

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 NINTENDO CO., LTD., and
6 NINTENDO OF AMERICA INC.,
7 Petitioners,
8 V.

9 AMERICAN GNC CORPORATION,
10 Patent Owner.

11
12 IPR2024-0067

13 (Patent 6,508,122 B1)

14 IPR2024-00668

15 (Patent 6,671,648 B2)

16
17 REMOTE DEPOSITION OF

18 DR. LAWRENCE LARSON

19 FRIDAY, MARCH 28, 2025

20 5:58 A.M.

21
22
23
24 STENOGRAPHIC REPORTER: CHRISTA YAN, CSR NO. 14316, RPR

1 REMOTE APPEARANCES:

2 FOR PETITIONER:

3 COOLEY LLP

4 BY: PATRICK W. LAUPPE, ESQ.

5 3175 Hanover St.

6 Palo Alto, CA 94304-1130

7 (650) 843-5000

8
9 FOR PATENT OWNER:

10 BUNSOW DE MORY LLP

11 BY: COREY A. JOHANNINGMEIER, ESQ.

12 701 El Camino Real

13 Redwood City, California 94063

14 (650) 351-7248

15
16 ALSO PRESENT:

17 MILES TAG, The Technician

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INDEX OF EXAMINATIONS

	PAGE
MR. LAUPPY	6
Witness's Changes or Corrections	47
Reporter's Certificate	49

1	E X H I B I T S		
2	EXHIBIT	FOR IDENTIFICATION	PAGE
3	Exhibit 2019 -	Declaration of Lawrence Larson	8
4	Exhibit 1040 -	International Application	31
5	Exhibit 1041 -	Design of Integrated MEMS	32
6	Exhibit 1042 -	Patent No. 6,250,156	33
7	Exhibit 1043 -	MEMS Inertial Rule	34
8	Exhibit 1044 -	Future Prospects for Analog	40
9		Signal Processing, Tutorial	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

1 BE IT REMEMBERED that on FRIDAY, the 28TH DAY OF
2 MARCH, 2025, at the hour of 5:58 A.M., Pacific Standard
3 Time, of said day, before me remotely, CHRISTA YAN, a
4 Certified Shorthand Reporter, State of California,
5 remotely appeared DR. LAWRENCE LARSON, who was examined as
6 a witness in said cause; that said transcript format was
7 prepared in accordance with California Code of Regulations
8 Section 2473.

9 --oOo--

10 THE TECHNICIAN: Thank you to everyone for attending
11 this proceeding remotely, which we anticipate will run
12 smoothly. Please remember to do your best not to talk
13 over one another. Please be aware that we are recording
14 this proceeding for backup purposes. Any off-the-record
15 discussions should be had away from the computer.

16 Please remember to mute your microphones for
17 those conversations. Please have your video enabled to
18 help the reporter identify who is speaking. If you're
19 unable to connect with video and are connecting via phone,
20 please identify yourself each time before speaking.

21 We will provide a complimentary, unedited
22 recording of this deposition with the purchase of a
23 transcript. I apologize in advance for any
24 technical-related interruptions. Thank you.

25 THE STENOGRAPHIC REPORTER: Would anyone like to

1 identify themselves since we don't have a videographer
2 today before we go on the record?

3 MR. JOHANNINGMEIER: Sure. This is Corey
4 Johanningmeier of Bunsow De Mory for American GNC and the
5 witness.

6 THE WITNESS: And I'm Lawrence Larson.

7 DR. LAWRENCE LARSON,
8 the Witness, called on behalf of the Petitioner, being
9 duly sworn to state the truth, the whole truth, and
10 nothing but the truth, testified on oath as follows:

11 EXAMINATION

12 BY MR. LAUPPE:

13 Q Good morning, Dr. Larson.

14 A Good morning.

15 Q Have you been deposed before?

16 A I have, yes.

17 Q How many times have you been deposed?

18 A I would say roughly six to eight.

19 Q And have you been an expert in an IPR proceeding
20 before?

21 A Yes, I have.

22 Q How many times?

23 A Two or three, maybe even four.

24 Q When was the last IPR proceeding you were an
25 expert for?

1 A Oh, well, I'm sorry I can't remember the exact
2 date. I was -- it was within the last six months. I
3 can't be more precise than that, I'm sorry, without
4 reexamining my records.

5 Q And for what entity were you an expert in that
6 IPR proceeding?

7 A Well, I've been involved with some -- there's a
8 company called ParkerVision that has some patents, and I
9 was involved in an IPR involving ParkerVision patents.

10 Q How did you prepare for today's deposition?

11 A Well, I re-reviewed my declaration and the
12 various exhibits that I cited in that declaration. That's
13 pretty much it.

14 Q Did you meet with anybody in preparation for
15 today's deposition?

16 A Well, I met with Mr. Johanningmeier, who's right
17 here with me. And we met to prepare for this deposition.

18 Q How long did you meet with Mr. Johanningmeier?

19 A Maybe about six hours yesterday.

20 Q Did you review any documents in your meeting with
21 Mr. Johanningmeier?

22 A Well, we -- you know, as I said, in preparation
23 for this testimony today, I reviewed my declaration and
24 all the various exhibits. So we went over those documents
25 yesterday together.

1 Q When were you first engaged by AGNC?

2 A Oh, gosh. Once again, I can't give you an exact
3 date without reviewing my records. But it was... you
4 know, about a year ago. Roughly a year ago I would say.

5 Q And I'd like to introduce an exhibit. This is
6 Exhibit 2019, which is your declaration in this
7 proceeding. So I'm going to put that in the chat.

8 (Whereupon Deposition Exhibit 2019
9 was marked for identification.)

10 THE WITNESS: And I'll have a paper copy here that
11 I'll probably be referring to if we talk about it.

12 BY MR. LAUPPE:

13 Q And that paper copy doesn't have any notes,
14 correct?

15 A Yeah, I believe not. Yeah, let me just check. I
16 believe it's a clean copy.

17 No, it's completely clean. There are no
18 markings.

19 Q And so I've introduced Exhibit 2019 in the chat,
20 but obviously, you can also review your paper copy.

21 A Yes.

22 Q Did you draft Exhibit 2019?

23 A Yes. I worked with Mr. Johanningmeier here to
24 draft this. And, you know, we went kind of back and forth
25 with various versions over a period of a few weeks.

1 Q And do you understand that you're here to testify
2 as to two IPR proceedings?

3 A Yes, I do understand that. Yes.

4 Q And these are the proceedings you're here to
5 testify about, are those numbered at the top right-hand
6 corner of the first page of your declaration; is that
7 correct?

8 A Yes. Those are labeled 667 and 00668.

9 Q And so if I refer to IPR 2024-00667 as the '667
10 IPR, will you understand that?

11 A I believe so, yes. And I would just like to
12 confirm that the '667 IPR corresponds to the '122 patent
13 and the '668 corresponds to the '648. I hope that's
14 correct.

15 Q And so if I refer to the '122 patent as you just
16 did, you'd understand I'm referring to U.S. Patent Number
17 6,508,122?

18 A Yes, I would. And I have a paper copy of that
19 here as well.

20 Q And if I refer to the '648 patent as I think you
21 just did, you understand I'm referring to U.S. Patent
22 Number 6,671,648?

23 A Yes, I understand that.

24 Q And then just for the record, if I refer to the
25 '668 IPR, you understand I'm referring to IPR 2024-00668?

1 A Yes, I do understand that. Right.

2 Q Great.

3 And generally, if I refer to the present
4 proceedings, will you understand I'm referring to the '667
5 IPR and the '668 IPR today?

6 A Yes, I understand that. Thank you.

7 Q Okay. And so how many hours have you worked on
8 the present proceedings to date?

9 A Yeah, once again without detailed records, I
10 can't give you a precise number. I would say 40 to
11 60 hours in total from the beginning.

12 Q And what is your hourly rate?

13 A \$600.

14 Q And sorry, couple, for the threshold items, if I
15 refer to the '122 patent and the '648 patent as the
16 challenged patents, do you understand that?

17 A I believe so. Challenged as part of these IPR
18 proceedings, yes.

19 Q And then finally, if I refer to the district
20 court litigation, do you understand that I'm referring to
21 the proceeding AGNC V. Nintendo Number 223CV00302 in the
22 Western District of Washington?

23 A I think so. I mean, I haven't memorized that
24 particular number, but I do understand that there's --
25 maybe a parallel would be a way to describe the proceeding

1 that is just as you described it.

2 Q Great.

3 So let's please turn to your declaration,
4 Exhibit 2019. And please turn to paragraph 57.

5 A Okay. I'm there.

6 Q And in paragraph 57, starting on page 21 of your
7 declaration, Exhibit 2019, do you see where you say, In my
8 opinion, a person of ordinary skill in the art would have
9 at least a Master's Degree in Electrical Or Electronics
10 Engineering and approximately five years of relevant
11 experience in the development of control systems for
12 inertial navigation, MEMS, semiconductor processing and
13 analog circuit design with additional educational
14 substituting for experience and vice versa, do you see
15 that?

16 A Yes. That's kind of the end of paragraph 50 --
17 57.

18 Q And so you mentioned here development of control
19 systems for inertial navigation. Can you elaborate on
20 what you mean by development of control systems for
21 inertial navigation?

22 A Yeah, well, inertial navigation systems are these
23 very complicated electromechanical systems that -- you
24 know, they use rotating bodies and multiple frames of
25 reference to determine angular rotation in perhaps

1 multiple axes, and they require pretty sophisticated, you
2 know, kind of controls to maintain their accuracy and, you
3 know, robustness to vibration.

4 And so I guess that's what I meant by that.
5 There's a whole, you know, domain of control system
6 mathematics and theory and practice that is -- has been
7 developed to make these devices work.

8 Q What is an example of the kind of experience a
9 person of ordinary skill would have had in the development
10 of control systems for inertial navigation?

11 A Well, you know, I -- you know, from an experience
12 perspective, there could be several different ways to do
13 this. I mean, you could have taken some courses in your
14 engineering background probably at the senior or graduate
15 level around inertial guidance design or advanced
16 engineering dynamics.

17 So there's course material that you could take
18 that would give you, I think, a very good background for
19 this, or you could have been working in a, you know, like
20 an engineering company that would require, you know,
21 guidance systems for various -- you know, various systems,
22 you know, like missile systems or automotive systems.

23 So if you had work experience in guidance and
24 navigation systems for these type of, you know, larger
25 aerospace terrestrial systems, then that would have been

1 also relevant experience. So it could have been a
2 combination of education or practical, you know,
3 professional experience.

4 Q And then turning back to your declaration,
5 Exhibit 2019, paragraph 57, we were just reviewing, so one
6 of the things you listed was MEMS semiconductor
7 processing. What do you mean by MEMS semiconductor
8 processing?

9 A Well, MEMS stands for microelectromechanical
10 systems, and MEMS are a class of devices, mechanical
11 devices really, that use -- or electromechanical devices
12 that use traditional semiconductor processing techniques
13 to -- for fabrication purposes.

14 And this was a big innovation in the late '80s
15 and during the '90s of using traditional semiconductor
16 techniques which are used to make transistors on computer
17 chips for these mechanical applications. And so these
18 MEMS devices use traditional semiconductor processing
19 techniques, but they also use some kind of novel and ad
20 hoc techniques for these particular MEMS systems.

21 And so I guess what I mean by MEMS semiconductor
22 processing is the suite of processing techniques and tools
23 that are used to build MEMS devices in a semiconductor
24 environment.

25 Q And so when you refer to MEMS semiconductor

1 processing, processing refers to industrial processing; is
2 that correct?

3 A Well, not really. No. I mean, processing, it's
4 a -- I guess it's a bit of jargon in the industry and in
5 the field. And basically what it means is, you know,
6 literally the process steps, you know, the deposition of
7 the films and the etching and the lithography, all the
8 detailed little steps that are required to make these
9 devices in a semiconductor fabrication facility.

10 It could be an industry, could be in academia.
11 It could be in a government lab.

12 Q And so you mentioned this experience could have
13 been in industry. What sorts of companies do you have in
14 mind for the kinds of experience that a person of ordinary
15 skill would have had in MEMS semiconductor processing?

16 A Well, a great example is, you know, Analog
17 Devices, which is a company that has, you know, pioneered
18 MEMS processing. They were doing it back in the 1990s,
19 and, you know, they continue to this day to make a variety
20 of, you know, very, very high volume MEMS sensors for all
21 of kinds of applications. So, you know, Analog Devices
22 was a great example.

23 There are also quite a few start-ups, you know,
24 in the kind of early '90s and mid-'90s that worked on MEMS
25 devices as well, so a variety of start-ups. And then a

1 big, established company which continues to this day is
2 Analog Devices.

3 Q And just to go back to that language we were
4 talking about before, development of control systems for
5 inertial navigation, do you have any examples of companies
6 in mind that -- where a person of ordinary skill would
7 have gained the relevant experience for development of
8 control systems for inertial navigation?

9 A Well, you know, a great example is Draper Labs in
10 Cambridge, who are kind of world leaders, you know, in
11 this area. And they developed a whole suite of --
12 they've actually been working on this for many, many
13 decades, and so in Draper Labs, it's a great example.
14 JPL, Jet Propulsion Lab out in Pasadena is another great
15 example.

16 And then, you know, within various aerospace
17 companies, you know, Raytheon, Hughes, which is where I
18 worked at that time, also had, you know, active efforts in
19 inertial navigation for a variety of applications.

20 Q Did you work on inertial navigation when you were
21 at Hughes?

22 A I did not work on inertial navigation. I did
23 work on control systems for, you know, missiles, but these
24 were kind of attitude and, you know, yaw, pitch and roll
25 control systems, but they weren't inertial navigation.

1 Q And so can you elaborate on that? So these were
2 yaw, pitch and attitude controls related to missile, but
3 they weren't inertial navigation. So what kind of systems
4 were these?

5 A Yeah, so one of the first things that I worked on
6 at Hughes was something called an autopilot, and I
7 actually published one or two papers on this in IEEE
8 Journal of Solid-State Circuits. And, you know, basically
9 you have a missile with a motor in the back that's pushing
10 it forward and then, you know, like control fins, you
11 know, like in the -- you know, you have like horizontal
12 control fins, and you have vertical control fins.

13 And you want to keep the missile going straight.
14 So the forces that you apply to these fins have to be
15 coupled to the inertial (indiscernible utterance)
16 navigation system in order to keep the missile going in
17 the right direction.

18 THE STENOGRAPHIC REPORTER: I'm sorry, Doctor, you're
19 speaking a bit fast. You said you have to apply these
20 fins to what?

21 THE WITNESS: You have to apply forces to these fins.
22 I'm sorry. I'll try to talk more slowly.

23 You have to apply, you know, forces to these fins
24 to keep the missile pointed in the appropriate direction.
25 And so there's a control system that actually controls,

1 you know, how fast you raise these fins or how fast you
2 lower them, and they're both horizontal and vertical. And
3 so there's actually a rather elaborate control system that
4 was required in order to keep basically the missile
5 pointed in the right direction.

6 And the necessary force will depend on the
7 velocity of the missile and its attitude and a whole host
8 of other things. So I worked on that control system, and
9 then I designed an analog chip to basically implement --
10 implement that algorithm. It was not an inertial control
11 algorithm. But it received input from that system because
12 the inertial system would kind of tell you where you were
13 in space. And you needed that input in order to guide the
14 missile forward.

15 BY MR. LAUPPE:

16 Q And when did you work at Hughes?

17 A I worked at Hughes from 1980 until 1996, and then
18 I did a summer internship there in 1970.

19 Q Okay. Now just to turn back to paragraph 57 of
20 your declaration, Exhibit 2019, that we were just talking
21 about, so another phrase you used in this sentence about a
22 person of ordinary skill in the art is analog circuit
23 design. What do you mean by analog circuit design?

24 A Well, in microelectronics, we typically receive
25 sensor signals from the world around us, and those signals

1 are analog in nature. They're continuous. They're not
2 discreet. They're not quantized. They're continuous in
3 nature.

4 And so analog circuit design is, I guess, the
5 science and the art of taking those signals from the world
6 around us in all forms, sensors, and actuators and all
7 kinds of things and then sensing them using electronics,
8 conditioning them appropriately, amplifying them, making
9 calculations with them all in the same -- all in the same
10 continuous, you know, time, nondiscrete, non-quantized
11 domain.

12 And so it uses transistors and capacitors and
13 inductors and resistors, and it's a branch of electronic
14 circuit design that deals with these continuous
15 quantities.

16 Q And so what kind of work experience would have
17 fallen into the category of analog circuit design?

18 A Well, from a work experience perspective, you
19 would have probably worked at a semiconductor design or
20 manufacturing company. You might have worked at a large
21 system company that designs these systems. You know,
22 those are the typically the two kind of major work-related
23 experience avenues.

24 So I mentioned before Analog Devices. So Analog
25 Devices is a great example. I mean, the name is in the --

1 analog is in the name of the company. So Analog Devices
2 is the name of a company that's focused pretty much
3 exclusively on analog circuit design, and so that's kind
4 of a company that's just focused on that.

5 When I was at Hughes, that was kind of my focus
6 too for many years, analog circuit design, and we were a
7 big system company that had lots of systems that needed
8 analog sensing and controls and all kinds of things. And
9 so that's how I got my experience.

10 Q What is an example of the kind of systems a
11 person of ordinary skill would have worked on in the
12 category of analog circuit design?

13 A What kind of systems? An example of the kind of
14 systems that a person would have worked in analog circuit
15 design, well, you know, oh, my gosh there are just an
16 amazing array.

17 So, of course, these accelerometers and, you
18 know, rotational sensors, analog and digital converters,
19 filters, hard drive controllers, communication systems,
20 you know, Wi-Fi, cellular, Bluetooth, sensors of all
21 kinds, light sensors, temperature sensors, in the medical
22 device field, you know, blood pressure sensors, heart rate
23 sensors, blood sugar, you know, MRI sensors.

24 The range of, you know, systems that use analog
25 circuit design as their, you know, kind of key components

1 are limitless.

2 Q And what are examples of control systems for
3 inertial navigation that existed that a person of ordinary
4 skill would have experience working on?

5 A Oh, well, you know, I would have to say that
6 every -- so inertial navigation or inertial guidance was
7 used in all kinds of systems, you know, in the time that
8 we're talking about in this patent, which I guess is the
9 late '90s and early 2000s. You know, there were planes,
10 you know, missile, satellites. These were the major
11 systems that you -- and then deep space. I think there
12 were deep space applications as well because the Jet
13 (indiscernible utterance) Propulsion Lab was involved.

14 THE STENOGRAPHIC REPORTER: I'm sorry, you said that
15 quite fast. Because the what was involved?

16 THE WITNESS: The Jet Propulsion Lab was involved in
17 inertial navigation control systems.

18 So I would have to say that any, you know, major
19 system company or provider that had -- that was building
20 things that had to move in space, particularly in the air
21 or in outer space had expertise in inertial guidance.

22 BY MR. LAUPPE:

23 Q What were the types of control systems for
24 inertial navigation?

25 A Well, I'm not sure what you mean by the types. I

1 mean, the types of control systems were -- were and are, I
2 think still, intermittently related to the mechanism that
3 you're using for -- the physical mechanism that you're
4 using for inertial control. You know, there are ring
5 laser gyros, and there are tuning fork gyros. And there
6 are these MEMS as well.

7 And so each of them has their own kind of unique
8 control system, you know, and, you know, various second
9 order effects that they're trying to compensate for that
10 would reduce the accuracy. But generally, you know, they
11 all have some mechanism for, you know, sensing rotation
12 and then -- creating rotation and then sensing that
13 rotation and then taking that sense data and using it to
14 make some kind of inference about acceleration, velocity
15 and position.

16 Q What textbooks would a person of ordinary skill
17 in the art have been familiar with?

18 A Yeah, I can't list any textbooks. I believe that
19 there are some specific gyroscope control textbooks that
20 are out there. I can't remember the name of any of them
21 in particular. But control, just general -- almost any
22 general control system textbook will have a section or a
23 chapter on gyroscopes.

24 You know, when I was an undergraduate and
25 graduate student, I had a famous controls textbook that I

1 used. It was blue. I can't remember that author's name.
2 But there are -- it's a pretty kind of well-known field.
3 I think there are a few specific textbooks for gyroscopes,
4 and then it is often covered more generally in control
5 systems textbooks.

6 Q And how about for MEMS semiconductor processing,
7 are there any textbooks that a person of ordinary skill
8 would have been familiar with?

9 A And do you mean at the time of these patents,
10 which would be the late '90s and early 2000s?

11 Q Correct.

12 A Yeah.

13 Q So again, I'm referring generally to what a
14 personal of ordinary skill in the art, as you understand
15 it, would have been familiar with.

16 A Yeah, at the early 2000s, late '90s. Yeah, so
17 that's a very good question. I'm trying to think.

18 You know, the MEMS field was quite new at that
19 time, and I'm not sure that there were any textbooks
20 available yet on MEMS semiconductor processing. I believe
21 there are now. But at the time, I'm not sure that there
22 were any. I can't think of any.

23 Q And for analog circuit design, are there any
24 textbooks that come to mind that a person of ordinary
25 skill would have been familiar with?

1 A So analog circuit design at that time was a more
2 mature field, and there were several pretty famous
3 textbooks that were available then. Grey and Meyer,
4 Analog Circuit Design comes to mind. There was also a
5 textbook by Sedra and Smith called Microelectronic
6 Circuits that was also very popular. So there were a
7 couple of very well-known and mature textbooks for analog
8 circuit design in those years.

9 Q So turning back to your declaration,
10 Exhibit 2019, please turn to paragraph 59.

11 A Okay, I'm there.

12 Q Great.

13 Do you see, starting at the second line where you
14 say, I had more than ten years of professional experience
15 in the analysis and design of high-performance MEMS
16 devices and control circuits prior to the priority date of
17 the American GNC patents. Do you see that?

18 A I do.

19 Q So high-performance MEMS devices and control
20 circuits existed for at least ten years before the
21 priority date of the '122 and '648 patents; is that
22 correct?

23 A Well, I had the experienced... yes. Yes, I
24 believe so.

25 Q So you discuss in your declaration your

1 experience with RF MEMS systems. Is that correct?

2 A Yes, that's correct.

3 Q What is an RF MEMS system?

4 A Well, an RF MEMS system is a MEMS device, a MEMS
5 system that controls and switches RF or radiofrequency
6 signals using the MEMS device. And it has an advantage
7 over traditional semiconductor devices used for this
8 control and switching. Because these MEMS devices exhibit
9 much better performance in certain, certain domains.

10 Q And so am I correct that RF MEMS devices are not
11 designed to perform inertial navigation; is that correct?

12 A Yeah, RF MEMS devices do not perform -- that's
13 not their function to perform inertial navigation. They
14 perform other functions.

15 Q Do you have experience with MEMS designed for
16 inertial navigation?

17 A Yeah, I've never designed a MEMS device for
18 inertial navigation applications.

19 Q So earlier, you were talking about some, a
20 control system you worked on for a missile system when you
21 were at Hughes; is that correct?

22 A Yes, that's correct.

23 Q So did that system involve MEMS devices?

24 A No. That -- just to put a time stamp on that,
25 that was in the 1980 through 1983 time frame which was in

1 some ways before MEMS had even been invented. So no, that
2 particular device did not involve MEMS.

3 Q Do you know of any MEMS inertial measurement
4 units, or IMUs, that were commercially available before
5 the priority date of the challenged patents?

6 A I'm not aware of any.

7 Q And do you know of any MEMS gyroscopes that were
8 commercially available before the priority date of the
9 challenged patents?

10 A Well, I know that Draper Labs was working on MEMS
11 gyroscopes during this time frame. I don't know if they
12 were commercially available, though. So I know that
13 people were working on it, but the commercial availability
14 was -- is unclear to me.

15 Q Please turn to paragraph 82 of your declaration,
16 Exhibit 2019.

17 A Okay, I'm there.

18 Q Great.

19 Do you see on the second line of paragraph 82,
20 where you say, There were few, if any, commercial products
21 on the market using MEMS technology, do you see that?

22 A I see that, yes.

23 Q And you're referring there to at the time of the
24 invention, correct?

25 A Yes, at the time of the invention.

1 Q What commercial products on the market using MEMS
2 technology from that time are you aware of?

3 A So in my own field of RF MEMS, there were quite a
4 few little start-ups that were very active during this
5 time frame. And, you know, one in particular that I know
6 was in Orange County. It was called WiSpry. And so I
7 would say in 2000, 1999 they had -- they were sampling
8 products to customers using their RF MEMS technology.

9 You know, so they were sampling them. I don't
10 know that they were commercially available, but they were
11 actively being sampled by various customers. At the same
12 time, I know Analog Devices was also working on some RF
13 MEMS, and they might have been also sampling some devices
14 at this time. So, you know, we're sort of in a time frame
15 where there's a lot of commercial interests and activity.

16 Companies are sampling products, and they're
17 checking things out with customers. And so they would
18 have either been commercially available or almost
19 commercially available.

20 Q What inertial navigation commercial products on
21 the market using MEMS technology from before the priority
22 date of the challenged patents are you aware of?

23 A And I'm sorry, inertial navigation MEMS or just
24 inertial navigation in general? I'm sorry, I missed your
25 question. Could you repeat your question?

1 Q Yeah, I'll just repeat.

2 A Yeah.

3 Q What inertial navigation commercial products on
4 the market using MEMS technology before the priority date
5 of the challenged patents are you aware of?

6 A Well, you know, as I said before, I'm not aware
7 of any. I know that, as I said, Draper was working on
8 this. There might have been commercially available
9 inertial navigation systems using MEMS. But I'm not -- I
10 wasn't aware of any. You know, these systems are much
11 more -- honestly they're much more complex than an RF MEMS
12 system and the RF MEMS systems were hard enough.

13 So I believe that the inertial navigation people
14 were still maybe struggling more in the research phase at
15 this time, rather than in a production phase.

16 Q So please turn to paragraph 47 of your
17 declaration, Exhibit 2019.

18 A Okay. I'm there. Paragraph 47.

19 Q And so starting at the top, do you see where you
20 say, Claim 1 of the '122 patent requires that the digital
21 signal processor receive and analyze the digital low
22 frequency inertial element displacement signals.

23 Do you see that?

24 A Yes, I do.

25 Q And then continuing, do you see where you say,

1 The patent describes and Figure 7 shows various examples
2 of the analysis that can be performed on the digital
3 signals. Do you see that?

4 A I do. Yes, I do, yes.

5 Q And then -- sorry, didn't mean to interrupt you.

6 And then do you see that you've reproduced
7 Figure 7 in paragraph 47?

8 A Yes. That's Figure 7 from the '122 patent.

9 Q Thank you.

10 And then continuing on, do you see where you say,
11 Claim 1 does not require a particular analysis from these
12 disclosed options but does require converting signals to
13 digital, analyzing them, and feeding back dither drive
14 signals to the angular rate sensor, do you see that?

15 A Yes, I do.

16 Q And so these disclosed options you're referring
17 to, those are what you can see in Figure 7, correct?

18 A Yes. These are the little boxes in Figure 7.

19 Q So it's your opinion that Claim 1 of the '122
20 patent doesn't require any particular analysis disclosed
21 in Figure 7, correct?

22 A Well, if I could take just a second, let me just
23 review Claim 1 of the '122. Just very quickly.

24 Q Sure.

25 MR. JOHANNINGMEIER: And I'll just say objection to

1 the question. Calling for a legal opinion, but...

2 MR. LAUPPE: Sorry, I didn't quite hear that.

3 MR. JOHANNINGMEIER: Sorry, just objection, for the
4 record to the question. Fine.

5 MR. LAUPPE: Okay, understood.

6 THE WITNESS: So thank you for giving me that
7 opportunity. Could you repeat your question, please?

8 BY MR. LAUPPE:

9 Q Yes, of course.

10 So it's your opinion that Claim 1 of the '122
11 patent doesn't require any particular analysis disclosed
12 in Figure 7, correct?

13 A Well, I think that Claim 1 provides a description
14 of the analysis and Figure 7 -- sorry, Claim 1 describes
15 the analysis that's required. And then Figure 7 is an
16 example of the kind of analysis that is required.

17 Q Are there other types of analysis, other than
18 what is disclosed in Figure 7, that would also satisfy
19 Claim 1 of the '122 patent?

20 MR. JOHANNINGMEIER: Objection; calls for a legal
21 conclusion.

22 THE WITNESS: Well, you know, Figure 7 is -- describes
23 a variety of things that have to be done to, you know,
24 receive the signal from the displacement and then create
25 the dither drive, but there are, you know, a variety of

1 other I might say control things that have to be done or
2 that might have to be done that are not included in
3 Figure 7. You know, there are various errors that these
4 MEMS gyroscopes are prone to.

5 And there might be additional blocks that are
6 added to Figure 7 to correct for those errors. So
7 Figure 7 is a very good general statement, but all I'm
8 saying is there may be additional things that would be
9 added for -- to correct for other, you know, errors or
10 problems.

11 BY MR. LAUPPE:

12 Q And so in your view, would those further error
13 checking or other steps that might be included in Figure 7
14 that you were just discussing, would those also satisfy
15 the analysis requirements of Claim 1 that you're
16 discussing in paragraph 47?

17 A Yes. You know, just -- Claim 1 just says the
18 digital signal processing system analyzing said digital
19 low frequency inertial element displacement signals and
20 feeding back said dither drive signals to said angular
21 rate sensor unit.

22 So within that claim, there's a whole set of
23 things that need to be done in order to make the system
24 work well, and those are shown in Figure 7, for example.

25 Q Have you heard of someone named William A. Clark?

1 A Well, I -- gosh, I used to work with him, a Bill
2 Clark at Hughes. I don't know if that's the same person.
3 I think it was actually William A. Clark, but it may not
4 be the same person you're referring to.

5 Q I'm going to introduce an exhibit. This might
6 take me a moment, sorry. This is going to be
7 Exhibit 1040, because I just want to stay consistent with
8 the exhibit numbering from the last depo.

9 (Whereupon Deposition Exhibit 1040
10 was marked for identification.)

11 BY MR. LAUPPE:

12 Q Yeah, I just dropped Exhibit 1040 into the chat.
13 And just for the record, Exhibit 1040 is the first page of
14 an international patent application to William A. Clark,
15 among others, with the Number WO 97/45699.

16 Let me know when you've got...

17 A Okay, yeah, I have to download it.

18 Q Okay.

19 A Bring it up.

20 MR. JOHANNINGMEIER: And I'll just object for the
21 record, since it's (indiscernible utterance) a new exhibit
22 and incomplete.

23 THE STENOGRAPHIC REPORTER: I'm sorry, it's a bit hard
24 to hear you, Corey. Could you repeat that?

25 MR. JOHANNINGMEIER: Oh, sorry. I'm far away from

1 my --

2 Objection to the extent this is a new exhibit and
3 also incomplete. But...

4 THE STENOGRAPHIC REPORTER: Thank you.

5 THE WITNESS: Okay. Yeah, this is not the William
6 Clark that I knew. I do see Roger Howe as a co-inventor.
7 And I very slightly know -- I certainly know who Roger
8 Howe is.

9 BY MR. LAUPPE:

10 Q Have you seen this patent application before,
11 Dr. Larson?

12 A I don't think so. And I just want to confirm
13 this is just one page; is that correct?

14 Q Correct.

15 A Okay. Yes. No, I have not seen this before.

16 Q Okay. And then I'm going to introduce another
17 exhibit. This is going to be Exhibit 1041.

18 (Whereupon Deposition Exhibit 1041
19 was marked for identification.)

20 BY MR. LAUPPE:

21 Q And just uploaded it to the chat. Exhibit 1041
22 is the first page of an article titled, Design of
23 Integrated MEMS by Bernhard E. Boser and Karen W. Markus.

24 MR. JOHANNINGMEIER: So same objections to this
25 exhibit.

1 THE WITNESS: And I know Bernhard Boser. I... I have
2 not seen this chapter before. I may have seen it in the
3 past. A little bit unclear.

4 BY MR. LAUPPE:

5 Q Okay. Then I'm going to introduce another
6 exhibit. Well, before I do, have you heard of Ashwin A.
7 Seshia, Dr. Larson?

8 A I don't believe so. No.

9 Q But you said you have heard of Roger T. Howe,
10 correct?

11 A Yes. Professor Howe's a professor at Cal at
12 Berkeley or was. He may be at Stanford, now. I'm sorry.
13 At the time he was at Berkeley.

14 Q And at the time, do you mean at the time of the,
15 you know, priority date of the challenged patents, is that
16 the time you're referring to?

17 A No, actually. At the time of the --
18 Exhibit 1040's disclosure which was, I think, 1996.

19 Q Gotcha.

20 Okay. I'm going to introduce another exhibit.
21 This is Exhibit 1042.

22 (Whereupon Deposition Exhibit 1042
23 was marked for identification.)

24 MR. LAUPPE: I just dropped it in the chat. And
25 Exhibit 1042 is the first page of U.S. Patent Number

1 6,250,156 to Ashwin A. Seshia and Roger T. Howe.

2 BY MR. LAUPPE:

3 Q And my question for you, Dr. Larson, is have you
4 seen this patent before?

5 MR. JOHANNINGMEIER: We have the same objections to
6 this exhibit.

7 THE WITNESS: It's a little bit hard to say. The
8 drawing itself looks familiar to me, but I can't say for
9 sure whether I've seen it before or not.

10 BY MR. LAUPPE:

11 Q And I'm going to introduce another exhibit.
12 Well, first, Dr. Larson, have you heard of Rand Hulsing?

13 A I don't believe I have.

14 Q I'm going to introduce an exhibit. This is
15 Exhibit 1043.

16 (Whereupon Deposition Exhibit 1043
17 was marked for identification.)

18 BY MR. LAUPPE:

19 Q And this is the first page of an article titled,
20 MEMS Inertial Rate and Acceleration Sensor by Rand
21 Hulsing. And so again, same question, Dr. Larson, have
22 you seen this article before?

23 MR. JOHANNINGMEIER: Sorry, we have the same
24 objections to this exhibit.

25 THE WITNESS: You know, this article does look

1 familiar to me. And I think I reviewed it.

2 No, I'm sorry. No, I have not seen this article
3 before. I have not seen this article.

4 BY MR. LAUPPE:

5 Q Okay. And, Dr. Larson, just to go back to
6 Exhibit 1041, you mentioned you may have seen this in the
7 past. But my question is: You don't recall having
8 analyzed this for your declaration in these proceedings,
9 correct?

10 A That's correct. To me, this looks like perhaps a
11 chapter from an early book on MEMS and, you know, I was
12 reading those books at the time. So that's why it sort of
13 looks familiar to me. But I don't have any date or title
14 information from you to, you know, make it more precise.

15 Q And then to go back to Exhibit 1042, you
16 mentioned you can't say for sure whether you've seen this
17 exhibit before or not. My question to you is: You don't
18 recall having analyzed Exhibit 1042 for your declaration
19 to these proceedings, correct?

20 A That's correct. I did not use this for analyzing
21 for my declaration.

22 Q So I know we're coming up on an hour, Dr. Larson,
23 so I want to give you an opportunity to take a break.
24 However, I also don't have much left. So if you want to
25 just get through the rest and then get on with your day,

1 that's perfectly fine with me. But I also just wanted to
2 give you that opportunity.

3 A Thank you, thank you very much. I think I'm good
4 for another 30 minutes at least.

5 Q Okay. Great. I don't think I'll even have that.
6 So...

7 A Okay, thank you for that opportunity.

8 Q Of course.

9 So, Dr. Larson, are you familiar with the concept
10 of a mixed-signal system?

11 A Yes, I'm familiar with that concept.

12 Q What is a mixed-signal system?

13 A Well, a mixed-signal system is an electronic
14 system that contains both analog and digital circuits.
15 And they're used, typically, together. Because, you know,
16 each by itself is inadequate for the purposes at hand.

17 But when you put them together, the overall
18 functionality is greatly enhanced.

19 Q What are the circumstances in which, you know,
20 each of analog circuitry and digital circuitry alone
21 wouldn't be sufficient, like can you think of any
22 examples?

23 A Well, yes. There are many, many examples. You
24 know, for example, like communication systems,
25 communication systems use analog circuits to communicate

1 to the antennas and to communicate to the outside world,
2 but then there's a very, very sophisticated communications
3 protocol that is highly complex that these communication
4 devices have to obey and adhere to.

5 And so by mixing -- so you need a digital system
6 in order to handle this very complicated digital
7 communications protocol. And you need an analog system in
8 order to communicate with the outside world effectively.
9 And so you merge the two together, and -- into a
10 mixed-signal system, and the resulting performance is
11 excellent.

12 You know, more -- in a more maybe fine-grained
13 example, analog digital converters take analog signals and
14 convert them into ones and zeros. And that's a conical
15 example of a mixed-signal system. So there are many, many
16 examples.

17 Q Have you worked on mixed-signal systems?

18 A Yes. I worked on many mixed-signal systems.
19 I've worked on data converters, both analog to digital and
20 digital to analog. I've worked on communication systems
21 that, which I mentioned before, had these mix of analog
22 and digital circuits to work very well. So yeah, I've
23 worked on quite a few mixed-signal systems over the years.

24 Q Did you work on any mixed-signal systems before
25 the priority date of the challenged patents?

1 A Yes. You know, I mentioned analog -- actually,
2 all of the systems that I mentioned, I worked on for the
3 priority date of the patent.

4 For example, when I was at Hughes in the
5 mid-'90s, I was one of the engineers on the first direct
6 TV satellite system, and we did both the analog and the
7 digital. We did the whole analog and digital system
8 together. They had to be designed together. So that was
9 a very sophisticated example of a mixed-signal system.

10 Q So what are the advantages of incorporating
11 digital circuitry into an analog system?

12 A Well, analog systems are very precise. They're
13 very low noise. They have very large dynamic range. But
14 they are not very flexible. And digital systems are kind
15 of infinitely flexible. You can program them with
16 software, or you can use a variety of, you know,
17 programming techniques.

18 So, you know, basically, you know, we use digital
19 systems to enhance the flexibility and maybe
20 sophistication of the signal processing that we do on
21 these analog signals that we receive from the outside
22 world.

23 Q What do you mean by sophistication of the signal
24 processing?

25 A Well, there are -- I'm not -- let me, you know,

1 think of a good example. The -- like in communication
2 systems, for example, you have to be able to take, you
3 know, the data that's received from an antenna, and you
4 have to turn it into a bunch of ones and zeros according
5 to a very sophisticated protocol.

6 And that protocol actually changes all the time.
7 Because standards, bodies, and carriers evolve and change
8 the way that they transmit data back and forth. So you
9 need a system that can take this kind of fixed analog. We
10 call it a front end. Another way to say it maybe would be
11 an interface, to take this analog interface and then
12 flexibly take the data from that analog interface and turn
13 it into ones and zeros according to a sophisticated
14 protocol that's changing all the time.

15 In the context of these, you know, inertial
16 systems that we're talking about here, the control system
17 requirements are very sophisticated. You have to have a
18 correct frequency. You have to correct for various
19 errors. And these, these errors and the frequency changes
20 evolve over time. They evolve with temperature.

21 And so a sophisticated digital control algorithm
22 is a very useful thing to be able to effectively control
23 these systems. So the two examples that I gave are, you
24 know, communication system and then these inertial
25 systems.

1 Q And so I'm going to introduce an exhibit. This
2 is going to be Exhibit 1044.

3 (Whereupon Deposition Exhibit 1044
4 was marked for identification.)

5 BY MR. LAUPPE:

6 Q One moment.

7 Okay. I just dropped this into the chat.
8 Exhibit 1044 is an article -- a 1988 article titled,
9 State-of-the-Art and Future Prospects For Analog Signal
10 Processing, A Tutorial on which you are listed as an
11 author, Dr, Larson, along with Gabor C. Temes and
12 Kenneth W. Martin. And do you recognize Exhibit 1044,
13 Dr. Larson?

14 MR. JOHANNINGMEIER: Wait, hold on. Before you
15 answer, we object that this is new, but you can answer
16 questions.

17 THE WITNESS: Yes, I do recognize this. And Professor
18 Temes was my PhD advisor at UCLA, and Professor Martin was
19 a faculty member there.

20 BY MR. LAUPPE:

21 Q So you were an author on Exhibit 1044, correct?

22 A I'm a coauthor, correct.

23 Q Thank you.

24 And do you see the paragraph under the heading,
25 Introduction on the first page?

1 A Yes.

2 Q And do you see where that paragraph reads, Signal
3 processing, switching, and control functions increasingly
4 use digital techniques. This is due to the accuracy,
5 flexibility, programmability, and modularity of digital
6 systems, do you see that?

7 A I do.

8 Q So previously we were discussing flexibility of
9 digital systems, but I wanted to ask you about basically
10 the other things listed here. So in what way are digital
11 systems -- in what way is accuracy an advantage of digital
12 systems?

13 A Well, digital systems are accurate in the sense
14 that, well, you know, they're digital. They only -- they
15 have a certain discreet quantized set of steps, and they
16 don't ever deviate from those. So, you know, if you -- in
17 a digital system, if you add three plus two, you always
18 get exactly five.

19 And digital systems are not subject to any
20 inaccuracy in that particular calculation. So I think
21 that's what we meant by accuracy in that case.

22 Q And how is programmability an advantage of
23 digital systems?

24 A Well, as I mentioned before, you know, digital
25 systems are kind of -- their operation can be changed

1 under software or firmware control, and so I think
2 programmability there is kind of a euphemism for the
3 ability to software or firmware or even perhaps a simple
4 mask change to control their function.

5 Q And how is modularity an advantage of digital
6 systems?

7 A Well, I think by modularity what we mean there is
8 that there are digital blocks that are commonly used in a
9 variety of systems. You know, simple example might be
10 like an add or, you know, which adds two numbers. And
11 that little block in the circuit can be reused for
12 multiple different applications. It's a module that can
13 be used for a variety of applications.

14 And so that kind of modularity allows widespread
15 use of, you know, prebuilt components for, you know, quick
16 and accurate assembly of an overall system.

17 Q And then previously, you were discussing
18 flexibility, but, you know, just -- and so maybe you've
19 covered this, but just to clarify, so how is flexibility
20 an advantage of digital systems?

21 A Well, I gave you that example of the
22 communications protocols, and I think that's a great
23 example. You know, the -- these protocols are changing
24 all the time in response to a variety of requirements at
25 the system level. And you want the hardware that you've

1 built to be able to adapt to that changing circumstance.

2 And digital systems by virtue of the things that
3 we talked about, their flexibility and -- sorry, their
4 programmability, into software control, allow for this
5 adaptation to the changing (indiscernible utterance)
6 environment.

7 THE STENOGRAPHIC REPORTER: I'm sorry, you said
8 adaptation to the changing what?

9 THE WITNESS: Environment, sorry.

10 THE STENOGRAPHIC REPORTER: Thank you.

11 BY MR. LAUPPE:

12 Q And then you see, Dr. Larson, you continue the
13 sentence by saying -- also let's just start the sentence
14 over. You see, This is due to the accuracy, flexibility,
15 programmability and modularity of digital systems in
16 addition to the high levels of integration achievable in
17 modern digital integrated circuits. What do you mean by
18 high levels of integration achievable in modern digital
19 integrated circuits?

20 A Well, historically, for many, many decades, we've
21 been able to put more and more transistors on digital
22 chips. And, you know, now we're up to, you know, several
23 billion, you know, on the largest processor available. So
24 this is a result of something called Moore's Law, which
25 has been, you know, a law of nature for the last several

1 decades. And we're basically just referring to the fact
2 here that digital systems in particular can take advantage
3 of Moore's Law by putting more and more transistors on an
4 integrated circuit.

5 And if you can put more and more transistors on
6 the circuit, you can do more and more things with them.

7 Q And then do you see -- continuing on in this
8 paragraph, do you see where you say, As a result, in many
9 signal processors with analog inputs and outputs, the
10 majority of the components are becoming digital with only
11 a relatively few functions remaining in analog form.
12 These analog circuits usually include the S/H preamplifier
13 input/output buffers, pre- and post-filter equalizers,
14 multiplexer/demultiplexer stages and A to D and D to A
15 converters.

16 And then finally, These circuits are necessary
17 for conditioning an analog input signal for digital
18 manipulation or a digital output signal for analog
19 transmission, do you see that?

20 A I do, yes.

21 Q So what does this mean by, These circuits are
22 necessary for conditioning an analog input signal for
23 digital manipulation or a digital output signal for analog
24 transmission?

25 A Well, when you convert an analog signal into

1 digital form, you have to be very careful not to corrupt
2 the signal as part of that process. And there are a
3 variety of ways that it could be corrupted.

4 The most common, I think, is something called
5 aliasing where higher frequency signals get -- can kind of
6 corrupt low frequency signals. And so before the signals
7 themselves get converted into digital form, these high
8 frequency signals have to be removed. And those are done
9 with the analog circuits.

10 So we talk about pre- and post-filter equalizers
11 in the sentence. That's a great example. And then we
12 talk about other various circuit blocks here that are
13 needed to kind of condition the signal to be digitized.
14 And then on the flip side, when you convert a digital
15 signal back to analog, it can also be corrupted. And so
16 you need to have a variety of circuits to prevent that
17 corruption from occurring as well.

18 So these are, I think, sometimes called signal
19 conditioning circuits, and we mention that in this
20 paragraph.

21 Q Okay. Thank you, Dr. Larson. That's all the
22 questions I have for this morning.

23 A Thank you.

24 MR. JOHANNINGMEIER: We have no questions.

25 THE STENOGRAPHIC REPORTER: Before we go off the

1 record, Corey, I just want to confirm your copy order of
2 this transcript.

3 MR. JOHANNINGMEIER: Oh, I don't know that we need a
4 copy. I think, I mean --

5 THE STENOGRAPHIC REPORTER: How about I'll email you,
6 and you can just email me back? But right now, it's not a
7 copy order, correct?

8 MR. JOHANNINGMEIER: Right, right.

9 THE STENOGRAPHIC REPORTER: Okay. Perfect.

10 And, Patrick, we have your standing order for
11 this case. Thank you so much.

12 THE TECHNICIAN: Counsel, did you want those exhibits
13 attached?

14 MR. LAUPPE: Yes, please.

15 (WHEREUPON THE DEPOSITION WAS
16 CONCLUDED AT 7:13 A.M.,
17 PACIFIC STANDARD TIME.)

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1 Please be advised I have read the
2 foregoing deposition, pages 1 through
3 49, inclusive.
4 I hereby state there are:

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8 (Check one) _____ no corrections

9

10 _____ corrections per attached

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DR. LAWRENCE LARSON

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WITNESS'S CHANGES OR CORRECTIONS

NOTE: If you are adding to your testimony, print the exact words you want to add. If you are deleting from your testimony, print the exact words you want to delete. Specify with "Add" or "Delete" and sign this form.

Deposition of: DR. LAWRENCE LARSON
Case Title: NINTENDO V. GNC
Date of Deposition: MARCH 28, 2025

I, _____ have
the following corrections to make to my deposition:

Page Line Change/Add/Delete

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CERTIFICATE OF SHORTHAND REPORTER/STENOGRAPHER

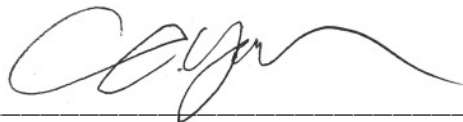
I, Christa Yan, Certified Shorthand/Stenographic Reporter within and for the State of California do hereby certify: That, DR. LAWRENCE LARSON, the Witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken before me and is a true record of the testimony given by such witness.

I further certify that the parties were represented by counsel at the remote deposition.

I further certify that the deposition of Dr. Lawrence Larson occurred remotely on March 28th, 2025, commencing at 5:58 a.m. to 7:13 a.m.

I further certify that I am not related to any of the parties to this action by blood or marriage, I am not employed by or an attorney to any of the parties to this action, and that I am in no way interested, financially or otherwise, in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of April 2025



CERTIFIED SHORTHAND/STENOGRAPHIC REPORTER

IN AND FOR THE STATE OF CALIFORNIA

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42:3	13:19	17:10, 17:11,	4:8, 11:13,
able	adapt	39:21	14:16, 14:21,
39:2, 39:22,	43:1	aliasing	15:2, 17:9,
43:1, 43:21	adaptation	45:5	17:22, 17:23,
about	43:5, 43:8	all	18:1, 18:4,
7:19, 8:4,	add	7:24, 14:7,	18:17, 18:24,
8:11, 9:5, 15:4,	41:17, 42:10,	14:20, 18:6,	19:1, 19:3,
17:21, 20:8,	48:4, 48:6,	18:9, 19:8,	19:6, 19:8,
21:14, 22:6,	48:15	19:20, 20:7,	19:12, 19:14,
24:19, 39:16,	added	21:11, 30:7,	19:18, 19:24,
41:9, 43:3,	30:6, 30:9	38:2, 39:6,	22:23, 23:1,
45:10, 45:12,	adding	39:14, 42:24,	23:4, 23:7,
46:5	48:3	45:21	26:12, 36:14,
academia	addition	allow	36:20, 36:25,
14:10	43:16	43:4	37:7, 37:13,
acceleration	additional	allows	37:19, 37:20,
21:14, 34:20	11:13, 30:5,	42:14	37:21, 38:1,
accelerometers	30:8	almost	38:6, 38:7,
19:17	adds	21:21, 26:18	38:11, 38:12,
accordance	42:10	alone	38:21, 39:9,
5:7	adhere	36:20	39:11, 39:12,
according	37:4	along	40:9, 44:9,
39:4, 39:13	advance	40:11	44:11, 44:12,
accuracy	5:23	also	44:17, 44:18,
12:2, 21:10,	advanced	2:16, 8:20,	44:22, 44:23,
41:4, 41:11,	12:15	13:1, 13:19,	44:25, 45:9,
41:21, 43:14	advantage	14:23, 15:18,	45:15
accurate	24:6, 41:11,	23:4, 23:6,	analysis
41:13, 42:16	41:22, 42:5,	26:12, 26:13,	23:15, 28:2,
achievable	42:20, 44:2	29:18, 30:14,	28:11, 28:20,
43:16, 43:18	advantages	32:3, 35:24,	29:11, 29:14,
action	38:10	36:1, 43:13,	29:15, 29:16,
49:15, 49:17	advised	45:15	29:17, 30:15
active	47:1	alto	analyze
15:18, 26:4	advisor	2:6	27:21
actively	40:18	always	analyzed
26:11	aerospace	41:17	35:8, 35:18
activity	12:25, 15:16	amazing	analyzing
26:15	again	19:16	28:13, 30:18,
actually	8:2, 10:9,	america	35:20
15:12, 16:7,	22:13, 34:21	1:6	angular
16:25, 17:3,	agnc	american	11:25, 28:14,
31:3, 33:17,	8:1, 10:21	1:9, 6:4, 23:17	30:20
38:1, 39:6	ago	among	another
actuators	8:4	31:15	5:13, 15:14,
18:6	air	amplifying	17:21, 32:16,
	20:20	18:8	33:5, 33:20,

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

51

34:11, 36:4, 39:10 answer 40:15 antenna 39:3 antennas 37:1 anticipate 5:11 any 5:14, 5:23, 7:20, 8:13, 15:5, 20:18, 21:18, 21:20, 21:21, 22:7, 22:19, 22:22, 22:23, 25:3, 25:6, 25:7, 25:20, 27:7, 27:10, 28:20, 29:11, 35:13, 36:21, 37:24, 41:19, 49:14, 49:16 anybody 7:14 anyone 5:25 apologize 5:23 appeal 1:3 appearances 2:1 appeared 5:5 application 4:4, 31:14, 32:10 applications 13:17, 14:21, 15:19, 20:12, 24:18, 42:12, 42:13 apply 16:14, 16:19, 16:21, 16:23	appropriate 16:24 appropriately 18:8 approximately 11:10 april 49:20 area 15:11 around 12:15, 17:25, 18:6 array 19:16 art 11:8, 17:22, 18:5, 21:17, 22:14 article 32:22, 34:19, 34:22, 34:25, 35:2, 35:3, 40:8 ashwin 33:6, 34:1 assembly 42:16 attached 46:13, 47:10 attending 5:10 attitude 15:24, 16:2, 17:7 attorney 49:16 author 40:11, 40:21 author's 22:1 automotive 12:22 autopilot 16:6 availability 25:13 available 22:20, 23:3,	25:4, 25:8, 25:12, 26:10, 26:18, 26:19, 27:8, 43:23 avenues 18:23 aware 5:13, 25:6, 26:2, 26:22, 27:5, 27:6, 27:10 away 5:15, 31:25 axes 12:1 B b1 1:13 b2 1:15 back 8:24, 13:4, 14:18, 15:3, 16:9, 17:19, 23:9, 28:13, 30:20, 35:5, 35:15, 39:8, 45:15, 46:6 background 12:14, 12:18 backup 5:14 basically 14:5, 16:8, 17:4, 17:9, 38:18, 41:9, 44:1 because 17:11, 20:12, 20:15, 24:8, 31:7, 36:15, 39:7 becoming 44:10 been 6:15, 6:17, 6:19, 7:7, 12:6,	12:19, 12:25, 13:1, 14:13, 15:12, 21:17, 22:8, 22:15, 22:25, 25:1, 26:13, 26:18, 27:8, 43:21, 43:25 before 1:3, 5:3, 5:20, 6:2, 6:15, 6:20, 15:4, 18:24, 23:20, 25:1, 25:4, 25:8, 26:21, 27:4, 27:6, 32:10, 32:15, 33:2, 33:6, 34:4, 34:9, 34:22, 35:3, 35:17, 37:21, 37:24, 40:14, 41:24, 45:6, 45:25, 49:5, 49:7 beginning 10:11 behalf 6:8 being 6:8, 26:11 believe 8:15, 8:16, 9:11, 10:17, 21:18, 22:20, 23:24, 27:13, 33:8, 34:13 berkeley 33:12, 33:13 bernhard 32:23, 33:1 best 5:12 better 24:9 big 13:14, 15:1, 19:7 bill 31:1
---	--	--	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

52

billion 43:23	bunsow 2:10, 6:4	cellular 19:20	17:23, 18:4,
bit 14:4, 16:19, 31:23, 33:3, 34:7	C	certain 24:9, 41:15	18:14, 18:17,
block 42:11	ca 2:6	certainly 32:7	19:3, 19:6,
blocks 30:5, 42:8, 45:12	cal 33:11	certificate 3:6, 49:1	19:12, 19:14,
blood 19:22, 19:23, 49:15	calculation 41:20	certified 5:4, 49:2, 49:24	19:25, 22:23,
blue 22:1	calculations 18:9	certify 49:3, 49:9, 49:11, 49:14	23:1, 23:4,
bluetooth 19:20	california 2:13, 5:4, 5:7, 49:3, 49:25	challenged 10:16, 10:17, 25:5, 25:9, 26:22, 27:5, 33:15, 37:25	23:8, 42:11, 44:4, 44:6, 45:12
board 1:3	call 39:10	change 39:7, 42:4, 48:15	circuitry 36:20, 38:11
bodies 11:24, 39:7	called 6:8, 7:8, 16:6, 23:5, 26:6, 43:24, 45:4, 45:18	changed 41:25	circuits 16:8, 23:6, 23:16, 23:20, 36:14, 36:25, 37:22, 43:17, 43:19, 44:12, 44:16, 44:21, 45:9, 45:16, 45:19
book 35:11	calling 29:1	changes 3:5, 39:6, 39:19, 48:1	circumstance 43:1
books 35:12	calls 29:20	changing 39:14, 42:23, 43:1, 43:5, 43:8	circumstances 36:19
boser 32:23, 33:1	cambridge 15:10	chapter 21:23, 33:2, 35:11	cited 7:12
both 17:2, 36:14, 37:19, 38:6	camino 2:12	chat 8:7, 8:19, 31:12, 32:21, 33:24, 40:7	city 2:13
boxes 28:18	can't 7:1, 7:3, 8:2, 10:10, 21:18, 21:20, 22:1, 22:22, 34:8, 35:16	check 8:15, 47:8	claim 27:20, 28:11, 28:19, 28:23, 29:10, 29:13, 29:14, 29:19, 30:15, 30:17, 30:22
branch 18:13	capacitors 18:12	checking 26:17, 30:13	clarify 42:19
break 35:23	careful 45:1	chip 17:9	clark 30:25, 31:2, 31:3, 31:14, 32:6
bring 31:19	carriers 39:7	chips 13:17, 43:22	class 13:10
buffers 44:13	case 41:21, 46:11, 48:10	christa 1:24, 5:3, 49:2	clean 8:16, 8:17
build 13:23	category 18:17, 19:12	circuit 11:13, 17:22,	co-inventor 32:6
building 20:19	cause 5:6		coauthor 40:22
built 43:1			
bunch 39:4			

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

53

code 5:7	compensate 21:9	continuous 18:1, 18:2, 18:10, 18:14	31:24, 46:1
combination 13:2	completely 8:17	control 11:11, 11:18, 11:20, 12:5, 12:10, 15:4, 15:8, 15:23, 15:25, 16:10, 16:12, 16:25, 17:3, 17:8, 17:10, 20:2, 20:17, 20:23, 21:1, 21:4, 21:8, 21:19, 21:21, 21:22, 22:4, 23:16, 23:19, 24:8, 24:20, 30:1, 39:16, 39:21, 39:22, 41:3, 42:1, 42:4, 43:4	corner 9:6
come 22:24	complex 27:11, 37:3	controllers 19:19	corporation 1:9
comes 23:4	complicated 11:23, 37:6	controls 12:2, 16:2, 16:25, 19:8, 21:25, 24:5	correct 8:14, 9:7, 9:14, 14:2, 22:11, 23:22, 24:1, 24:2, 24:10, 24:11, 24:21, 24:22, 25:24, 28:17, 28:21, 29:12, 30:6, 30:9, 32:13, 32:14, 33:10, 35:9, 35:10, 35:19, 35:20, 39:18, 40:21, 40:22, 46:7
coming 35:22	complimentary 5:21	conversations 5:17	corrections 3:5, 47:8, 47:10, 48:1, 48:14
commencement 49:6	components 19:25, 42:15, 44:10	convert 37:14, 44:25, 45:14	corresponds 9:12, 9:13
commencing 49:12	computer 5:15, 13:16	converted 45:7	corrupt 45:1, 45:6
commercial 25:13, 25:20, 26:1, 26:15, 26:20, 27:3	concept 36:9, 36:11	converters 19:18, 37:13, 37:19, 44:15	corrupted 45:3, 45:15
commercially 25:4, 25:8, 25:12, 26:10, 26:18, 26:19, 27:8	concluded 46:16	converting 28:12	corruption 45:17
common 45:4	conclusion 29:21	cooley 2:3	could 12:12, 12:13, 12:17, 12:19, 13:1, 14:10, 14:11, 14:12, 26:25, 28:22, 29:7, 31:24, 45:3
commonly 42:8	condition 45:13	copy 8:10, 8:13, 8:16, 8:20, 9:18, 46:1, 46:4, 46:7	counsel 46:12, 49:10
communicate 36:25, 37:1, 37:8	conditioning 18:8, 44:17, 44:22, 45:19	corey 2:11, 6:3,	county 26:6
communication 19:19, 36:24, 36:25, 37:3, 37:20, 39:1, 39:24	confirm 9:12, 32:12, 46:1		couple 10:14, 23:7
communications 37:2, 37:7, 42:22	conical 37:14		coupled 16:15
companies 14:13, 15:5, 15:17, 26:16	connect 5:19		
company 7:8, 12:20, 14:17, 15:1, 18:20, 18:21, 19:1, 19:2, 19:4, 19:7, 20:19	connecting 5:19		
	consistent 31:7		
	contains 36:14		
	context 39:15		
	continue 14:19, 43:12		
	continues 15:1		
	continuing 27:25, 28:10, 44:7		

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

54

course 12:17, 19:17, 29:9, 36:8 courses 12:13 court 10:20 covered 22:4, 42:19 create 29:24 creating 21:12 csr 1:24 customers 26:8, 26:11, 26:17 cv 10:21	9:6, 11:3, 11:7, 13:4, 17:20, 23:9, 23:25, 25:15, 27:17, 35:8, 35:18, 35:21 deep 20:11, 20:12 degree 11:9 delete 48:6, 48:7, 48:15 deleting 48:5 demultiplexer 44:14 depend 17:6 depo 31:8 deposed 6:15, 6:17 deposition 1:17, 5:22, 7:10, 7:15, 7:17, 8:8, 14:6, 31:9, 32:18, 33:22, 34:16, 40:3, 46:15, 47:2, 48:9, 48:11, 48:14, 49:4, 49:6, 49:10, 49:11 describe 10:25 described 11:1 describes 28:1, 29:14, 29:22 description 29:13 design 4:5, 11:13, 12:15, 17:23, 18:4, 18:14, 18:17, 18:19,	19:3, 19:6, 19:12, 19:15, 19:25, 22:23, 23:1, 23:4, 23:8, 23:15, 32:22 designed 17:9, 24:11, 24:15, 24:17, 38:8 designs 18:21 detailed 10:9, 14:8 determine 11:25 developed 12:7, 15:11 development 11:11, 11:18, 11:20, 12:9, 15:4, 15:7 deviate 41:16 device 19:22, 24:4, 24:6, 24:17, 25:2 devices 12:7, 13:10, 13:11, 13:18, 13:23, 14:9, 14:17, 14:21, 14:25, 15:2, 18:24, 18:25, 19:1, 23:16, 23:19, 24:7, 24:8, 24:10, 24:12, 24:23, 26:12, 26:13, 37:4 different 12:12, 42:12 digital 19:18, 27:20, 27:21, 28:2, 28:13, 30:18, 36:14, 36:20,	37:5, 37:6, 37:13, 37:19, 37:20, 37:22, 38:7, 38:11, 38:14, 38:18, 39:21, 41:4, 41:5, 41:9, 41:10, 41:11, 41:13, 41:14, 41:17, 41:19, 41:23, 41:24, 42:5, 42:8, 42:20, 43:2, 43:15, 43:17, 43:18, 43:21, 44:2, 44:10, 44:17, 44:18, 44:23, 45:1, 45:7, 45:14 digitized 45:13 direct 38:5 direction 16:17, 16:24, 17:5 disclosed 28:12, 28:16, 28:20, 29:11, 29:18 disclosure 33:18 discreet 18:2, 41:15 discuss 23:25 discussing 30:14, 30:16, 41:8, 42:17 discussions 5:15 displacement 27:22, 29:24, 30:19 district 10:19, 10:22 dither 28:13, 29:25,
D			
data 21:13, 37:19, 39:3, 39:8, 39:12 date 7:2, 8:3, 10:8, 23:16, 23:21, 25:5, 25:8, 26:22, 27:4, 33:15, 35:13, 37:25, 38:3, 48:11 day 5:1, 5:3, 14:19, 15:1, 35:25, 49:20 de 2:10, 6:4 deals 18:14 decades 15:13, 43:20, 44:1 declaration 4:3, 7:11, 7:12, 7:23, 8:6,			

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

55

30:20 doctor 16:18 documents 7:20, 7:24 doing 14:18 domain 12:5, 18:11 domains 24:9 done 29:23, 30:1, 30:2, 30:23, 45:8 download 31:17 dr 1:18, 5:5, 6:7, 6:13, 32:11, 33:7, 34:3, 34:12, 34:21, 35:5, 35:22, 36:9, 40:11, 40:13, 43:12, 45:21, 47:14, 48:9, 49:4, 49:11 draft 8:22, 8:24 draper 15:9, 15:13, 25:10, 27:7 drawing 34:8 drive 19:19, 28:13, 29:25, 30:20 dropped 31:12, 33:24, 40:7 due 41:4, 43:14 duly 6:9, 49:5 during 13:15, 25:11, 26:4	dynamic 38:13 dynamics 12:16 E each 5:20, 21:7, 36:16, 36:20 earlier 24:19 early 14:24, 20:9, 22:10, 22:16, 35:11 education 13:2 educational 11:13 effectively 37:8, 39:22 effects 21:9 efforts 15:18 eight 6:18 either 26:18 el 2:12 elaborate 11:19, 16:1, 17:3 electrical 11:9 electromechanical 11:23, 13:11 electronic 18:13, 36:13 electronics 11:9, 18:7 element 27:22, 30:19 email 46:5, 46:6 employed 49:16	enabled 5:17 end 11:16, 39:10 engaged 8:1 engineering 11:10, 12:14, 12:16, 12:20 engineers 38:5 enhance 38:19 enhanced 36:18 enough 27:12 entity 7:5 environment 13:24, 43:6, 43:9 equalizers 44:13, 45:10 error 30:12 errors 30:3, 30:6, 30:9, 39:19 esq 2:4, 2:11 established 15:1 etching 14:7 euphemism 42:2 even 6:23, 25:1, 36:5, 42:3 ever 41:16 every 20:6 everyone 5:10 evolve 39:7, 39:20	exact 7:1, 8:2, 48:4, 48:5 exactly 41:18 examination 6:11 examinations 3:1 examined 5:5 example 12:8, 14:16, 14:22, 15:9, 15:13, 15:15, 18:25, 19:10, 19:13, 29:16, 30:24, 36:24, 37:13, 37:15, 38:4, 38:9, 39:1, 39:2, 42:9, 42:21, 42:23, 45:11 examples 15:5, 20:2, 28:1, 36:22, 36:23, 37:16, 39:23 excellent 37:11 exclusively 19:3 exhibit 4:2, 4:3, 4:4, 4:5, 4:6, 4:7, 4:8, 8:5, 8:6, 8:8, 8:19, 8:22, 11:4, 11:7, 13:5, 17:20, 23:10, 24:8, 25:16, 27:17, 31:5, 31:7, 31:8, 31:9, 31:12, 31:13, 31:21, 32:2, 32:17, 32:18, 32:21, 32:25, 33:6, 33:18,
--	---	--	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

56

33:20, 33:21, 33:22, 33:25, 34:6, 34:11, 34:14, 34:15, 34:16, 34:24, 35:6, 35:15, 35:17, 35:18, 40:1, 40:2, 40:3, 40:8, 40:12, 40:21 exhibits 7:12, 7:24, 46:12 existed 20:3, 23:20 experience 11:11, 11:14, 12:8, 12:11, 12:23, 13:1, 13:3, 14:12, 14:14, 15:7, 18:16, 18:18, 18:23, 19:9, 20:4, 23:14, 24:1, 24:15 experienced 23:23 expert 6:19, 6:25, 7:5 expertise 20:21 extent 32:2	34:8, 35:1, 35:13, 36:9, 36:11 famous 21:25, 23:2 far 31:25 fast 16:19, 17:1, 20:15 feeding 28:13, 30:20 few 8:25, 14:23, 22:3, 25:20, 26:4, 37:23, 44:11 field 14:5, 19:22, 22:2, 22:18, 23:2, 26:3 figure 28:1, 28:7, 28:8, 28:17, 28:18, 28:21, 29:12, 29:14, 29:15, 29:18, 29:22, 30:3, 30:6, 30:7, 30:13, 30:24 films 14:7 filters 19:19 finally 10:19, 44:16 financially 49:17 fine 29:4, 36:1 fine-grained 37:12 fins 16:10, 16:12, 16:14, 16:20, 16:21, 16:23, 17:1 firmware 42:1, 42:3	first 8:1, 9:6, 16:5, 31:13, 32:22, 33:25, 34:12, 34:19, 38:5, 40:25 five 11:10, 41:18 fixed 39:9 flexibility 38:19, 41:5, 41:8, 42:18, 42:19, 43:3, 43:14 flexible 38:14, 38:15 flexibly 39:12 flip 45:14 focus 19:5 focused 19:2, 19:4 following 48:14 follows 6:10 force 17:6 forces 16:14, 16:21, 16:23 foregoing 47:2 fork 21:5 form 44:11, 45:1, 45:7, 48:7 format 5:6 forms 18:6 forth 8:24, 39:8, 49:5	forward 16:10, 17:14 four 6:23 frame 24:25, 25:11, 26:5, 26:14 frames 11:24 frequency 27:22, 30:19, 39:18, 39:19, 45:5, 45:6, 45:8 friday 1:19, 5:1 front 39:10 function 24:13, 42:4 functionality 36:18 functions 24:14, 41:3, 44:11 further 30:12, 49:9, 49:11, 49:14 future 4:8, 40:9
F			G
fabrication 13:13, 14:9 facility 14:9 fact 44:1 faculty 40:19 fallen 18:17 familiar 21:17, 22:8, 22:15, 22:25,			gabor 40:11 gained 15:7 gave 39:23, 42:21 general 21:21, 21:22, 26:24, 30:7 generally 10:3, 21:10, 22:4, 22:13 give 8:2, 10:10, 12:18, 35:23, 36:2 given 49:8

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

57

giving 29:6 gnc 1:9, 6:4, 23:17, 48:10 go 6:2, 15:3, 35:5, 35:15, 45:25 going 8:7, 16:13, 16:16, 31:5, 31:6, 32:16, 32:17, 33:5, 33:20, 34:11, 34:14, 40:1, 40:2 good 6:13, 6:14, 12:18, 22:17, 30:7, 36:3, 39:1 gosh 8:2, 19:15, 31:1 gotcha 33:19 government 14:11 graduate 12:14, 21:25 great 10:2, 11:2, 14:16, 14:22, 15:9, 15:13, 15:14, 18:25, 23:12, 25:18, 36:5, 42:22, 45:11 greatly 36:18 grey 23:3 guess 12:4, 13:21, 14:4, 18:4, 20:8 guidance 12:15, 12:21, 12:23, 20:6,	20:21 guide 17:13 gyros 21:5 gyroscope 21:19 gyroscopes 21:23, 22:3, 25:7, 25:11, 30:4 H hand 36:16, 49:20 handle 37:6 hanover 2:5 hard 19:19, 27:12, 31:23, 34:7 hardware 42:25 heading 40:24 hear 29:2, 31:24 heard 30:25, 33:6, 33:9, 34:12 heart 19:22 help 5:18 here 7:17, 8:10, 8:23, 9:1, 9:4, 9:19, 11:18, 39:16, 41:10, 44:2, 45:12 hereby 47:4, 49:3 hereinbefore 49:5 hereunto 49:19 high 14:20, 43:16,	43:18, 45:7 high-performance 23:15, 23:19 higher 45:5 highly 37:3 historically 43:20 hoc 13:20 hold 40:14 honestly 27:11 hope 9:13 horizontal 16:11, 17:2 host 17:7 hour 5:2, 35:22 hourly 10:12 hours 7:19, 10:7, 10:11 howe 32:6, 32:8, 33:9, 34:1 howe's 33:11 however 35:24 hughes 15:17, 15:21, 16:6, 17:16, 17:17, 19:5, 24:21, 31:2, 38:4 hulsing 34:12, 34:21 I identification 4:2, 8:9, 31:10, 32:19,	33:23, 34:17, 40:4 identify 5:18, 5:20, 6:1 ieee 16:7 implement 17:9, 17:10 imus 25:4 inaccuracy 41:20 inadequate 36:16 inc 1:6 include 44:12 included 30:2, 30:13 inclusive 47:3 incomplete 31:22, 32:3 incorporating 38:10 increasingly 41:3 index 3:1 inductors 18:13 industrial 14:1 industry 14:4, 14:10, 14:13 inertial 4:7, 11:12, 11:19, 11:21, 11:22, 12:10, 12:15, 15:5, 15:8, 15:19, 15:20, 15:22, 15:25, 16:3, 16:15, 17:10, 17:12, 20:3, 20:6, 20:17,
---	---	---	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

58

20:21, 20:24, 21:4, 24:11, 24:13, 24:16, 24:18, 25:3, 26:20, 26:23, 26:24, 27:3, 27:9, 27:13, 27:22, 30:19, 34:20, 39:15, 39:24 inference 21:14 infinitely 38:15 information 35:14 innovation 13:14 input 17:11, 17:13, 44:13, 44:17, 44:22 inputs 44:9 integrated 4:5, 32:23, 43:17, 43:19, 44:4 integration 43:16, 43:18 interested 49:17 interests 26:15 interface 39:11, 39:12 intermittently 21:2 international 4:4, 31:14 internship 17:18 interrupt 28:5 interruptions 5:24 introduce 8:5, 31:5,	32:16, 33:5, 33:20, 34:11, 34:14, 40:1 introduced 8:19 introduction 40:25 invented 25:1 invention 25:24, 25:25 involve 24:23, 25:2 involved 7:7, 7:9, 20:13, 20:15, 20:16 involving 7:9 ipr 1:12, 1:14, 6:19, 6:24, 7:6, 7:9, 9:2, 9:9, 9:10, 9:12, 9:25, 10:5, 10:17 items 10:14 itself 34:8, 36:16 J jargon 14:4 jet 15:14, 20:12, 20:16 johanningmeier 2:11, 6:3, 6:4, 7:16, 7:18, 7:21, 8:23, 28:25, 29:3, 29:20, 31:20, 31:25, 32:24, 34:5, 34:23, 40:14, 45:24, 46:3, 46:8 journal 16:8	jpl 15:14 K karen 32:23 keep 16:13, 16:16, 16:24, 17:4 kenneth 40:12 key 19:25 kind 8:24, 11:16, 12:2, 12:8, 13:19, 14:24, 15:10, 15:24, 16:3, 17:12, 18:16, 18:22, 19:3, 19:5, 19:10, 19:13, 19:25, 21:7, 21:14, 22:2, 29:16, 38:14, 39:9, 41:25, 42:2, 42:14, 45:5, 45:13 kinds 14:14, 14:21, 18:7, 19:8, 19:21, 20:7 knew 32:6 L lab 14:11, 15:14, 20:13, 20:16 labeled 9:8 labs 15:9, 15:13, 25:10 language 15:3 large 18:20, 38:13	larger 12:24 largest 43:23 larson 1:18, 4:3, 5:5, 6:6, 6:7, 6:13, 32:11, 33:7, 34:3, 34:12, 34:21, 35:5, 35:22, 36:9, 40:11, 40:13, 43:12, 45:21, 47:14, 48:9, 49:4, 49:12 laser 21:5 last 6:24, 7:2, 31:8, 43:25 late 13:14, 20:9, 22:10, 22:16 lauppe 2:4, 6:12, 8:12, 17:15, 20:22, 29:2, 29:5, 29:8, 30:11, 31:11, 32:9, 32:20, 33:4, 33:24, 34:2, 34:10, 34:18, 35:4, 40:5, 40:20, 43:11, 46:14 lauppy 3:3 law 43:24, 43:25, 44:3 lawrence 1:18, 4:3, 5:5, 6:6, 6:7, 47:14, 48:9, 49:4, 49:11 leaders 15:10 least 11:9, 23:20,
---	---	---	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

59

36:4 left 35:24 legal 29:1, 29:20 let's 11:3, 43:13 level 12:15, 42:25 levels 43:16, 43:18 light 19:21 limitless 20:1 line 23:13, 25:19, 48:15 list 21:18 listed 13:6, 40:10, 41:10 literally 14:6 lithography 14:7 litigation 10:20 little 14:8, 26:4, 28:18, 33:3, 34:7, 42:11 llp 2:3, 2:10 long 7:18 look 34:25 looks 34:8, 35:10, 35:13 lot 26:15 lots 19:7 low 27:21, 30:19,	38:13, 45:6 lower 17:2 M maintain 12:2 major 18:22, 20:10, 20:18 majority 44:10 make 12:7, 13:16, 14:8, 14:19, 21:14, 30:23, 35:14, 48:14 making 18:8 manipulation 44:18, 44:23 manufacturing 18:20 many 6:17, 6:22, 10:7, 15:12, 19:6, 36:23, 37:15, 37:18, 43:20, 44:8 march 1:19, 5:2, 48:11, 49:12 marked 8:9, 31:10, 32:19, 33:23, 34:17, 40:4 market 25:21, 26:1, 26:21, 27:4 markings 8:18 markus 32:23 marriage 49:15 martin 40:12, 40:18 mask 42:4	master's 11:9 material 12:17 mathematics 12:6 matter 49:18 mature 23:2, 23:7 maybe 6:23, 7:19, 10:25, 27:14, 37:12, 38:19, 39:10, 42:18 mean 10:23, 11:20, 12:13, 13:7, 13:21, 14:3, 17:23, 18:25, 20:25, 21:1, 22:9, 28:5, 33:14, 38:23, 42:7, 43:17, 44:21, 46:4 means 14:5 meant 12:4, 41:21 measurement 25:3 mechanical 13:10, 13:17 mechanism 21:2, 21:3, 21:11 medical 19:21 meet 7:14, 7:18 meeting 7:20 member 40:19 memorized 10:23 mems 4:5, 4:7,	11:12, 13:6, 13:7, 13:9, 13:10, 13:18, 13:20, 13:21, 13:23, 13:25, 14:15, 14:18, 14:20, 14:24, 21:6, 22:6, 22:18, 22:20, 23:15, 23:19, 24:1, 24:3, 24:4, 24:6, 24:8, 24:10, 24:12, 24:15, 24:17, 24:23, 25:1, 25:2, 25:3, 25:7, 25:10, 25:21, 26:1, 26:3, 26:8, 26:13, 26:21, 26:23, 27:4, 27:9, 27:11, 27:12, 30:4, 32:23, 34:20, 35:11 mention 45:19 mentioned 11:18, 14:12, 18:24, 35:6, 35:16, 37:21, 38:1, 38:2, 41:24 merge 37:9 met 7:16, 7:17 meyer 23:3 microelectromech- anical 13:9 microelectronic 23:5 microelectronics 17:24 microphones 5:16
--	---	--	--

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

60

mid-'s 14:24, 38:5 might 18:20, 26:13, 27:8, 30:1, 30:2, 30:5, 30:13, 31:5, 42:9 miles 2:17 mind 14:14, 15:6, 22:24, 23:4 minutes 36:4 missed 26:24 missile 12:22, 16:2, 16:9, 16:13, 16:16, 16:24, 17:4, 17:7, 17:14, 20:10, 24:20 missiles 15:23 mix 37:21 mixed-signal 36:10, 36:12, 36:13, 37:10, 37:15, 37:17, 37:18, 37:23, 37:24, 38:9 mixing 37:5 modern 43:17, 43:18 modularity 41:5, 42:5, 42:7, 42:14, 43:15 module 42:12 moment 31:6, 40:6 months 7:2	moore's 43:24, 44:3 more 7:3, 16:22, 22:4, 23:1, 23:14, 27:11, 27:14, 35:14, 37:12, 43:21, 44:3, 44:5, 44:6 morning 6:13, 6:14, 45:22 mory 2:10, 6:4 most 45:4 motor 16:9 move 20:20 mri 19:23 much 7:13, 19:2, 24:9, 27:10, 27:11, 35:24, 36:3, 46:11 multiple 11:24, 12:1, 42:12 multiplexer 44:14 mute 5:16 N name 18:25, 19:1, 19:2, 21:20, 22:1 named 30:25 nature 18:1, 18:3, 43:25 navigation 11:12, 11:19, 11:21, 11:22,	12:10, 12:24, 15:5, 15:8, 15:19, 15:20, 15:22, 15:25, 16:3, 16:16, 20:3, 20:6, 20:17, 20:24, 24:11, 24:13, 24:16, 24:18, 26:20, 26:23, 26:24, 27:3, 27:9, 27:13 necessary 17:6, 44:16, 44:22 need 30:23, 37:5, 37:7, 39:9, 45:16, 46:3 needed 17:13, 19:7, 45:13 never 24:17 new 22:18, 31:21, 32:2, 40:15 nintendo 1:5, 1:6, 10:21, 48:10 noise 38:13 non-quantized 18:10 nondiscrete 18:10 note 48:3 notes 8:13 nothing 6:10 novel 13:19 number 9:16, 9:22, 10:10, 10:21, 10:24, 31:15,	33:25 numbered 9:5 numbering 31:8 numbers 42:10 O oath 6:10 obey 37:4 object 31:20, 40:15 objection 28:25, 29:3, 29:20, 32:2 objections 32:24, 34:5, 34:24 obviously 8:20 occurred 49:12 occurring 45:17 off-the-record 5:14 office 1:1 often 22:4 oh 7:1, 8:2, 19:15, 20:5, 31:25, 46:3 okay 10:7, 11:5, 17:19, 23:11, 25:17, 27:18, 29:5, 31:17, 31:18, 32:5, 32:15, 32:16, 33:5, 33:20, 35:5, 36:5, 36:7, 40:7, 45:21, 46:9
--	---	--	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

61

once 8:2, 10:9 one 5:13, 13:5, 16:5, 16:7, 26:5, 32:13, 38:5, 40:6 one) _____ 47:8 ones 37:14, 39:4, 39:13 only 41:14, 44:10 operation 41:25 opinion 11:8, 28:19, 29:1, 29:10 opportunity 29:7, 35:23, 36:2, 36:7 options 28:12, 28:16 orange 26:6 order 16:16, 17:4, 17:13, 21:9, 30:23, 37:6, 37:8, 46:1, 46:7, 46:10 ordinary 11:8, 12:9, 14:14, 15:6, 17:22, 19:11, 20:3, 21:16, 22:7, 22:14, 22:24 other 17:8, 24:14, 29:17, 30:1, 30:9, 30:13, 41:10, 45:12 others 31:15 otherwise 49:18	out 15:14, 21:20, 26:17 outcome 49:18 outer 20:21 output 44:13, 44:18, 44:23 outputs 44:9 outside 37:1, 37:8, 38:21 over 5:13, 7:24, 8:25, 24:7, 37:23, 39:20, 43:14 overall 36:17, 42:16 own 21:7, 26:3 owner 1:10, 2:9 P pacific 5:2, 46:17 page 3:2, 4:2, 9:6, 11:6, 31:13, 32:13, 32:22, 33:25, 34:19, 40:25, 48:15 pages 47:2 palo 2:6 paper 8:10, 8:13, 8:20, 9:18 papers 16:7 paragraph 11:4, 11:6, 11:16, 13:5,	17:19, 23:10, 25:15, 25:19, 27:16, 27:18, 28:7, 30:16, 40:24, 41:2, 44:8, 45:20 parallel 10:25 parkervision 7:8, 7:9 part 10:17, 45:2 particular 10:24, 13:20, 21:21, 25:2, 26:5, 28:11, 28:20, 29:11, 41:20, 44:2 particularly 20:20 parties 49:9, 49:15, 49:16 pasadena 15:14 past 33:3, 35:7 patent 1:1, 1:3, 1:10, 1:13, 1:15, 2:9, 4:6, 9:12, 9:15, 9:16, 9:20, 9:21, 10:15, 20:8, 27:20, 28:1, 28:8, 28:20, 29:11, 29:19, 31:14, 32:10, 33:25, 34:4, 38:3 patents 7:8, 7:9, 10:16, 22:9, 23:17, 23:21, 25:5, 25:9, 26:22, 27:5, 33:15, 37:25 patrick 2:4, 46:10	people 25:13, 27:13 perfect 46:9 perfectly 36:1 perform 24:11, 24:12, 24:13, 24:14 performance 24:9, 37:10 performed 28:2 perhaps 11:25, 35:10, 42:3 period 8:25 person 11:8, 12:9, 14:14, 15:6, 17:22, 19:11, 19:14, 20:3, 21:16, 22:7, 22:24, 31:2, 31:4 personal 22:14 perspective 12:12, 18:18 petitioner 2:2, 6:8 petitioners 1:7 phase 27:14, 27:15 phd 40:18 phone 5:19 phrase 17:21 physical 21:3 pioneered 14:17 pitch 15:24, 16:2
--	---	--	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

62

planes 20:9 please 5:12, 5:13, 5:16, 5:17, 5:20, 11:3, 11:4, 23:10, 25:15, 27:16, 29:7, 46:14, 47:1 plus 41:17 pointed 16:24, 17:5 popular 23:6 position 21:15 post-filter 44:13, 45:10 practical 13:2 practice 12:6 pre 44:13, 45:10 preamplifier 44:12 prebuilt 42:15 precise 7:3, 10:10, 35:14, 38:12 preparation 7:14, 7:22 prepare 7:10, 7:17 prepared 5:7 present 2:16, 10:3, 10:8 pressure 19:22 pretty 7:13, 12:1, 19:2, 22:2, 23:2 prevent 45:16	previously 41:8, 42:17 print 48:3, 48:5 prior 23:16 priority 23:16, 23:21, 25:5, 25:8, 26:21, 27:4, 33:15, 37:25, 38:3 probably 8:11, 12:14, 18:19 problems 30:10 proceeding 5:11, 5:14, 6:19, 6:24, 7:6, 8:7, 10:21, 10:25 proceedings 9:2, 9:4, 10:4, 10:8, 10:18, 35:8, 35:19 process 14:6, 45:2 processing 4:9, 11:12, 13:7, 13:8, 13:12, 13:18, 13:22, 14:1, 14:3, 14:15, 14:18, 22:6, 22:20, 30:18, 38:20, 38:24, 40:10, 41:3 processor 27:21, 43:23 processors 44:9 production 27:15 products 25:20, 26:1, 26:8, 26:16, 26:20, 27:3	professional 13:3, 23:14 professor 33:11, 40:17, 40:18 program 38:15 programmability 41:5, 41:22, 42:2, 43:4, 43:15 programming 38:17 prone 30:4 propulsion 15:14, 20:13, 20:16 prospects 4:8, 40:9 protocol 37:3, 37:7, 39:5, 39:6, 39:14 protocols 42:22, 42:23 provide 5:21 provider 20:19 provides 29:13 published 16:7 purchase 5:22 purposes 5:14, 13:13, 36:16 pushing 16:9 put 8:7, 24:24, 36:17, 43:21, 44:5 putting 44:3	quantized 18:2, 41:15 question 22:17, 26:25, 29:1, 29:4, 29:7, 34:3, 34:21, 35:7, 35:17 questions 40:16, 45:22, 45:24 quick 42:15 quickly 28:23 quite 14:23, 20:15, 22:18, 26:3, 29:2, 37:23
			R
			radiofrequency 24:5 raise 17:1 rand 34:12, 34:20 range 19:24, 38:13 rate 10:12, 19:22, 28:14, 30:21, 34:20 rather 17:3, 27:15 raytheon 15:17 re-reviewed 7:11 read 47:1 reading 35:12 reads 41:2 real 2:12 really 13:11, 14:3
		Q	
		quantities 18:15	

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

63

recall 35:7, 35:18 receive 17:24, 27:21, 29:24, 38:21 received 17:11, 39:3 recognize 40:12, 40:17 record 6:2, 9:24, 29:4, 31:13, 31:21, 46:1, 49:7 recording 5:13, 5:22 records 7:4, 8:3, 10:9 reduce 21:10 redwood 2:13 reexamining 7:4 refer 9:9, 9:15, 9:20, 9:24, 10:3, 10:15, 10:19, 13:25 reference 11:25 referring 8:11, 9:16, 9:21, 9:25, 10:4, 10:20, 22:13, 25:23, 28:16, 31:4, 33:16, 44:1 refers 14:1 regulations 5:7 related 16:2, 21:2, 49:14 relatively 44:11 relevant 11:10, 13:1,	15:7 remaining 44:11 remember 5:12, 5:16, 7:1, 21:20, 22:1 remembered 5:1 remote 1:17, 2:1, 49:10 remotely 5:3, 5:5, 5:11, 49:12 removed 45:8 repeat 26:25, 27:1, 29:7, 31:24 reporter 1:24, 5:4, 5:18, 5:25, 16:18, 20:14, 31:23, 32:4, 43:7, 43:10, 45:25, 46:5, 46:9, 49:1, 49:2, 49:24 reporter's 3:6 represented 49:9 reproduced 28:6 require 12:1, 12:20, 28:11, 28:12, 28:20, 29:11 required 14:8, 17:4, 29:15, 29:16 requirements 30:15, 39:17, 42:24 requires 27:20 research 27:14	resistors 18:13 response 42:24 rest 35:25 result 43:24, 44:8 resulting 37:10 reused 42:11 review 7:20, 8:20, 28:23 reviewed 7:23, 35:1 reviewing 8:3, 13:5 rf 24:1, 24:3, 24:4, 24:5, 24:10, 24:12, 26:3, 26:8, 26:12, 27:11, 27:12 right 7:16, 10:1, 16:17, 17:5, 46:6, 46:8 right-hand 9:5 ring 21:4 robustness 12:3 roger 32:6, 32:7, 33:9, 34:1 roll 15:24 rotating 11:24 rotation 11:25, 21:11, 21:12, 21:13 rotational 19:18	roughly 6:18, 8:4 rpr 1:24 rule 4:7 run 5:11 S s 13:14, 13:15, 14:24, 20:9, 22:10, 22:16, 33:18 said 5:3, 5:6, 7:22, 16:19, 20:14, 27:6, 27:7, 30:18, 30:20, 33:9, 43:7 same 18:9, 26:11, 31:2, 31:4, 32:24, 34:5, 34:21, 34:23 sampled 26:11 sampling 26:7, 26:9, 26:13, 26:16 satellite 38:6 satellites 20:10 satisfy 29:18, 30:14 say 6:18, 8:4, 10:10, 11:7, 20:5, 20:18, 23:14, 25:20, 26:7, 27:20, 27:25, 28:10, 28:25, 30:1, 34:7, 34:8, 35:16, 39:10, 44:8
--	--	--	--

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

64

saying 30:8, 43:13 says 30:17 science 18:5 second 21:8, 23:13, 25:19, 28:22 section 5:8, 21:22 sedra 23:5 see 11:7, 11:14, 23:13, 23:17, 25:19, 25:21, 25:22, 27:19, 27:23, 27:25, 28:3, 28:6, 28:10, 28:14, 28:17, 32:6, 40:24, 41:2, 41:6, 43:12, 43:14, 44:7, 44:8, 44:19 seen 32:10, 32:15, 33:2, 34:4, 34:9, 34:22, 35:2, 35:3, 35:6, 35:16 semiconductor 11:12, 13:6, 13:7, 13:12, 13:15, 13:18, 13:21, 13:23, 13:25, 14:9, 14:15, 18:19, 22:6, 22:20, 24:7 senior 12:14 sense 21:13, 41:13 sensing 18:7, 19:8, 21:11, 21:12	sensor 17:25, 28:14, 30:21, 34:20 sensors 14:20, 18:6, 19:18, 19:20, 19:21, 19:22, 19:23 sentence 17:21, 43:13, 45:11 seshia 33:7, 34:1 set 30:22, 41:15, 49:5, 49:19 several 12:12, 23:2, 43:22, 43:25 shorthand 5:4, 49:1, 49:2, 49:24 should 5:15 shown 30:24 shows 28:1 side 45:14 sign 48:7 signal 4:9, 27:21, 29:24, 30:18, 38:20, 38:23, 40:9, 41:2, 44:9, 44:17, 44:18, 44:22, 44:23, 44:25, 45:2, 45:13, 45:15, 45:18 signals 17:25, 18:5, 24:6, 27:22, 28:3, 28:12, 28:14, 30:19, 30:20, 37:13,	38:21, 45:5, 45:6, 45:8 signature-mig2k 49:21 simple 42:3, 42:9 since 6:1, 31:21 six 6:18, 7:2, 7:19 skill 11:8, 12:9, 14:15, 15:6, 17:22, 19:11, 20:4, 21:16, 22:7, 22:14, 22:25 slightly 32:7 slowly 16:22 smith 23:5 smoothly 5:12 software 38:16, 42:1, 42:3, 43:4 solid-state 16:8 some 7:7, 7:8, 12:13, 13:19, 21:11, 21:14, 21:19, 24:19, 25:1, 26:12, 26:13 someone 30:25 something 16:6, 43:24, 45:4 sometimes 45:18 sophisticated 12:1, 37:2, 38:9, 39:5, 39:13, 39:17,	39:21 sophistication 38:20, 38:23 sorry 7:1, 7:3, 10:14, 16:18, 16:22, 20:14, 26:23, 26:24, 28:5, 29:2, 29:3, 29:14, 31:6, 31:23, 31:25, 33:12, 34:23, 35:2, 43:3, 43:7, 43:9 sort 26:14, 35:12 sorts 14:13 space 17:13, 20:11, 20:12, 20:20, 20:21 speaking 5:18, 5:20, 16:19 specific 21:19, 22:3 specify 48:6 st 2:5 stages 44:14 stamp 24:24 standard 5:2, 46:17 standards 39:7 standing 46:10 stands 13:9 stanford 33:12 start 43:13 start-ups 14:23, 14:25,
--	---	--	--

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

65

26:4 starting 11:6, 23:13, 27:19 state 5:4, 6:9, 47:4, 49:3, 49:25 state-of-the-art 40:9 statement 30:7 states 1:1 stay 31:7 stenographer 49:1 stenographic 1:24, 5:25, 16:18, 20:14, 31:23, 32:4, 43:7, 43:10, 45:25, 46:5, 46:9, 49:2, 49:24 steps 14:6, 14:8, 30:13, 41:15 still 21:2, 27:14 straight 16:13 struggling 27:14 student 21:25 subject 41:19 substituting 11:14 sufficient 36:21 sugar 19:23 suite 13:22, 15:11 summer 17:18	sure 6:3, 20:25, 22:19, 22:21, 28:24, 34:9, 35:16 switches 24:5 switching 24:8, 41:3 sworn 6:9, 49:5 system 12:5, 16:16, 16:25, 17:3, 17:8, 17:11, 17:12, 18:21, 19:7, 20:19, 21:8, 21:22, 24:3, 24:4, 24:5, 24:20, 24:23, 27:12, 30:18, 30:23, 36:10, 36:12, 36:13, 36:14, 37:5, 37:7, 37:10, 37:15, 38:6, 38:7, 38:9, 38:11, 39:9, 39:16, 39:24, 41:17, 42:16, 42:25 systems 11:11, 11:19, 11:20, 11:22, 11:23, 12:10, 12:21, 12:22, 12:24, 12:25, 13:10, 13:20, 15:4, 15:8, 15:23, 15:25, 16:3, 18:21, 19:7, 19:10, 19:13, 19:14, 19:19, 19:24, 20:2, 20:7, 20:11, 20:17, 20:23, 21:1, 22:5, 24:1,	27:9, 27:10, 27:12, 36:24, 36:25, 37:17, 37:18, 37:20, 37:23, 37:24, 38:2, 38:12, 38:14, 38:19, 39:2, 39:16, 39:23, 39:25, 41:6, 41:9, 41:11, 41:12, 41:13, 41:19, 41:23, 41:25, 42:6, 42:9, 42:20, 43:2, 43:15, 44:2 T tag 2:17 take 12:17, 28:22, 31:6, 35:23, 37:13, 39:2, 39:9, 39:11, 39:12, 44:2 taken 12:13, 49:7 taking 18:5, 21:13 talk 5:12, 8:11, 16:22, 45:10, 45:12 talked 43:3 talking 15:4, 17:20, 20:8, 24:19, 39:16 technical-related 5:24 technician 2:17, 5:10, 46:12 techniques 13:12, 13:16, 13:19, 13:20,	13:22, 38:17, 41:4 technology 25:21, 26:2, 26:8, 26:21, 27:4 tell 17:12 temes 40:11, 40:18 temperature 19:21, 39:20 ten 23:14, 23:20 terrestrial 12:25 testified 6:10 testify 9:1, 9:5 testimony 7:23, 48:3, 48:5, 49:7 textbook 21:22, 21:25, 23:5 textbooks 21:16, 21:18, 21:19, 22:3, 22:5, 22:7, 22:19, 22:24, 23:3, 23:7 th 5:1, 49:12 thank 5:10, 5:24, 10:6, 28:9, 29:6, 32:4, 36:3, 36:7, 40:23, 43:10, 45:21, 45:23, 46:11 themselves 6:1, 45:7 theory 12:6 thing 39:22
---	--	---	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

66

things 13:6, 16:5, 17:8, 18:7, 19:8, 20:20, 26:17, 29:23, 30:1, 30:8, 30:23, 41:10, 43:2, 44:6 think 9:20, 10:23, 12:18, 20:11, 21:2, 22:3, 22:17, 22:22, 29:13, 31:3, 32:12, 33:18, 35:1, 36:3, 36:5, 36:21, 39:1, 41:20, 42:1, 42:7, 42:22, 45:4, 45:18, 46:4 three 6:23, 41:17 threshold 10:14 through 24:25, 35:25, 47:2 time 5:3, 5:20, 15:18, 18:10, 20:7, 22:9, 22:19, 22:21, 23:1, 24:24, 24:25, 25:11, 25:23, 25:25, 26:2, 26:5, 26:12, 26:14, 27:15, 33:13, 33:14, 33:16, 33:17, 35:12, 39:6, 39:14, 39:20, 42:24, 46:17 times 6:17, 6:22 title 35:13, 48:10	titled 32:22, 34:19, 40:8 today 6:2, 7:23, 10:5 today's 7:10, 7:15 together 7:25, 36:15, 36:17, 37:9, 38:8 tools 13:22 top 9:5, 27:19 total 10:11 trademark 1:1 traditional 13:12, 13:15, 13:18, 24:7 transcript 5:6, 5:23, 46:2 transistors 13:16, 18:12, 43:21, 44:3, 44:5 transmission 44:19, 44:24 transmit 39:8 trial 1:3 true 49:7 truth 6:9, 6:10 try 16:22 trying 21:9, 22:17 tuning 21:5 turn 11:3, 11:4, 17:19, 23:10, 25:15, 27:16,	39:4, 39:12 turning 13:4, 23:9 tutorial 4:9, 40:10 tv 38:6 two 6:23, 9:2, 16:7, 18:22, 37:9, 39:23, 41:17, 42:10 type 12:24 types 20:23, 20:25, 21:1, 29:17 typically 17:24, 18:22, 36:15 U ucla 40:18 unable 5:19 unclear 25:14, 33:3 under 40:24, 42:1 undergraduate 21:24 understand 9:1, 9:3, 9:10, 9:16, 9:21, 9:23, 9:25, 10:1, 10:4, 10:6, 10:16, 10:20, 10:24, 22:14 understood 29:5 unedited 5:21 unique 21:7 unit 30:21	united 1:1 units 25:4 until 17:17 uploaded 32:21 use 11:24, 13:11, 13:12, 13:18, 13:19, 19:24, 35:20, 36:25, 38:16, 38:18, 41:4, 42:15 useful 39:22 uses 18:12 using 13:15, 18:7, 21:3, 21:4, 21:13, 24:6, 25:21, 26:1, 26:8, 26:21, 27:4, 27:9 usually 44:12 utterance 16:15, 20:13, 31:21, 43:5 V variety 14:19, 14:25, 15:19, 29:23, 29:25, 38:16, 42:9, 42:13, 42:24, 45:3, 45:16 various 7:12, 7:24, 8:25, 12:21, 15:16, 21:8, 26:11, 28:1, 30:3, 39:18, 45:12 velocity 17:7, 21:14
---	---	---	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

67

versa 11:14 versions 8:25 vertical 16:12, 17:2 via 5:19 vibration 12:3 vice 11:14 video 5:17, 5:19 videographer 6:1 view 30:12 virtue 43:2 volume 14:20 W wait 40:14 want 16:13, 31:7, 32:12, 35:23, 35:24, 42:25, 46:1, 46:12, 48:4, 48:6 wanted 36:1, 41:9 washington 10:22 way 10:25, 39:8, 39:10, 41:10, 41:11, 49:17 ways 12:12, 25:1, 45:3 we're 20:8, 26:14, 35:22, 39:16, 43:22, 44:1 we've 43:20	weeks 8:25 well-known 22:2, 23:7 went 7:24, 8:24 weren't 15:25, 16:3 western 10:22 whereof 49:19 whereupon 8:8, 31:9, 32:18, 33:22, 34:16, 40:3, 46:15 whether 34:9, 35:16 whole 6:9, 12:5, 15:11, 17:7, 30:22, 38:7 wi-fi 19:20 widespread 42:14 william 30:25, 31:3, 31:14, 32:5 wispy 26:6 within 7:2, 15:16, 30:22, 49:3 without 7:3, 8:3, 10:9 witness 5:6, 6:5, 6:6, 6:8, 8:10, 16:21, 20:16, 29:6, 29:22, 32:5, 33:1, 34:7, 34:25, 40:17, 43:9, 49:4, 49:8, 49:19 witness's 3:5, 48:1	wo 31:15 words 48:4, 48:6 work 12:7, 12:23, 15:20, 15:22, 15:23, 17:16, 18:16, 18:18, 30:24, 31:1, 37:22, 37:24 work-related 18:22 worked 8:23, 10:7, 14:24, 15:18, 16:5, 17:8, 17:17, 18:19, 18:20, 19:11, 19:14, 24:20, 37:17, 37:18, 37:19, 37:20, 37:23, 38:2 working 12:19, 15:12, 20:4, 25:10, 25:13, 26:12, 27:7 world 15:10, 17:25, 18:5, 37:1, 37:8, 38:22 wouldn't 36:21 Y yan 1:24, 5:3, 49:2 yaw 15:24, 16:2 yeah 8:15, 10:9, 11:22, 16:5, 21:18, 22:12, 22:16, 24:12, 24:17, 27:1, 27:2, 31:12, 31:17, 32:5,	37:22 year 8:4 years 11:10, 19:6, 23:8, 23:14, 23:20, 37:23 yesterday 7:19, 7:25 yourself 5:20 Z zeros 37:14, 39:4, 39:13 \$ \$600 10:13 0 00 9:25 00302 10:21 00667 9:9 00668 1:14, 9:8, 9:25 0067 1:12 1 1040 4:4, 31:7, 31:9, 31:12, 31:13, 33:18 1041 4:5, 32:17, 32:18, 32:21, 35:6 1042 4:6, 33:21, 33:22, 33:25, 35:15, 35:18 1043 4:7, 34:15,
--	---	---	---

Transcript of Dr. Lawrence Larson
Conducted on March 28, 2025

68

34:16 1044 4:8, 40:2, 40:3, 40:8, 40:12, 40:21 1130 2:6 122 9:12, 9:15, 10:15, 23:21, 27:20, 28:8, 28:19, 28:23, 29:10, 29:19 13 46:16, 49:13 14316 1:24 1970 17:18 1980 17:17, 24:25 1983 24:25 1988 40:8 1990 14:18 1996 17:17, 33:18 1999 26:7 2 2000 20:9, 22:10, 22:16, 26:7 2019 4:3, 8:6, 8:8, 8:19, 8:22, 11:4, 11:7, 13:5, 17:20, 23:10, 25:16, 27:17 2024 1:12, 1:14, 9:9, 9:25 2025 1:19, 5:2,	48:11, 49:12, 49:20 21 11:6 223 10:21 2473 5:8 28 1:19, 5:1, 48:11, 49:12 2nd 49:20 3 30 36:4 31 4:4 3175 2:5 32 4:5 33 4:6 34 4:7 351 2:14 4 40 4:8, 10:10 45699 31:15 47 3:5, 27:16, 27:18, 28:7, 30:16 49 3:6, 47:3 5 5 1:20, 5:2, 49:13 50 11:16	5000 2:7 57 11:4, 11:6, 11:17, 13:5, 17:19 58 1:20, 5:2, 49:13 59 23:10 6 6,250,156 4:6, 34:1 6,508,122 1:13, 9:17 6,671,648 1:15, 9:22 60 10:11 648 9:13, 9:20, 10:15, 23:21 650 2:7, 2:14 667 9:8, 9:9, 9:12, 10:4 668 9:13, 9:25, 10:5 7 7 46:16, 49:13 701 2:12 7248 2:14 8 80 13:14 82 25:15, 25:19 843 2:7	9 90 13:15, 14:24, 20:9, 22:10, 22:16, 38:5 94063 2:13 94304 2:6 97 31:15
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