:5 80:13 83:14 91:10,11 96:11 circumstances 12:19 13:14 16:10 17:17 18:2,18 19:4,18 19:19,21 22:6 23:3,6,7 25:21 30:3 33:2,12 42:7,10 43:21 56:1,11,15 57:6 57:8,14,15 58:2 58:12 59:2,4,20 61:19 63:7 65:6 73:10,15 74:1 74:15,18 77:13 79:1 80:22 82:2	87:20 89:2 90:15 91:12,14 92:18,22 93:1,4 94:20 102:5,6,7 105:20 Civil 2:7 claim 34:5 57:17 98:17,19,20 99:2,6,11,13 100:22,22 101:13 103:15 104:3,15,18 claimed 116:18 118:9 claims 34:5 100:21 clarification 49:6 63:9,17 clarify 46:22 58:19 clause 111:21 clear 20:17 54:2 64:1 66:14 73:1 73:19 87:7 96:10 118:16 clearer 87:9 clearly 59:9 103:15 clicked 14:15 clock 20:3 22:22 24:6 25:4 35:3 35:12 36:5,11 37:13 46:16 51:8 58:17 59:7 59:10 close 79:9 89:17 closing 68:18 clustered 111:7 coach 85:15 coached 34:22 coffee 9:8 collected 110:7 collects 110:5 color 112:21 122:22 colored 119:21 column 17:8,18
---	---	---	---	---

21:3,6,8 23:4 25:20,20,21 26:3,6,7,17,22 27:11 28:8 30:22 31:20 32:2 34:15 35:2 37:10 39:2 40:10 41:9,12 43:10 45:1,10 45:13 47:1,22 49:15 54:1,17 56:19,21 57:19 60:11 61:1 68:11 73:1 85:20 86:17,19 95:13 98:18,20 107:19,20,22 108:9,11 109:22 columns 26:16 27:22 Colvin 3:3 4:7 6:5,7,11 10:5 11:2 13:22 14:2 14:7,9,17 15:1 15:7,10,15,16 31:7 42:20 49:9 52:3 53:5 60:3 60:7 66:15 82:8 96:18 97:19,22 98:6 126:5,9 colvin@fr.com 3:7 combined 107:8 combines 107:1 come 8:5 113:11 128:11 comes 125:7 coming 40:1 49:1 50:5 82:17 commands 104:1 commencing 2:10 communicate 7:5 company 106:9 106:11 compares 108:16	110:6 comparing 109:13 111:13 121:3 124:20 complete 128:10 129:15,17 completely 24:20 93:18 114:12 114:14 comprehends 59:19 compute 118:6 122:14,15 computer 10:10 12:17 13:6,12 16:5,6,8 20:4 31:12 32:7 35:10 41:15 45:20 46:3 106:20 107:1 121:22 computer-gene... 106:17 107:11 107:15 108:6,7 conceivable 93:20 94:4 conceivably 95:7 concepts 118:11 configured 12:16 13:11 16:4 17:10 56:20,22 connect 101:22 connection 101:19 115:8 connections 114:1,2 consent 128:22 considered 100:16 contain 112:15 contains 21:20 44:17 108:19 110:12 content 115:12 context 18:8 21:9 35:5 47:19 52:22 57:13,14	57:16,17 74:7 107:9 110:1 contexts 52:17 continue 11:13 15:12 39:15 40:20 109:10 continues 32:21 46:5 111:3 control 33:3,13 controlled 67:13 67:16 controlling 44:14 67:3,8,19 controversial 76:15 conversely 90:16 copies 7:14,15 13:17 copy 7:9,13,16,18 7:19 11:3,4 12:2,4,5 14:5 14:22 128:11 Copying 128:21 Copyright 128:20 corners 112:21 correct 11:21 24:19 25:7 33:15 41:17 64:6,12 67:14 67:17 68:21 86:18 87:15 88:9 96:19 104:9 116:14 127:5 129:14 129:17 correctly 67:13 76:21 77:2 95:21 96:3 110:22 112:5 correlate 101:2 102:12,16 105:12 106:1 113:5 correlated 104:8 105:10,11 correlating	101:10 correlation 102:17,20 104:10 105:3 113:6,12 117:15 correspond 99:17 101:17 103:5 correspondence 100:7,19 103:7 103:20 104:9 counsel 7:5,16 127:12 128:12 128:13 couple 28:8 court 90:1,6 127:21 courtroom 9:15 coverage 78:15 93:7 95:19 97:2 97:4 covered 63:6 73:13 75:2,4 76:2,6,11,20 77:15 78:2,11 79:2 80:1,3 81:3,15,22 83:20 84:14,19 87:21 88:6,10 88:15,20,21 92:4,7,9 93:5 94:1,3 95:6 96:7,14 created 45:22 creates 32:5 criteria 77:14,19 77:22 78:5,9,16 79:1,18,20,22 80:7,13 81:16 81:17 82:2 83:19 85:2 96:1 cross-correlate 122:10 cross-correlating 113:2 123:19 cross-correlation	109:5 110:16 110:20 112:18 114:15 117:20 122:12,17 123:3,4,18 125:11,21 curious 20:15 current 12:19 13:14 16:9 17:16 42:12 52:7 53:10,12 57:5 63:4 65:6 73:10 74:18 77:13 78:22 80:13,22 82:2 87:20 92:21,22 93:3 cut 24:17 CV 121:15 cylinder 112:16 D D 4:1 D.C 1:21 128:4 129:3 130:3 Dallas 3:6 dark 112:22 data 16:15,17,18 16:19,20,21 17:5,14,15 18:1 18:4,5,9,12,14 18:17,20 19:1 19:11,14,17,20 19:22 20:20 25:9,13,18,22 26:4,14 27:19 28:3,3,7,10,12 28:18,20 29:18 29:22 30:2,2 40:18 41:19 42:3,6,11 43:13 43:16,20 44:2 44:18,18 49:17 50:8,9,16 51:1 51:3 55:2,3,4,7 55:10,12,14,15 55:18,18,19,20
---	--	--	---	---

55:22 56:6,14 57:3,4,7 61:18 62:2,9,16 64:19 64:22 70:2,6,8 70:9,11,16 71:2 71:9 72:5 87:17 90:15 91:8 92:17 93:16 94:10 108:6,6,7 110:6,8 database 25:19 27:22 31:13 117:11,13 124:13 Date 128:7 129:9 129:19,22 130:10,22 day 127:15 DC 3:19 deal 122:21 decide 65:18 83:15 decision 32:20 75:12,14 decisions 71:21 declaration 5:5 7:10 10:7 11:4 14:22 20:7,15 20:16 30:11,12 30:14 33:20,21 34:1,4,7 42:17 42:18 43:1,6,7 48:9,10 52:20 74:10,12 99:8 101:14 103:13 111:18 113:15 113:16 default 38:6 41:6 84:9 defender 51:8 defenders 72:20 defensive 29:15 59:11 95:19 97:2,4 define 79:18,20 80:7 defined 26:9,13	32:17 77:20 81:17 defines 115:9 dependence 101:1 depends 100:22 deponent 128:8 128:11,12 deposition 1:14 2:3,6 7:6 8:1 85:16 126:16 127:6 128:7,13 129:9,12 130:10 derailed 15:19 describe 11:19 29:18 58:15 78:2,6,8 described 27:21 41:22 42:22 43:17 44:1 55:5 77:11 85:20 100:3 108:5 116:17 119:10 121:3 124:14 126:4 describes 11:15 21:19 22:4 31:21 41:14 61:5 103:14 105:16 106:13 describing 31:2 55:4 100:18 description 5:3 28:6 109:20 designed 74:3 desires 45:18 desperation 23:22 detail 78:16 detected 125:13 detection 108:15 108:16 109:4 109:15 110:3,5 110:15 111:12 112:1,7 121:10 121:11	detects 12:10 96:12 determination 99:15 101:14 103:19 104:8 determinations 103:22 determine 35:19 36:15 85:2 111:7 124:5,10 124:17,20 determined 111:5 determines 108:18 110:11 120:21 determining 80:12 82:1 developed 50:16 50:16 52:1 developing 93:16 Devices 1:8 105:19 128:6 129:7 130:8 DeVries 3:9 devries@fr.com 3:13 diagram 21:17 29:18 58:5 difference 116:5 122:21 differences 114:19 different 43:6 52:17,21,22 57:16 64:10 66:10 102:13 112:1,8 113:11 114:13,14 115:10,11,19 121:4 125:17 125:18,20 difficult 8:22 difficulties 8:5 difficulty 13:19 digital 1:20 100:14 119:14	119:21 121:21 128:19,20 129:1 130:1 dip 89:19 direct 41:8 98:17 disagree 82:9 94:1 119:2,3 120:5,6 disclose 103:19 discloses 13:2 discuss 110:14 discussed 34:4 42:9 55:5 58:4 118:6 discussing 35:9 47:8 discussion 35:5 46:6 61:15 103:1 105:4 dispute 107:17 distance 78:13 94:7,10 distinct 114:19 118:11 distinctly 116:5 distribution 54:11 document 98:10 doDiveTackle 26:10,21 27:7 doing 6:9 8:3 39:14 113:9 114:14 115:15 115:22 117:20 122:3 123:2,2 125:4 downloaded 15:11,14 downloading 14:20 98:12 Dr 6:6 98:7,14 driveway 118:17 118:18 120:9 121:19 125:6 drop 8:11 10:7,9 duly 6:2 127:10	E E 3:1,1 4:1 6:1,1 e.g 77:14 78:1 79:1 81:21 83:19 111:4 earlier 30:4 42:9 44:1 57:21 58:5 61:16 68:10 93:13 ease 26:19 easier 14:5 edges 112:21 either 124:6 electronic 7:13 7:15,18 13:17 14:5 electronically 128:21 elements 34:6 Eli 1:15 2:4 4:3 127:6 128:1,8 129:8 130:9 embodiment 28:13,19 encounter 50:17 50:18,20 encountered 50:15 54:12 encounters 40:1 47:5 50:1 engineer 25:13 enhance 87:2 entire 94:14 122:10 environment 64:14 106:21 107:12 envision 91:8 envisioning 25:18 errata 128:13 129:16 130:6 Esq 3:3,16 essentially 26:12 28:15 29:10 47:12 50:7 58:6 78:12 79:19
---	--	---	---	--

83:8 90:14 91:9 94:9 100:6 112:18 113:3 115:4 establish 91:6 established 91:3 91:19 establishes 32:6 establishing 90:20 et 21:18 29:15 56:8,8 59:17 121:12 event 18:6,10,13 18:21,22 19:2,4 19:5,9,16 20:2 21:2 22:4,6,13 22:19 23:3,6,8 23:17 24:4,12 24:13,14 25:2 27:3,12 32:16 37:5 38:5 39:7 39:12 40:2,12 40:17,19 47:22 52:8 54:5 58:9 58:12 59:3 61:5 61:22 62:6 71:15 73:2 75:10,20,20,21 77:6 80:17 81:1 81:8,12,13 82:16 83:3,15 83:18 87:5,5,8 88:13 93:2 95:18 96:13,21 96:22 127:13 events 12:1,9,18 12:20 13:4,9,13 13:15 16:1,9,11 16:14 17:12,13 17:16 18:1,12 18:17 19:8,15 19:19 20:19 21:17,21 22:2 25:20 27:5,6,16 30:3 34:12 37:2 37:8 38:16,21	39:13 40:8,14 40:15 41:16,19 43:14 46:4 56:6 56:8,11 57:2,5 61:19 90:17 everybody 94:16 everybody's 87:2 Evidence 1:20 128:19,20 129:1 130:1 evolution 103:12 evolve 102:2 evolving 103:10 exact 28:5 38:19 53:18 54:14,16 81:12,13 92:12 exactly 29:19,22 66:11 77:21 78:3 92:13 94:16 107:7 113:7 Examination 2:4 4:5 6:4 examined 6:2 129:12 example 21:1,13 22:7,9,16,18 23:9 26:17 27:3 31:22,22 34:14 37:12 39:17,20 45:8 46:7,18,21 47:3 48:13,18 49:11,12,19,20 51:2 53:15 54:7 55:9 58:19 59:5 59:21 60:10 61:21,22 62:5,6 65:12 67:8,21 68:9,12,14 69:21 70:4 71:6 72:2,14,18 73:17,20 74:14 77:8,9,22 78:5 78:10 81:9 82:15 84:11 85:12,13,20,22 86:3,4,22 87:4	88:17 92:2 93:22 96:4 97:12,16 108:8 109:3 110:15 118:12 120:2 examples 20:19 21:7 60:9 73:18 86:15,16 87:1 97:13 excuse 19:9 68:17 78:7 117:4 exhibit 5:3,5,6,7 5:8 10:3,6,8,20 10:22 11:7,8 98:4,7,15 106:4 exhibits 5:1 7:10 10:1 15:19 experiences 48:7 50:14 experiencing 53:14 Explorer 10:18 11:11 express 128:22 extensively 121:10 eye 93:19,19 eyes 121:21 F fact 120:22 fails 46:12 fair 12:1 34:19 52:11 66:16 67:20 74:2 84:16,17,20,21 88:17 89:8,8 102:9,21 107:4 fairly 34:16 fake 27:14 32:19 58:10 85:19 86:7 87:5,8 88:2,7,11,13,15 88:16,21,21 89:17 90:3,17 90:19 91:6,13	91:15 92:5,7,9 93:1,10 94:2,3 94:8,21 96:2,6 97:8,12,18 faked 90:13 93:10 94:18 95:9 96:17 97:6 97:17 fakes 87:14,19 88:19 90:16 91:12,19 92:21 95:4 familiar 34:16,17 34:21 62:11 far 29:6 116:10 features 112:1,7 112:19,20 113:1 114:17 Federal 2:6 feel 41:7 42:16 feet 92:3,6,8 94:1 94:2 95:5,10 96:7,13 97:3,16 field 18:4,9,12,20 19:1,20,22 22:13 23:13 24:8,12 25:6 35:20 36:4,6,16 37:21 38:13 42:11 55:12,14 55:15 56:2,16 57:10 58:22 59:8,15,22 61:18 62:2,16 70:6,8,9 71:10 72:5 81:10 87:17,22 89:11 90:10,12 91:1,1 93:8 94:12 fields 16:16,17,19 16:20,21 17:14 17:15 18:1,6,14 18:17 19:11,14 19:17 20:20 25:10 30:2,2 40:18 41:19 42:3,6 43:13,16	43:20 44:18 49:17 50:9,9,16 51:1,3 55:2,3,4 55:8,10,18,18 55:22 56:6,14 57:3,4,8 62:9 64:19,22 70:2 70:11,16 71:2 90:15 92:17 figure 21:13,15 21:16,22 28:9,9 28:11,17,21 29:4,5,6,11,12 29:13 31:1,5,9 31:11,12 35:7 58:4,6 109:17 109:17,18,19 109:20 110:1,2 110:4,8 113:16 113:19 115:1 117:2,4,5 119:11 figures 28:9 31:3 File 10:17 11:11 files 15:14 find 14:6 18:13 116:2 125:8 fine 6:9 13:22 15:1 finish 8:17,19 9:1 53:21 finished 9:1 first 6:2 10:6 26:18 34:9 45:18 46:13 60:9 61:10 66:7 84:1,7 99:15,16 99:18 101:2,3,4 101:15,16,17 103:2,3,4,6 104:6 121:7,13 125:1 Fish 3:4,10 fit 107:12 120:4 123:8 fits 113:7 five 35:14,17
--	---	---	---	--

36:3 37:15,18 51:8 67:13,17 102:5 121:14 five-points 36:14 flags 55:19 Floor 3:11 fluent 86:16 focus 105:4 follow 120:5 following 36:19 follows 6:3 football 22:10,13 23:10,13 34:17 34:21 36:1 46:8 59:8,15 68:9,13 69:2 70:4,7,13 73:17 77:7,9 82:14 85:22 86:3,4,8,12,14 86:15,16 89:20 forbidden 128:21 foregoing 127:4 129:12 form 30:20 42:14 51:12 52:12 66:5 82:5 96:15 121:6 format 13:20 formation 58:18 59:11 forth 19:1 89:20 127:7 forward 11:10 96:5 128:13 four 70:19 121:14 fourth 38:11 46:14 frame 100:15,16 100:16 frames 100:14 Friday 2:9 front 9:15 98:15 fully 9:10 further 17:9 56:20,22 87:2 126:5 127:9,11	Furthermore 103:18 G game 22:10,11 23:10,11,12 31:16,18 34:16 34:21 41:8 44:19 46:8 48:20 59:21 62:12,22 66:8 66:19 67:14 70:12,13,21 74:4,5,7 75:6 77:7 79:6,19 80:9,9 81:18,19 83:11 94:14,15 games 36:1 garage 118:1,19 119:18 Garcia 1:19 2:8 127:21 general 17:4 generally 11:17 11:18 33:15 34:9 61:20 64:20 102:21 106:15,19 107:10 generate 38:6 generated 106:20 107:1 getting 36:7 give 12:11 20:18 21:8 39:16 53:7 55:9 65:12 84:8 97:19 120:2 given 38:4,4 47:7 55:8 67:14,16 80:4 96:4 104:22 122:6 125:14 129:15 129:17 gives 22:7 23:9 31:21 58:6,18 59:21 77:22 108:8	giving 29:17,19 go 6:17 9:4,7 14:10 15:1 31:11 36:2 39:2 51:7 54:18 66:12 67:5,5,20 68:10 109:9 113:14,15,15 124:2 126:8 goal 35:20 36:4,6 36:16 37:21 38:13 goes 32:1 95:22 104:16 107:22 110:14 120:7 going 6:12 8:15 9:19,22 10:6 11:10,12 12:2 14:13 15:17 18:10,11 24:21 26:7 27:8 30:10 31:3,21 34:11 35:10 36:9 37:1 37:4,19 38:9,11 38:13,18 39:15 40:6,6 48:5 49:3 50:3 52:5 54:16 55:20 60:3 65:8,10,12 65:18 73:4 76:15 79:3 82:18 83:13 84:11 85:12,15 86:20 88:20,22 89:1,6,9,10 91:6 93:6,7 94:17,19 97:2,5 97:7,17,22 98:17 99:14 106:3 120:5 122:4,8,9,13 125:9,12 good 6:6,7 22:16 37:12 89:19 106:8 113:8 governing 128:14 grab 113:20	grabbed 73:3 119:15 graph 114:4,11 114:13,20 115:5,9,11,15 115:18 116:13 116:16 graphic 114:4 graphical 113:14 119:22 grass 119:18 gray 122:22 Great 99:12 greatly 62:10 green 122:20 Gretchen 3:9 ground 6:17 Group 1:20 128:19,20 129:1 130:1 guess 47:18 86:8 89:19 90:2 93:19 95:2 H Hail 22:15 23:19 half 29:5 80:5,6 89:15 117:22 hand 103:16 104:3,15 127:15 happen 96:14 104:2 105:4,15 happened 35:22 happening 20:13 24:12 happens 8:12 33:17 61:10 80:14 85:9 hard 7:14,16 12:5 head 8:9 25:14 hear 8:12 heard 106:10 help 38:13 hereof 127:8 hereunto 127:14	hesitate 128:15 hide 41:8 high 63:1 113:8 123:20 125:12 higher 27:18 111:1 histogram 47:20 48:4 70:16 84:2 84:4,6 91:7 93:12,16,21 94:6,7,9 95:3,8 95:11 hold 78:19 80:10 home 7:3 hopeful 86:22 hour 9:4 60:4 hourglass 10:11 I I-Formation 44:20 i.e 38:1 identification 10:4,21 11:1 98:5 111:22 112:6 identified 121:2 identifies 32:15 40:17 109:13 111:12 identify 116:9 120:14 image 108:19 109:5,6,14,14 110:12,17,18 110:21 111:8 111:13,14 112:1,7,19,20 113:3,4,7,11 114:8,15,16 115:21 116:1,3 116:4,7,8,20,21 117:9 118:12 118:14,15 119:1,4,5,13,14 119:14,16,21 120:15,18
--	--	--	---	---

121:18,21 122:11,13 123:9,14,20 124:10,18 125:10,14,18 126:2 imagery 79:7 images 108:17 110:7 112:13 112:14,15 118:7 120:20 124:19 Imagine 66:18 important 24:1 53:18 107:9 include 24:5 25:3 56:1,15 57:9 58:21 included 74:14 including 128:21 INDEX 5:1 indicate 10:11 information 64:18,19,21 65:2,4 69:13 71:4 79:15 81:7 87:16 91:7,20 92:16 93:11 107:22 input 19:9,13,14 31:15,18 38:2,8 40:22 41:4 42:13 45:9 46:19 48:6,13 49:11,15 55:21 61:17,17 62:1,8 71:9 72:4 110:6 inputs 12:1,9 13:3,7,8 15:22 16:7,12,15,21 17:10,12,14 19:3,7,11 20:20 25:20 30:1 39:9 42:2 43:21 44:4 44:10,13,15,19 45:2,5,7 54:6 55:1,17 57:1,3	instance 27:7,10 28:7 34:14 109:21 instruction 100:19 101:4,7 101:9,11,15,20 101:22 102:4,7 102:9,18 103:2 103:4,8,10,20 104:6,7,12 105:6,13 106:1 instructions 99:16 Intelligent 105:18 interact 45:19 interacting 31:15 31:18 32:7 interaction 12:17 13:6,11,12 16:6 16:7 32:14 interactions 16:5 16:13 interconnected 113:22 115:14 interest 108:20 110:13 interested 127:13 internal 108:1 introduces 99:2 intuitive 108:1 invariant 123:5,6 125:21 invention 17:7 28:14,20 invoke 39:7,11 40:11,13,15 41:5,6 42:2 45:1,5,6 54:4 55:20 56:8 77:13 78:19,20 78:22 81:16 85:2 96:2 invoked 41:1 49:16 invokes 55:16 involves 106:17	IPR2023-01055 1:11 J J 1:19 2:8 Jairam 3:16 13:16 14:13 15:3,8 30:16,19 42:14 51:12 52:12 66:5 82:5 96:15 121:6 126:7,11,15 judge 9:16 juke 47:13,14 48:16,16 49:3 50:11 51:9 54:10 55:15 91:2,4 juked 48:3 50:20 51:21 69:10 70:14 71:13 83:2 88:3 jukes 71:15 juking 40:6 49:2 90:22 93:13 jump 88:12 June 2:9 127:16 128:7 129:9 130:10 jury 9:16 K K 3:18 128:3 keep 52:14,18 kick 35:20 36:6 36:16 37:20 kids 34:22 kind 15:19 18:19 20:10 21:16 27:21 29:16 48:3 58:6 70:16 98:1 107:12 114:11 115:5 116:15 125:22 know 6:16 8:13 8:22 9:8 10:9 12:14 14:9	15:10 20:4 24:1 24:13 26:9,10 27:4,8,10,13 29:21 30:1 32:18 34:3 36:4 38:12 40:5 41:3 44:4,18,21 47:21 48:7,14 48:16,19 49:2,3 51:13,15 58:15 59:11,20 60:1 62:10 63:1,10 63:14 64:3,8,9 64:10,11,13,15 64:15 65:10 71:5,21 72:18 74:5,20,21,21 75:3,3,4 76:9 76:11 78:4,13 78:18 79:16 81:9,20 83:10 84:5 87:1 89:1 89:5,10,11,13 89:15,22 90:1,7 91:3 93:6,8 94:8,12,13,16 94:17 95:7 97:2 97:14 100:5 103:11 104:21 105:17 113:17 117:17 121:9 122:11,11 knowledge 60:21 79:19 84:2,4,6 85:17 known 124:19 knows 75:6,12 79:5,7,8,10,21 80:2,3 89:10,11 89:13 90:5,9,9 90:10 91:18 93:9 L L 6:1 L.L.C 129:1 label 29:8	labeled 28:12,22 110:5 labeling 29:3 language 52:15 53:17,18 54:2 54:20 56:4 57:12,13,18 62:18 languages 52:16 law 127:10 learn 80:18 learned 32:10,18 33:1,3,13 51:16 51:18 52:8,10 82:3 83:21,22 84:8,13,22 85:9 90:6 learning 11:15 11:19,22 12:8 12:15 13:3 15:22 16:3 17:4 24:3 25:1 30:7 30:18 31:4 32:10 43:18 50:13 51:16 55:6 61:11,16 61:17 62:21 63:15,18 64:2 64:18 65:15 67:2 70:2 71:20 72:14 73:5 76:13,17 80:14 82:3 83:9,10,21 83:22 85:14 87:10 88:14 97:5 105:14,19 105:22 111:5 learnings 121:1 learns 33:10 leave 30:7 left 19:13 22:11 22:12 23:11,12 35:3,12 36:5,11 37:13 40:6 46:15 47:9,17 47:18 48:2,17 49:7 50:13,18
--	---	---	---	--

50:19 51:7,9,10 51:19,22 54:9 54:13 55:11,12 59:6,21 69:8 70:8,13 71:17 82:22 88:4 91:2 113:21 left-hand 26:16 26:22 legal 48:20 69:9 length 43:1 let's 11:14 21:3 25:9 26:12 33:16 34:13,15 36:2 38:2,22 48:17 49:7 50:4 51:5 54:14 55:9 55:10 60:4 62:19 63:16 65:20 72:22 73:3 84:10,12 85:19 86:10,13 90:21 96:21 98:2 100:10 103:3 107:18 113:20 114:22 115:6,6 116:8 118:12,14,16 124:2,2,3,3,5 126:7 level 27:18 levels 111:6 life 36:1 limitations 74:6 limited 60:21 line 17:19 21:8 22:3 23:4 26:18 27:11 30:22 32:3,13 34:15 35:2,6 37:10,11 39:2,20 40:10 40:21 41:12 43:10 45:11,13 46:7,12 47:2 56:21 58:8 60:11,22 61:1,4 65:19,21 66:21	67:11 68:3,6 69:14 70:1,10 72:4,11 73:2,6 73:22 74:18 75:19 76:16 77:12 80:16 83:5 85:21 86:17,19 87:6 95:14 98:21 99:3 107:20 109:22 110:22 130:11 linebackers 59:17 lines 17:8 41:9 44:22 45:1 47:1 47:21 49:15 54:18 56:19 57:20 68:11 108:10,13 listed 26:18 little 8:21 9:5,5 27:18 28:1 66:12 92:1 LLC 1:8 128:6 129:7 130:1,8 located 79:9,11 79:13 99:6 123:22 125:13 location 58:17,21 64:10 65:8 72:19,20 79:14 80:2 87:21 89:4 89:13,22 90:5,9 90:11 93:6,8 94:12,18,19 95:18 96:16 97:1 104:12 111:7 125:14 locations 75:7 78:12 79:21 logical 29:17 long 22:14,19 23:18,20,20 24:4 25:2 45:9 46:20 48:12 49:10 60:2 73:6	126:9 look 8:10 12:6,12 12:13 17:6 21:3 21:6 22:3,9 26:1,5,6,17 27:7,10 28:8,20 29:3,4 30:21 31:12,20 34:13 34:14,15 35:5 37:9,22 39:19 45:10 47:21 49:20 56:4,18 60:8,10,13 75:19 76:3 78:21 79:3 80:15 83:13,13 85:4,11,19 93:21 94:19 97:3 103:13,17 105:17 107:19 109:2,21 114:12 115:1 121:13 looked 57:20 looking 12:14 17:8 40:13,20 43:9 76:9 78:12 89:2 92:22 93:3 99:7 100:13 107:19,20 112:18 115:11 looks 117:13 122:6 123:22 losing 35:14,17 36:3,13 37:15 37:18 38:12 lost 33:9 lot 123:13 low 63:1 lowly 25:12 M M 1:21 129:2 130:2 mailbox 120:10 Main 3:5 making 69:19	manner 108:1 manufacture 53:3 mark 46:13 marked 10:3,20 10:22 98:4 Mary 22:15 23:19 match 113:8 115:17 117:16 120:21 121:2 124:12,17,20 matching 112:2,8 114:10,13,16 114:20 115:16 115:20 116:13 116:15,17,18 117:6,8,21 118:9 120:3 121:3,16 124:13,21 125:2 126:3 Matt 6:11 13:16 matter 2:5 6:12 86:6 128:10 Matthew 3:3 McKool 3:17 128:2 mean 11:18 16:17 17:22 20:9,14 26:4 30:9,9 33:20 34:13 45:4 48:8 49:12,19 52:13 53:16 57:11 59:12,18 62:10 63:14 64:14,21 65:2 71:11 72:16 74:9,17 75:18 76:15 77:18 80:15 87:18 88:10,18 89:9 92:19 95:8 97:11 100:21 107:7 114:9 124:1 meaning 52:21	119:8,9 means 78:5 99:22 102:12,19 107:8 109:1 mechanical 25:12 meet 6:15 77:13 77:18 78:4,8 79:1,22 81:15 81:16 82:2 meeting 85:1 meets 77:21 80:13 83:18 mentioned 13:18 16:2 messages 7:6 met 6:10 96:1 meter 80:6 81:6 89:16 meters 89:5 90:7 93:9 123:10,11 123:12,14,15 Methods 105:19 metric 108:18 110:11 middle 27:9 29:6 104:14 111:20 mind 13:21 mindful 8:15 minute 99:4 minutes 20:3 22:11 35:4,13 36:5,12 37:14 51:7 59:10 98:1 102:5 misnumbering 21:21 missing 116:19 misunderstand... 54:19 mix 57:17 mixing 44:6 52:16 mode 11:15,16 11:19,20,22 12:8,16 13:3 15:22 16:3 17:4
---	---	---	--	--

24:3 25:1 30:7 30:18 31:4 32:8 32:9,11 33:18 34:10 35:7,10 36:22 37:7 38:15,20 39:4 40:7 43:18 44:5 44:9,15 45:15 54:3 55:6 61:11 61:12,16,17 62:21 63:15,16 63:19 64:2,18 65:15 67:2 70:3 71:3,20 72:14 73:5 76:13,17 77:10,11 80:18 81:11 82:4 83:9 83:12,21 84:1 87:10 88:14 95:12,16,17 96:9,12,20 97:5 107:21 model 113:20 114:12,22 115:1,1,2 models 114:4 moment 12:11 80:10 97:19 monitor 8:8,10 12:16 13:11 16:4 41:15 95:17 96:21 monitoring 13:5 37:3,4,8 38:15 38:21 39:12,13 monitors 32:13 34:11,11 37:1,2 40:8 46:2 morning 6:6,7 motion 101:22 mouth 65:3 move 19:13,13 47:9,9 122:13 122:14 moving 101:21 muddled 24:20 multiple 87:1	97:14 N N 3:1 4:1 name 6:10 129:8 130:9 narrow 91:11 natural 98:1 nature 107:3 need 9:6 63:14 64:13 103:21 needed 104:9 needs 63:10 64:2 64:9 85:2 124:10 never 38:2 91:15 92:9 94:3 nevertheless 6:18 New 3:12 node 114:6 115:5 115:7,7 nodes 113:22 114:1,6 115:8 115:12 noise 111:6 normalize 110:16 122:17,20 normalized 109:4 NOTARY 127:22 129:22 note 28:21 noted 126:17 129:16 notes 7:20,22 noticing 128:13 noting 128:13 number 47:11,12 47:16 50:6 55:12,13,14 67:18 numbers 21:22 47:17 50:9 69:19 NW 1:21 3:18 128:3 129:2 130:2	NY 3:12 O oath 9:14,18 object 99:18 100:2,4,9,11,20 101:3,11,18 102:1,1,18 103:6,8,9,20 104:5,7,21,21 104:22 105:5 105:12 106:2 108:19 110:12 111:8,11,22 112:2,6,9,19,20 113:10,13 114:3,5,7,8,10 114:21 115:10 115:11,13,16 115:17,20 116:1,2,3,4,5 116:20,22 117:2,5,7,8,10 117:14,21 118:6,8,10,22 119:2,4,11,17 119:20 120:13 121:9 122:3 123:21 124:17 125:2 Objection 30:16 30:19,20 42:14 51:12 52:12 66:5 82:5 96:15 121:6 objects 101:21 105:1 106:20 107:11,16,16 109:13 111:13 112:15 115:20 118:7 124:6 125:3 obviously 13:7 20:9 34:4 35:4 37:3 44:2 46:16 47:17 48:21 51:2,15 64:14	68:20 70:13 74:6 75:6,11 76:7,8 81:18 87:18,22 91:18 97:13 100:3,22 101:8,20 103:11 105:16 107:8 109:19 110:6 113:9 122:18 occluded 117:22 117:22 118:3 occur 24:14 occurrence 12:19 13:15 16:10 17:11 19:8,10 57:1 occurrences 19:7 47:22 71:14 occurring 22:5 24:13 32:16 40:15 58:10 75:21 occurs 18:22 19:2 offensive 29:14 office 1:1 7:3 128:11,15 official 127:15 Oh 17:3 okay 6:6 7:2,9,14 7:19,22 8:3,6 8:13 9:2,4,11 9:13,22 10:6,9 11:10 13:16 14:13 15:3,15 17:5 20:18 21:5 21:10 22:18 27:17 29:21 32:22 33:16,18 36:21 38:18 39:1 43:2,9 44:8,16,22 46:18 54:16,22 57:7,19 60:3 66:16 67:22 68:8 69:18 72:1	72:8 80:4,19 84:18 85:21 86:10 87:4 94:20 95:12,22 96:4 98:20 99:9 102:16 108:13 111:11 122:7 122:16 124:7 124:16 126:9 once 10:9 open 15:14 24:8 25:5 59:16,16 60:1 63:5 64:11 65:7,9 69:22 71:8 73:11,21 74:19,21 75:1 76:19 81:2,4 84:13,19 85:6,7 85:8,8 88:7,16 88:22 98:10 open-endedly 28:2 opened 98:15 operating 99:16 101:4,8,10,16 103:4 operation 32:2,8 42:22 45:12 46:3 105:21 opine 43:1,5 opinion 76:8,8 opinions 20:14 30:12 33:21 42:17 48:8 74:11 99:10 opponent 39:22 49:22 74:22 75:4 76:11 78:14 79:4,9,13 80:5 81:5 89:14 89:15,16 90:10 90:11 opponent's 39:21 47:4 63:12 64:4 opposing 40:2,4 47:6 48:15 49:1 50:1 65:10
---	--	--	--	---

68:18,19 82:17 option 128:12,12 Oral 2:4 oranges 44:7 organized 27:20 original 27:19 128:13 overlying 106:20 107:10 oversimplifying 103:1 121:8 Owner 1:9 3:15	65:5 75:9 77:4 91:10 95:4 102:20 115:10 particularly 106:12 parties 127:12 pass 23:20 27:14 45:9 46:20 48:12,19 49:10 60:10,14 61:5,8 61:22 62:5,14 62:17 63:1,1 65:18 66:1 67:10 69:3,13 69:14 71:9 72:4 72:20 73:2,4,6 73:13,15,22 74:1 75:9,20,21 77:3,4,6,13 78:19,20,22 79:17 80:6,16 80:20 81:1,8,12 81:16 83:3,4,5 83:6,14,17 84:14,15,19,20 85:3,5,10 117:15 125:10 126:6 passage 57:20 92:20 passed 62:17 63:2,3 69:6,16 70:9 71:11 72:7 72:10,11 73:7,8 73:9,13 80:20 passes 65:22 66:20 68:2,4 69:22 71:7 72:3 73:21 passing 63:6 73:14 75:2,5 76:1,4,10,20 77:14 78:1,10 79:2,3,8 80:1 81:3,14,20,21 83:13,19 110:21 113:3	patent 1:1,3,9,12 3:15 5:6,7,8 22:1 98:8,15 105:18 116:18 119:6,7 120:4 121:4 124:14 124:22 125:1 pauses 8:21 pending 9:9 percent 49:4,5,8 49:8 50:10,11 50:12 51:10,21 51:22 52:1 54:11,13 91:4 91:13 92:7 95:5 95:9 96:6,17 97:6 period 128:14 person 119:19 perspective 115:19 Petitioner 1:6 3:2 Ph.D 1:15 2:4 3:9 4:3 6:1 121:13 127:6 128:1,8 129:8 130:9 physically 7:2 29:22 picture 116:1 118:18 120:9 120:22 124:9 124:11 125:7 pictures 124:12 124:13 piecemeal 44:8 pieces 28:15 pixel 109:7,8 110:19 122:14 122:14,19 pixels 114:9 119:21 122:1 place 22:7 23:7 58:13 59:3 73:16 106:1 127:7 places 90:18 plane 114:16	126:2 play 35:3,12 37:13 44:20 46:14 80:4 playback 33:17 35:7,10 45:14 61:12 63:15 71:3 75:19 77:11 81:11 95:12,16,16 96:9,12,20 playbook 26:11 28:22 29:7,12 played 51:17,20 player 20:2,22 39:17 40:2,4 47:6 48:15 50:1 51:5,6 59:16 65:20,22 66:3 66:21 68:3 70:1 71:8 72:3 73:16 73:22 81:5,5,9 82:15,17,19,21 83:1 84:3,13,14 84:19,19 85:4,6 85:7,8,8 88:2 88:11 89:16 90:11,22 91:1 93:13,15 94:11 player's 51:11 56:2,16 57:9 89:15 94:12 players 22:13 23:13,14 24:6 25:4 37:17 44:11,13 58:17 58:22 59:7,14 59:22 68:19 79:4,5,7,13,15 89:14 94:22,22 playing 66:19 70:12 82:18 83:11 playtime 51:17 please 14:21 33:6 67:5 106:5 109:10 126:8	128:10,12,13 128:14 pleasure 6:14 plenty 10:15 plop 122:13 point 36:10 69:3 89:18 98:2 105:10 pointer 18:20 points 35:15,17 36:3,4,6 37:15 37:18 114:15 pop 19:16 portion 16:22 118:4 portions 115:12 position 22:12 23:13 24:6 25:4 56:2,16 57:9 59:7,14,22 90:2 positioning 62:13 positions 74:16 potential 39:13 111:7 potentially 27:12 53:3 57:11 125:18 practice 25:11 prefer 7:17 14:4 preferred 28:13 28:19 present 28:13,20 102:8 presently 109:6 110:18 press 11:10 pretty 86:21 previous 29:4 54:8 56:18 121:1 previously 43:17 55:5 96:5 prior 48:6 50:13 90:6 124:19 priori 117:10 privilege 6:14 probably 23:18
P				
P 3:1,1 P.C 3:4,10 p.m 126:17 page 4:5 5:3 99:8 113:15 127:4,8 128:13 129:6 130:11 pages 129:12 papers 121:14 paragraph 39:16 40:21 47:2 54:8 54:17 61:3,9 103:14,18 104:13 111:18 111:20 112:12 parameters 32:17 parent 115:6 parked 118:1,17 part 12:8 20:15 33:9 43:7 52:2 55:6 61:10,12 94:5 101:13 110:9 partial 116:14 117:21 118:3 particular 20:5 22:4 26:13 32:6 32:16 43:14 45:19 46:4 48:15 50:17 54:7 56:5,7 58:9 61:21 62:5				

26:2 36:8,9 80:8 86:4,6 89:6,12 problem 10:12 62:4 117:19 121:8 Procedure 2:7 128:14 Professional 2:8 profile 21:14,16 21:19 26:8,14 28:15,22 29:7 29:11,12,14,15 31:6 32:6,10 38:10 44:17 45:21 46:1 52:2 55:8 58:7 90:21 91:3 profiles 21:20 program 12:17 13:6,13 16:7,8 31:13 32:7,15 34:12 37:2 41:15 45:20 46:3 programmed 29:20 programming 29:19 programs 16:5 proper 104:11,12 properly 106:2 113:5 proposed 26:3 provide 18:11 28:5 44:13,15 44:19 78:16 provided 19:12 provides 20:21 44:9 46:22 78:9 107:22 PUBLIC 127:22 published 121:14 pump 27:14 32:19 58:10 85:19 86:7 87:5 87:8,14,19 88:1	88:7,11,13,15 88:16,19,20,21 89:17 90:16,17 90:19 91:5,11 91:13,15,18 92:5,7,9,21 93:1,10,10 94:2 94:3,8,18,21 95:4,8 96:2,6 96:17 97:6,8,12 97:17,18 pumped 90:12 pumpFake 27:11 purchased 128:11 purpose 31:19 120:14 pursuant 2:6 pushed 28:1 put 9:22 65:3 96:5 Q quarter 23:21 quarterback 22:14,19 23:18 27:13 60:1 question 8:13,17 8:20 9:9,10 12:7 15:17 24:21 27:19 30:17 33:6 36:20 39:3 42:16 56:10,12 57:7 62:3 63:22 66:11,13 82:12 91:22 92:11 questions 6:13 8:11 15:12 20:8 30:10 86:20 126:5,16 128:14 129:15 129:17 quite 6:16 26:2 R R 3:1 6:1	Randi 1:19 2:7 127:21 random 38:6 randomly 39:6 39:11 40:11 47:10,15 50:6 54:4 range 47:7 reach 35:20 36:16 37:21 46:13 109:8 react 20:1,4,4 read 62:18 65:15 76:15,21 77:2 92:20 95:21 96:3 99:14 104:14 109:15 111:16 112:5 112:11 114:2 129:11 reading 39:16 ready 128:10 real 36:1 106:21 107:11 real-time 108:17 108:19 110:7 110:12 real-world 106:18 107:2 107:16 108:6 reality 106:14,16 106:22 107:4 107:14 108:2,5 really 29:21 reason 6:19 reasonably 65:14 rebound 65:17 66:3,20 67:1,9 68:1,17,21 69:1 69:22 70:18,20 70:22 71:7 72:2 73:4,21 rebounds 72:9,10 72:11 recall 61:15 received 72:19 104:2	receiver 59:16 60:2 receivers 44:21 receives 73:21 receiving 63:5 64:11 65:7,8,9 66:3 73:12 74:19,20 75:1 76:1,5,19 77:15 78:1,11 79:2,10 79:11,14 80:1 81:2,4,14,21,22 83:19 recess 60:6 98:3 126:14 recognition 111:22 112:7 121:11 record 10:15 15:20 17:2,10 31:17 32:20 56:22 63:5 70:6 70:17 71:2 72:6 73:11 75:12 76:14,17 88:18 89:1 94:17 126:8 record's 64:1 recorded 38:4 55:12,13,14 62:16 70:2,7,15 71:9,14,15,16 71:17,20 72:5 72:12,13,21 74:1,2,4,8,15 82:20 83:1,2,9 87:11,13 94:15 95:10 129:15 129:18 recording 13:7 17:12 69:12 73:14 80:21 81:4,7 88:1,19 93:4,11 94:10 records 11:22 12:9 13:3,8 15:22 16:12	31:14 62:21 65:7 73:5 74:19 75:1,8,14,15 77:3 80:18,19 81:2 87:19,20 90:12 92:20 93:5 red 122:19 reference 18:22 19:3,17 20:6,10 26:19 30:11,13 33:19 74:9 referenced 20:22 128:10 referencing 20:16 31:5 33:22 34:2,7 referring 17:1,3 109:19 refers 28:10 100:12 108:4 refill 9:7 reflected 42:11 regions 115:13 Registered 2:8 relate 104:19 related 21:20 80:13 81:18 82:3 relates 104:3,15 relation 75:5,9 94:11 relatively 65:11 release 88:7,22 88:22 89:6 90:8 relevant 70:12 REMOTE 1:14 remotely 8:3 remove 84:12 render 71:5 repeat 33:6 repetitive 24:22 Reported 1:18 reporter 2:8 49:6 63:9 127:21 representation 100:10,12,15
---	---	---	---	--

112:2,9 114:3,7 114:21 115:17 115:18,20 116:3,6 117:1,3 117:6 118:6,8 119:1,6,7,12,20 120:1 representations 99:19 100:2,4 100:20 101:3 101:12,18 102:1,2,18 103:6,9,9,12,21 104:5,7,22 105:2,6,13 106:2 113:13 114:11 117:7 118:10 125:2 represented 114:9 117:1,3 representing 38:7 requires 9:18 99:14 rescale 123:6,7 respective 47:7 respond 37:5 39:10,15 40:5 48:5 49:13 52:5 responding 50:22 responds 16:13 39:11 response 12:1,9 13:4,9 15:22 17:11,13 19:10 27:8 33:2,12 34:5 38:6,8 39:7,11 40:12 40:13,15 41:6 48:18 52:9 54:4 57:1 84:9 responses 19:7 27:6,15 47:7 restroom 9:7 resulting 109:6 110:19 Rethink 106:10	retrieve 31:6 40:18 41:18 56:6 retrieved 42:4 66:2 68:1,16 69:1 retrieves 32:5,9 42:7 43:12 45:20 65:17 66:19 67:1,4,9 69:22 71:7 72:2 review 128:11 RGB 119:21 121:21 123:19 Richardson 3:4 3:10 right 9:16,19 10:14 11:16,20 12:4,10,21 13:1 13:4,9 14:8 16:1,16,21 19:13 22:22 24:9,10,11,16 24:18 25:6,22 27:12 29:5,6,6 32:19 33:14 34:12 35:15 37:2,16,17 38:16 40:6,8,19 41:16,19,22 42:4,8,13 43:18 43:22 44:10,11 44:13 47:9 48:2 48:4,18,20 49:8 49:17,19,20 50:12,19,20 51:11,18,19,22 53:14 54:9,14 55:6,13 56:3,17 57:10 58:2,5,10 58:22 59:17 60:15,16 61:19 63:13 64:5,19 68:15 69:5 70:14 71:10,16 72:5,14,21 74:2 74:16 75:10,17	76:20 77:1,5 79:6,16,20 82:18,19,20,21 84:18 87:5,6,11 87:14,17 88:4 89:2,3,7,18 90:6,21 91:2 92:20 93:1 94:4 94:7,8,14,15 96:17 100:20 101:1,9,21 102:8 104:14 105:17 106:14 107:17 109:14 111:14,16 112:15 117:2 119:11 122:20 123:1,12 124:8 124:22 right-hand 51:6 rights 71:18 ring 7:17 road 19:16 robot 107:21 117:14 118:17 123:9 124:5,9 125:6 Robotics 106:10 roll 120:19 room 6:22 root 114:6 115:5 115:7 rotate 50:18 rotated 125:19 126:1 rotation 123:5 125:22 rotations 125:20 roughly 17:8 RPR 1:19 127:21 rules 2:7 6:17 128:14 run 109:4 110:15 122:10 running 20:2,22 22:15,20 23:22 27:8 39:17,21	40:3 47:5 48:1 48:22 49:21,22 51:5,6 68:15 69:2 71:12,12 73:16 77:8 81:10 82:15 84:3 88:2 90:22 91:1 93:15 S S 3:1 6:1 Saber 1:15 2:4 4:3 6:6 98:7,14 127:6 128:1,8 129:8 130:9 salute 36:9 saying 19:6 67:3 83:9 91:17 92:13 111:3 says 18:4 19:19 22:1,9 23:1 26:21 27:11 28:6,22 29:7 31:4 32:2,13 35:1,2,6,11 37:11 39:4 40:11,21,22 41:20 42:1 43:12 45:1,6 46:6,11 47:3 48:14 54:11,22 56:5 58:3,8 59:1 65:5 74:17 77:12 78:10,21 79:22 80:16 83:18 87:6,8,19 92:21 95:13 103:15,18 104:15 108:16 109:3 110:3 122:4 scale 111:10 113:10 122:6,7 122:22 123:4,5 123:9 125:18 125:22 scales 113:11,12	125:17 scenario 85:9 scene 119:16 125:8 Scope 30:16,19 score 46:16 109:7 110:19 111:1 113:8 123:21 125:12 Scores 111:4 seal 127:15 search 46:4 second 25:20 38:7 45:19,21 45:22 61:11 see 10:12 13:20 14:17,19 20:1 21:7,12,15 23:1 23:5 26:5,8 27:1,11 28:9,11 28:14,17 29:1,5 29:7,13 31:4,12 31:21 32:1,3,12 35:1,2,11 36:10 37:11 38:10 39:3,4,20 40:10 40:21,22 41:2 44:22 45:10,12 45:16 46:6,9,11 46:21 47:3,19 48:14 50:7 54:1 54:3 56:5,19 58:3,8 59:1,5 60:1 61:3,14 62:12 65:5,8 73:2 74:17 76:5 77:16 78:13,15 78:21 79:4,22 80:16 85:6 87:18 88:20 95:20 98:7 99:5 99:13,20 100:2 103:15 108:21 109:3 110:3,4 112:3,13 113:4 113:18,19,21 114:9,12,22
---	--	---	--	---

115:2 117:15 118:2 119:10 120:7,20 121:15 122:1 124:1 seeing 84:1,7 93:18 seen 10:16 50:20 sees 52:6,8 65:20 97:16 117:14 117:14 121:22 121:22 segment 116:2 select 47:10,16 50:6 selected 41:1 128:12 send 79:12 83:15 85:10 88:12 sense 18:20 27:15 29:17 32:9 52:2 79:19 90:4 91:16 92:10 93:17 110:22 115:9 123:16 123:17 sensor 110:8 sensory 112:13 sent 7:17 sentence 32:12 37:9 38:1 109:3 separate 8:8 set 55:7 61:9 102:4,9 103:8 106:7 111:4 118:16 127:7 127:14 sets 99:16 100:19 101:4,7,9,11,15 101:20,22 102:7,18 103:3 103:4,10,20 104:6,7 105:7 105:13 106:1 shape 121:15 122:8 123:22 shapes 124:19	shearing 126:1 sheet 128:13 129:16 130:6 shoot 89:12 90:3 95:18 96:12,21 96:22 shooter 65:18 shot 60:10,14 61:5,8,22 62:6 62:21 68:6 69:9 69:15 73:2,3,5 73:15 75:9,20 75:21 77:6 80:17,18,19 81:1,8,12 83:3 83:15,17 90:3 show 14:16 23:11 90:15 95:4 showed 91:9 shown 21:14 26:15 29:11,12 29:13 31:9,10 35:7 117:4,4 shows 119:16 shut 10:18 side 29:5 36:8 39:14 sideline 20:3 21:1 39:18,22 40:1,3 47:5 48:1 49:21 50:1,4 51:5,7 68:16 69:2,16 71:13 73:17 77:8 81:10 82:16 84:3 88:3 93:15 sidelines 48:22 sign 128:11,11 signature 128:10 128:13 129:6 129:19 130:22 signed 128:13 significantly 121:8 signing 128:12 similar 52:10 68:8,12,14 69:1	69:11,13 73:18 86:21 similarity 108:18 110:11 114:16 Similarly 47:15 simple 124:4 simplifying 102:22 simplistic 84:11 88:17 93:22 97:12,15 simply 103:22 simulate 44:4 simulated 35:13 35:14,15 36:13 37:14 38:8 39:21 42:2 44:10 45:2,5,7 45:8 46:11,19 47:4 48:13 49:11,15,22 55:1,16,20 95:19 97:1 simulation 11:15 11:20 32:9 33:4 33:14,17 34:10 35:7,9 36:22 37:7 38:15,20 39:4 40:7 44:5 44:9,15 45:14 54:3 71:19 77:10 83:12 simulator 12:16 13:10 16:4 17:9 31:10,13 32:5 32:13,15,20 35:18 36:14 37:16,18 38:5 39:6 40:10,11 45:20 46:2,15 47:10,15 48:5 50:6,21 51:15 54:3 56:20,21 62:21 65:6 71:4 73:5,11 74:18 75:22 77:12 78:22 80:18	81:2,13 85:1 95:17 96:2,12 96:20 simulators 39:10 Sincerely 128:18 sir 6:15,20 8:6 9:2,20 12:7 15:11 16:20 17:20 30:17 34:2 36:19 37:6 41:13 42:21 44:7 54:18 57:22 61:1 82:10 85:16 97:20 98:9,12 98:16,19 100:1 106:3,6,8 107:17 108:12 109:9 111:17 111:19 113:17 120:12,16 sitting 120:9 125:6 situation 20:5 22:5,8,10 23:1 23:2,5,10,14,15 29:14,15 32:16 33:2 35:19,22 36:15 37:4,12 37:16,19 38:3,5 38:11 39:7,12 39:13 40:5,12 40:16 41:5 42:12 46:14 47:20 48:4 49:13 54:4,13 58:1,11,14 59:2 59:4,6,10,18 81:12 90:13 91:5 96:22 104:4,16 situations 25:17 33:11 40:14 46:5 58:1 97:15 104:1,18 slim 36:8 slow 33:7	slower 66:12 smaller 123:13 Smith 3:17 128:2 somebody 24:7 somebody's 24:7 sorry 12:13 24:20,22 33:7 67:5,7 80:11 96:1 109:9 sorts 120:11 sound 8:11 sounds 86:7 spatial 100:8,10 100:14 speak 98:13 speaking 11:17 11:18 33:8,15 57:11 61:20 64:20 65:11 106:15,19 107:10 speaks 53:12 spec 76:16 specific 20:17 33:22 34:6 38:22 42:18 48:10 52:19 53:1,17 60:8 62:19 63:16 72:15,17 73:1 73:19 74:12,14 80:9 91:22 107:8,18 specifically 13:8 43:5,8 51:14 66:9 77:20 80:8 81:17 83:18 sphere 124:6,12 125:5,6,16 spin 47:17,18 48:17 49:4,7,8 50:11,13 51:18 51:19 54:9,9 55:12,13 71:17 71:17 82:18 spun 48:2 50:18 50:19 51:22
--	--	--	--	---

52:1 54:13,14 55:11 69:5,8 70:8,13,14 82:19,20,21,22 88:4,4 91:2,2 Square 3:11 standard 110:17 113:5 standing 119:19 stands 30:17 start 8:18,20 103:17 starting 17:18 21:8 26:6 34:15 35:6 37:10 41:9 41:12 45:11 47:1 54:18 57:19 80:16 85:20 95:13 98:21 121:12 starts 45:14 60:11 109:22 state 108:1 stated 30:4 states 1:1 13:10 17:9 25:8 28:18 56:9 59:9 72:22 100:21 statistical 39:8 54:5,10 55:19 90:21 91:19 93:12 95:11 statistics 89:12 step 27:17 53:11 66:13,13 stop 10:13 storage 20:20 28:6 store 17:13 57:2 stored 28:3 30:2 38:1,4 39:9 40:22 43:20 54:6 61:18 62:2 62:9 66:2,4,18 92:17 104:6 105:9 109:5,14 110:17 111:14	117:10,12 stores 16:15,20 19:10 64:17,18 64:21 65:4 87:16 straight 76:16 strategist 62:20 strategy 62:11 81:19 stream 104:4,5 105:5,6 Street 1:21 3:5 3:18 128:3 129:2 130:2 structure 16:18 21:14 26:1,3,4 26:14 28:7,12 28:18,21 29:18 31:22 44:2 91:9 115:9 structured 30:1 115:2 structures 17:6 25:13 28:4,10 44:18 stuff 87:3 121:15 sub 21:20 114:6 115:8 Suite 1:21 3:5 129:2 130:2 summary 17:6 sure 12:6 13:19 25:16 37:6,7 54:2 62:4 67:12 91:17 92:12,13 102:11 surrounding 22:6 23:2,5,7 24:11 58:11,16 59:2,4,19 72:20 sworn 6:2 127:10 system 25:10 32:22 33:10 34:10 37:1 44:3 44:10 45:4 49:3 64:2 91:8 94:15 116:21 118:5	120:8,13,14 Systems 105:18 T table 26:22 tackle 22:16,20 24:1 take 9:6,11 22:7 23:6 27:17 38:11 44:8 49:14 53:11 58:12 59:3 60:4 60:12 85:11,19 97:21 98:2 120:18 122:4,9 125:9 126:7 taken 2:6 60:6 69:8 72:9 98:3 126:14 127:6 takes 33:13 46:16 118:14,18 120:8 124:9 125:7 talk 8:16 11:14 25:9 33:16 60:18 99:3 talked 24:18 43:17 68:9 93:13 talking 15:5 21:12,13 31:14 34:8 45:11,12 45:14 53:7,16 53:19 54:8 58:4 60:15,16 61:4,7 63:15,18 86:22 89:21 108:14 109:16,22 112:12 121:20 122:8 talks 21:7 60:17 61:10,12 team 63:11,12 64:3,4 68:19 technical 8:5 13:18 technique 110:17	113:6 techniques 108:3 technology 25:15 tell 6:19 9:18 62:1,6 65:13 66:17 86:2,13 120:3 template 108:17 109:5,14 110:9 110:18,21 111:14 113:2,4 113:6 117:9,18 122:5,7,9 123:7 123:8,19 125:9 templates 110:10 temporal 100:7,9 100:11,12,17 100:18 101:19 103:7,19 104:9 temporally 99:3 99:4,5,17 100:5 100:6 101:17 102:19 103:5 term 86:8 99:2 terminologies 66:10 terminology 57:18 terms 57:13 terrific 10:2 Tesla 1:5 6:11 11:7 128:6 129:7 130:8 testified 6:2 testing 85:17 text 7:6 114:2 Thank 9:3 63:17 thereof 127:13 thing 47:9 70:17 110:10 125:15 things 26:9 43:6 51:16 56:2,16 57:9 58:7,21 72:13,16 75:8 75:13,15,16 87:11,13 90:18 102:20 105:10	113:5 116:19 119:17 120:11 think 13:17,22 17:7 25:15 27:22 30:6 36:19 39:17,18 44:6 46:22 53:17 60:14 65:13 76:14 82:6 86:4,11,12 86:14 89:21 93:18,22 102:22 103:14 109:16 120:4 120:17 122:5 123:21 thinking 33:8 third 12:15 25:21 46:13 Thomas 5:6 11:4 11:7,14,14 12:3 12:14,22 13:2 14:11 15:14,21 16:18,19,20,22 17:5,7,9,22 20:9,12,20,21 21:4,6,12,15 22:17 24:3 25:1 25:7,11 26:1,5 26:6,14 28:5,6 28:18 29:22 30:4,6,18,22 31:2,2,17,21 32:22 33:10 34:2,3,8,11 36:22 37:7 38:14,20 39:2 40:7 41:10,11 41:14,22 42:22 43:9 44:3,9 46:22 53:2,7,7 53:12 54:1,15 54:17,22 55:7 55:18 56:9,13 56:19,21 57:14 58:14,21 60:9 60:17 77:21
--	--	--	--	--

78:5,6,8,9,18 102:13 103:18 103:21,22 Thomas' 17:3 25:9 28:3 thought 89:18 thousand 120:20 three 7:17 15:13 36:4,6 51:2 55:10 70:15,19 three-point 65:19 65:21 66:21 67:11 68:3,6 69:14 70:1,10 72:4,11 73:6,22 83:5 threshold 111:4 111:5 throw 45:9 46:20 48:19 throwing 22:14 22:19 23:18 24:4 25:2 48:12 49:10 thrown 23:21 27:14 throws 27:13 till 122:15 time 10:13,15 11:13 15:6 21:17 22:11,21 23:11,12 24:5 25:3 35:3,12 36:11 37:12 46:15 49:4 50:10,11,12 51:10,21 53:11 54:14 58:16 59:6,21 67:16 82:20 84:1,7 91:4,13 92:8 95:5,9 96:6 97:6,21 100:13 101:9,21 102:2 102:8,21 103:10 104:2 104:12,22	126:17 127:7 128:14 timed 100:5 times 3:11 48:2,2 48:3 49:4 50:15 50:17,19,19 51:19 54:9,9,10 54:12 55:11 69:14,15,17 70:8,10,14,14 70:15 71:1,1 72:10 82:19,22 83:2,5,6,7 94:19 tires 114:6 title 105:17 127:8 today 6:13,20 7:5 8:4,16 9:14,19 61:16 top 113:7,21 115:5,7 toss 60:2 90:8 touchdown 35:21 36:17 track 15:20 25:22 tracking 121:12 TRADEMARK 1:1 trained 41:4 trainer 108:2 training 107:21 transcript 2:3 24:15 127:4 128:10,11 129:12 transcription 127:5 129:15 129:17 translation 123:4 125:21 tree 117:17 trees 119:19 120:10 TRIAL 1:3 tries 111:9 trigger 20:19	triplets 44:21 true 127:5 129:14,16 truth 6:19 9:19 try 8:19 35:20 36:16 37:21 82:12 88:11 91:21 117:17 117:18 125:19 trying 10:18 20:10 68:20 90:14 95:2 107:12 110:2 113:4 114:13 115:16 116:2,9 124:17 turn 8:9 57:19 60:12 106:4 108:9 111:17 turning 31:1 two 20:3 22:11 35:4,12 36:5,11 37:13,14 50:3 51:7 59:10 73:17 75:16 105:10 107:13 two-dimensional 94:7 TX 3:6 type 47:9 62:22 73:6 80:19,19 91:6 92:16 110:9 114:16 typically 9:4 107:21 typo 22:2 109:8	66:6,11 67:12 76:22 84:16 85:1 89:21 91:22 92:11,12 99:22 102:10 109:1 understanding 20:11,12 38:14 38:19 87:2 107:5 understood 65:14 94:15 unguarded 65:21 66:4,21 67:11 68:3 72:3 UNITED 1:1 upload 7:13 12:2 12:4 13:17,21 14:10,11,14,15 14:21 use 7:18 25:14 26:10 45:21 53:2,18 54:14 54:16 71:4 84:11 86:15 102:11,16 116:12 118:12 124:3 user 13:5 17:10 17:12,14 19:9 21:14,15,19 26:8,14 28:15 31:6 32:6,7 33:1,11 35:13 35:14,15,19 36:13,15 37:14 37:20 38:2,7,7 38:10 44:17 45:18,19,22 46:12 48:2 55:8 56:22 57:2 58:7 61:17 62:1,8,12 65:17,20,22 66:19,19 67:1,3 67:5,8,10,14,16 67:19 68:2,22 69:21 71:6,8,11	71:13,16 72:2 73:20 87:14,19 87:21,22 88:6,7 88:15,16,19 89:4 90:1,5,10 90:16,18,18 91:11,18 92:3,3 92:4,5,21 93:5 93:7 95:4,19 96:6,13 97:1 104:1 user's 12:17 13:11 16:4,6 31:15,15,17 32:14,20 45:21 48:6 63:11 64:3 87:21 89:22 90:9 93:5,8 users 16:13 71:21 uses 16:20 33:3 33:13 58:14,14 107:15 usually 100:12 utilizes 17:5
V				
v 1:7 128:6 129:7 130:8 vague 92:1 value 38:1 41:1 42:3 49:16 50:8 50:22 55:1,17 values 39:8 47:8 54:6 119:22 123:20 variables 26:12 84:12 variation 113:10 variations 111:10 various 113:12 versa 18:15 versed 25:16 66:8 68:13 70:20,20 version 117:9 versus 94:8 123:15				

vice 18:15	wide 24:7 25:5	years 34:22	113:13,14	202)-232-0646
victory 36:9	witness 4:3 14:4	121:11,17	116:6,18,22	128:15
video 100:13,14	14:15,19 15:4	York 3:12	117:6 118:7,9	202)232-0646
virtual 64:14	15:13 30:21	Z	119:6,7 120:1,4	130:4
75:6 79:6 94:13	42:15 49:7	Z 115:17	121:4 124:14	2024 2:9 127:16
94:14	51:13 52:13	zone 35:20 36:16	124:22 125:1	128:7,20 129:9
visibility 18:14	66:6 82:6 96:16	37:21	126:4	130:10
W	97:21 121:7	Zoom 2:9	14 2:9 27:11	20th 3:11 127:15
waive 128:12	126:6 127:9,14	0	128:7 129:9	21 57:20
want 10:13 13:19	128:11 129:8	1	130:10	23 45:11
18:21 19:2	129:19 130:9	1 31:11,12 100:22	15 60:4 92:3 94:1	232-0646 1:22
25:10 41:7	word 58:15	107:20 127:4	95:5,10 96:7,13	129:4
44:19,20 52:14	102:11,19	1:20 126:13,17	97:3,16	28 39:2 40:10
52:15 53:1,16	119:7	10 5:5,6,7 47:16	16 22:3 58:8	68:11
54:2,19 57:16	wording 53:2,3,6	47:18 69:14	113:16 115:1	29 17:19
60:8,9,12 65:3	54:15,17	70:10 123:10	117:2,4,5	3
65:13 66:17	102:15	123:14	119:11	3 28:8
82:10 86:2 99:3	words 52:21	10-minute	17 109:22	30 35:6 45:13
120:3 126:10	56:13 65:3	126:11	1717 3:5	48:2 49:5,8
wants 79:12 85:5	102:3 109:12	100 47:11,13,22	173 98:18,20	50:11,17 51:19
Washington 1:21	work 11:11 25:11	50:7,15 51:10	1730 1:21 129:2	51:22 54:9,13
3:19 128:4	120:17 121:13	69:15,16,17	130:2	55:13 56:21
129:3 130:3	worked 121:9,17	71:14 72:9,10	18 108:9,11	70:8,14 71:17
wasn't 66:14	working 10:10	95:5,9 96:6,17	19 23:4 26:7	82:22 83:6 91:2
wasting 11:13	11:11	97:6	47:21 57:20	92:6 93:9
way 7:4 12:15	worth 36:4	1001 5:8 98:4,7	1999 3:18 128:3	33 17:8 27:11
38:19 49:5	written 128:22	98:15	2	34 17:19 40:21
50:12 69:20	wrong 25:14	10036 3:12	2 17:8,18 41:9,12	35 41:9,12 47:1,2
120:17 122:15	X	1005 5:6 10:20	43:10 45:1	54:18
we'll 9:8 10:12	X 4:1 94:19	11:7	49:15 54:17	36 39:20
15:4 67:20	115:17	1006 5:7 10:22	56:21 107:22	37 99:8
89:19 120:7	Y	11:8 106:4	20 23:4 46:12	38 43:10 45:1
we're 8:3,15	Y 115:17	11 95:14	48:2 49:8 50:12	39 45:1 49:15
13:22 30:9 34:8	yard 46:12 80:5	11,238,344 1:12	50:19 51:19	3A 31:1,9
52:16 53:7 54:7	yeah 10:14,17	120 31:10,13,14	52:1 54:9,11	3B 31:1 35:8
60:15,16 63:18	12:13 14:9,17	32:5,13 35:18	55:11,12 57:20	4
86:17 89:21	15:1,7 30:7	39:6 77:12	70:13 71:17	4 21:3,6,8,13,15
93:18	33:7 39:19 41:3	125 127:5	82:19 83:5 91:2	21:16 30:22
we've 10:14 60:3	49:12 53:6,15	127 111:18,19	93:9 105:1	31:20 32:2
97:22 112:12	59:1,18,22 61:2	13 21:8 26:6,17	109:22 113:15	57:19 58:4,6
weighted 39:8	63:14 67:7 72:6	99:3	123:11,12	109:17
54:5	85:17 88:18	130 31:13	20006 3:19 128:4	40 49:15 69:17
went 69:15	89:8 90:5,14,20	134 5:8 57:15	20036 1:21 129:3	44 68:11
WHEREOF	93:14 94:6 95:2	98:8,14 100:3,3	130:3	45 46:7
127:14	118:13 124:2	105:16 106:7	2007 5:5 10:3,8	5
white 112:22			202 1:22 129:4	

5 30:22 34:15	7			
35:2 37:10	7 3:11 28:9,17,21			
45:10 109:17	29:11,13 60:11			
109:18,19,20	61:1 73:1 98:17			
110:1,2,4,8	98:19,20 99:2			
123:15	103:15 104:3			
50 34:15 35:2	104:15,18			
48:3 49:3,4	75201 3:6			
50:10,19 51:21	8			
54:10 55:14	8 85:20,21 86:17			
69:15 70:14	86:17,19,19			
71:15,16 72:10	87:6 95:13			
72:10 83:2,7	98:21			
89:5 90:7 91:2	8-minute 126:13			
91:4,13 92:7,8	812 1:21 129:2			
93:9 94:2 98:1	130:2			
108:10,13	852 114:1			
500 28:22 29:4,8	853 114:1,2			
110:8	855 73:2			
5000 3:5	89 103:14 104:14			
506 110:9	9			
508 108:15,16	9:58 1:16 2:10			
109:16 110:4	98 5:8			
51 47:13				
53 47:12				
54 37:11 108:10				
108:13				
55 60:11,22 61:1				
61:4 80:16				
550 31:5,6				
57 74:18 76:16				
59 75:19				
6				
6 4:7 28:9,11				
29:5,6,12 39:2				
40:10 47:1 54:1				
68:11				
6-2 59:11,12				
60 32:3				
600 95:17				
62 32:13 77:12				
63 26:18				
64 61:4				
650 21:14				
655 22:1 58:2				
685 22:1 58:9				

1

CERTIFICATE

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

I, the undersigned authority, hereby
certify that the foregoing transcript, page 1
through 125 is a true and correct transcription
of the deposition of Eli Saber, Ph.D., taken
before me at the time and place set forth on
the title page hereof.

I further certify that said witness
was duly sworn by me according to law.

I further certify that I am not of
counsel to any of the parties to said cause or
otherwise interested in the event thereof.

IN WITNESS WHEREOF I hereunto set my
hand and affix official seal this 20th day of
June, 2024.



RANDI GARCIA, COURT REPORTER, RPR

NOTARY PUBLIC