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Transcript of James F. Shanley, Ph.D.

Date: November 6, 2024

Case: Hesai Technology Co., Ltd. -v- Ouster, Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

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Conducted on November 6, 2024

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5 LTD, : U.S. Patent 11,178,381	5
6 Petitioner, :	6 E X H I B I T S
7 v. : IPR No. 2023-01457	7 (All previously marked except 2019, which is
8 OUSTER, INC., : U.S. Patent 11,190,750	8 attached hereto.)
9 Patent Owner. :	9 DEPOSITION EXHIBITS PAGE
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3 FISH & RICHARDSON P.C.	3 Exhibit 2019 Janet transcript in '381 and 22
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5 1 November 6, 2024 9:22 a.m. 2 P R O C E E D I N G S 3 JAMES F. SHANLEY, PH.D., 4 being first duly sworn or affirmed to testify to the 5 truth, the whole truth, and nothing but the truth, was 6 examined and testified as follows: 7 EXAMINATION 8 BY MR. LAUPPE: 9 Q. Good morning, Dr. Shanley. 10 A. Good morning. 11 Q. So if I refer to the '381 patent IPR, do you 12 understand that refers to IPR2023-01456? 13 A. Yes. 14 Q. And if I refer to the '750 patent IPR, do you 15 understand that refers to IPR2023-01457? 16 A. Yes little. 17 Q. And if I refer to the '405 patent IPR, do you 18 understand that refers to IPR2023-01421? 19 A. Yes. 20 Q. And for each of these proceedings, if I refer 21 to your opening declaration, do you understand that 22 refers to the declaration, you submitted with the	7 1 Q. Understood. So if I refer to a page number 2 in your '381 reply declaration today, you understand 3 I'm referring to the upper set of page numbers? 4 A. Oh, the upper. Okay. 5 Q. So if you turn to Page 42 of Exhibit 1040 in 6 the '381 IPR, do you see Paragraph 73? 7 A. Yes. 8 Q. And do you see in -- at the end of Paragraph 9 73 you say, "The record lacks any indication that 10 Dr. Janet's declarant has sufficient LiDAR experience, 11 much less two to three years of experience"? Do you 12 see that? 13 A. Yes. 14 Q. So Dr. Janet is patent owner's expert in the 15 '381 patent IPR; is that correct? 16 A. I believe so. 17 Q. So let's turn to -- strike that. You 18 reviewed Dr. Janet's declaration in support of the 19 patent owner response in the '381 patent IPR 20 proceeding; correct? 21 A. Yes. 22 Q. Let's turn to Dr. Janet's declaration in the
6 1 petition in each of those proceedings? 2 A. Yes. 3 Q. And for each of those proceedings, if I refer 4 to your reply declaration, do you understand that 5 refers to the declaration you submitted with the 6 petitioner reply in those proceedings? 7 A. Yes. 8 Q. So in the present depo do you understand that 9 we're discussing the '381 patent IPR and the '750 10 patent IPR? 11 A. Yes. 12 Q. So I'm going to introduce as an exhibit your 13 reply declaration in the '381 patent IPR. So that's 14 Exhibit 1040 in the IPR ending in 1456. 15 (Exhibit 1040 previously marked for 16 identification.) 17 Q. Do you recognize this Exhibit 1040, 18 Dr. Shanley? 19 A. Yes. 20 Q. And in Exhibit 1040 please turn to Paragraph 21 73, which is on Page 42 of Exhibit 1040. 22 A. On Page 40? There's different pages on here.	8 1 '381 patent IPR. So that's Exhibit 2009 in the '381 2 patent IPR. 3 (Exhibit 2009 previously marked for 4 identification.) 5 Q. So can you turn to Exhibit A, which is 6 Page -- well, it's PDF Page 138 of Dr. Janet's 7 declaration. 8 A. 148? 9 Q. So it's toward the end. It's hard to 10 communicate in a paper version. But if you find Page 11 131 of the declaration, which is -- the page after 12 that. 13 A. I'm on 141. 14 Q. Sorry, can you turn to Page 138 of the -- 15 Page 138 of the -- 16 A. 148? 17 Q. 138. 18 A. Oh, 138. 19 Q. So if you turn to the next page, do you see 20 that Exhibit A is Dr. Janet's CV? 21 A. Yes. 22 Q. So please turn to Page 2 of Dr. Janet's CV.

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9 1 A. Okay. 2 Q. Do you see -- sorry, I just want to put one 3 more piece of paper in front of you. 4 MR. LAUPPE: I'm going to introduce -- 5 this is Exhibit 1003 in the '381 patent IPR. This is 6 Dr. Shanley's opening declaration. 7 (Exhibit 1003 previously marked for 8 identification.) 9 Q. And Dr. Shanley, can you turn to Page 38 of 10 Exhibit 1003. And again, this is the upper page 11 numbers. 12 A. Okay. 13 Q. Do you see Paragraph 72 on Page 38? 14 A. Oh, 38. 15 Okay. 16 Q. So do you see Paragraph 72? 17 A. Yes. 18 Q. Do you see at the top of Paragraph 72 you 19 say, "In my opinion, based upon my knowledge and 20 experience in this area, a POSITA as of September 24, 21 2015 would have had an undergraduate degree in 22 mechanical or electrical engineering or physics and	11 1 A. Yes. 2 Q. So if you look at the top of the page, do you 3 see the bullet point starting with "ONR/USMC Cargo 4 UGV"? 5 A. Please repeat that. 6 Q. Sure. Do you see the bullet point at the top 7 of Page 2 that reads "ONR/USMC Cargo UGV"? 8 A. Yes. 9 Q. And do you see, reading further on that line, 10 "PM for ONR/USMC-sponsored Cargo Unmanned Ground 11 Vehicle (CUGV) Program subcontract (2011 to 2012)"? 12 A. Yes. 13 Q. And do you see, reading further, "Manage team 14 of engineers and scientists, in coordination with 15 contract prime (Oshkosh) for unmanned combat vehicle 16 control, perception and navigation"? Do you see that? 17 A. I see that. 18 Q. Finally, finishing this up, do you see that 19 it reads, "Multi-sensor suite included EO/IR Vision, 20 LiDAR, IMU, and GPS"? Do you see that? 21 A. I see that. 22 Q. And then do you see at the top of that same
10 1 two to three years of experience in the field of LiDAR 2 design"? Do you see that? 3 A. Yes. 4 Q. So in your opinion, the definition requires 5 two to three years of experience in the field of LiDAR 6 design; is that correct? 7 A. Correct. 8 Q. So now, if we can just turn back to Exhibit 9 2009; so we were looking at Dr. Shanley's CV. Do you 10 see -- 11 A. Which should we go to? 12 Q. Sorry, I know it's a lot of paper. 13 A. Go back to the original, Page 2? 14 Q. Right. So we were on Page 2 of Exhibit 15 2009 -- sorry, Page 2 of Dr. Shanley's CV. Do you see 16 at the top of Page 2 of Dr. Shanley's CV in Exhibit 17 2009, do you see where it says "ONR/USMC Cargo UGV" -- 18 A. You're talking about Janet's CV? 19 Q. Correct. Did I say Shanley? Sorry. 20 Dr. Janet's CV. 21 Let's start over. We're looking at Page 2 22 of Dr. Janet's CV in Exhibit 2009. Correct?	12 1 page, Page 2, just below that bullet point, do you see 2 where it says "Army LTL"? Do you see that? 3 A. I see that. 4 Q. And do you see, reading further on, "PM for 5 Army-sponsored Lighten-the-Load (LTL) Program 6 subcontract (2012 to 2013)"? Do you see that? 7 A. Yes. 8 Q. And then reading further, "Manage team to 9 develop perception system comprised of stereo LWIR 10 cameras to find and track leader(s), perform optical 11 odometry, detect and map obstacles, and enhance 12 SIGINT"? Do you see that? 13 A. I see that. 14 Q. And then finishing that up, do you see that 15 it reads, "Interface with sensors (LiDAR, IMU GPS), 16 autonomy for ATV-sized unmanned ground vehicles"? Do 17 you see that? 18 A. I see that. 19 Q. So between those two projects, do you see 20 that Dr. Shanley was working on those two projects in 21 2011 -- 22 A. Dr. Janet?

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13 1 Q. Yes. I'm sorry, Dr. Shanley. I do this a 2 lot. 3 A. Okay. 4 Q. But please keep reminding me. I'm sorry for 5 confusing that. 6 So Dr. Shanley, so between those two 7 projects do you see that Dr. Janet worked from 2011 to 8 2013 on those two projects? Do you see that? 9 MR. DEUTSCH: Objection, scope. 10 A. I see that. 11 Q. And both of those projects involved LiDAR; 12 correct? 13 MR. DEUTSCH: Objection, scope. 14 A. That's what his resume says. 15 Q. So it's your opinion in this proceeding that 16 Dr. Janet does not have sufficient LiDAR experience on 17 this record; is that correct? 18 MR. DEUTSCH: Objection, scope. 19 A. My opinion is that he's very light in 20 experience in these areas. And if you look at what 21 this says, he's managing a team, and basically there 22 are several different units here. There's the EOIR	15 1 assuming that Dr. Janet's LiDAR experience wasn't for 2 the full year? 3 A. No, I didn't say that. I said I don't know, 4 because he just lists time, he doesn't list months. 5 And similarly with the other one that we talked about, 6 the LTL, similar experience. 7 And also the fact that he has other 8 subcontract -- or subsystems, plus he's also doing 9 subcontract work and he's going back and forth 10 subcontractwise. So he's looking at financials as 11 well as technical. So the question is how much 12 technical input does he have in each of these systems. 13 So does he put his time into the IMU, the GPS? Which 14 system does he work on? And similarly, for the other 15 one. 16 So it doesn't speak to me of a lot of 17 experience in LiDAR. 18 Q. And then again for Army LTL, so you're 19 assuming that Dr. Janet's LiDAR experience didn't last 20 the full year between 2012 and 2013? 21 A. No, I'm not assuming that. I question that. 22 I don't know the exact time that he put in on it. So
14 1 vision, there's the LiDAR, there's the IMU, there's 2 the GPS. Multi-sensor suite: Tells it all. That's 3 under the Cargo UGV. 4 In the Army LTL he's managing the team. 5 These programs subcontract. It's a year of 6 experience. And that is so light. If this resume 7 came across my desk to hire a person for LiDAR and to 8 manage a LiDAR program, I wouldn't hire them. That's 9 very light experience. And the fact that he's under 10 the Cargo UGV, he has multisensor suites, means he's 11 managing many different things. And with a year of 12 experience, how can you get in-depth knowledge and 13 understand the intricacies of any of these systems to 14 actually do a complete design? And he's also handling 15 contractual issues. 16 So the question is, in one year, how much 17 time can you spend doing that? And similarly, one 18 year -- he looks like he's overlapping with his Army 19 LTL experience in that year. So basically that says 20 he's -- you know, is it the full year? Is it the half 21 year? Is it -- why is his involvement so brief? 22 Q. So for this ONR USMC UGV IMR, are you	16 1 it's ambiguous from his resume. 2 And the other thing that's ambiguous is 3 how much time he did spend on LiDAR as opposed to 4 doing subcontract work as opposed to looking at 5 financials as opposed to doing all the report writing 6 to the -- and coordinating with the various people 7 working on the team for their inputs to do the monthly 8 and -- reporting on this, how he's reporting the 9 financials, how he's managing the resources in each of 10 these areas. 11 So the question is how much time is he 12 working on admin. stuff as well as the technical part. 13 And then you're divided into so many different -- into 14 these four different systems. How much time is he 15 spending on each? So does he really have that full 16 year's experience on LiDAR? And it doesn't speak to 17 me that he has an in-depth knowledge of LiDAR that we 18 in our declaration basically said he has to have. 19 Q. So let's turn back to your opening 20 declaration in the '381 IPR. This is Exhibit 1003. 21 So we were looking at Paragraph 72. Correct? 22 A. Yes.

17 1 Q. So just again, do you see at the top of 2 Paragraph 72 you say, "In my opinion, based upon my 3 knowledge and experience in this area, a POSITA as of 4 September 24, 2015 would have had an undergraduate 5 degree in mechanical or electrical engineering or 6 physics and two to three years of experience in the 7 field of LiDAR design"? Do you see that this? 8 A. I see that. 9 Q. So are the three years in which Dr. Janet 10 worked on these two projects we've just been 11 discussing in his CV, do those not constitute two to 12 three years of experience in the field of LiDAR 13 design? 14 A. In my estimation -- 15 MR. DEUTSCH: Objection, scope. Go ahead. 16 A. In my estimation, and not seeing his full 17 resume and the amount of time he spent on the LiDAR 18 system and questions on the LiDAR systems and reading 19 his document and CD (sic) here, he doesn't have the 20 requisite experience of two years. 21 Q. But that's based on you assuming he didn't 22 work on LiDAR for the entirety of the span of years	19 1 subcontract," and it says "manage team to develop 2 perception system comprised of stereo EO and stereo 3 LWIR cameras to find and track leaders, perform 4 optical odometry, detect and map obstacles, and 5 enhance SIGINT" -- that's "signal intelligence" -- 6 "interface" -- "interface," what does that mean? -- 7 "with sensors (LiDAR, IMU GPS), autonomy for ATV-sized 8 ground vehicles." 9 So "interface," I don't know what that 10 means. It's to make play between each of these 11 sensors. Does it say that I need to go in and 12 understand the dynamics of my LiDAR system and design 13 it? No, it says I have to interface it, all I have to 14 know, about input and output. 15 So that doesn't tell me he has a lot of 16 experience with LiDAR, just the interface between 17 LiDARs, and that's not the experience and requisite 18 you would need to design this system. 19 Also, he's managing a team to develop the 20 perception system. So how much of his input is into 21 the LiDAR system or does he understand it? And then 22 again, his team is there, so does he have a LiDAR
18 1 shown in his CV; correct? 2 MR. DEUTSCH: Objection, mischaracterizes. 3 A. It's not obvious from his CD how many years 4 he has in this area, and one cannot discern from this. 5 If I do the analysis of his CD, it says to 6 me that he does not possess the requisite experience 7 in LiDAR that we require in our document. 8 Q. So are these two projects we've discussing in 9 Dr. Janet's CV, are those in the field of LiDAR 10 design? 11 MR. DEUTSCH: Objection, scope. 12 A. It's not only in the field of LiDAR design, 13 but it's in stereo LWIR cameras, stereo EO. It also 14 has IMUs, GPSs, autonomy. It's phased with sensors. 15 Let's read this. "Manage team" -- "manage 16 team" -- "to develop perception system comprised of 17 stereo EO and stereo LWIR cameras to find and track." 18 Okay? And he has -- okay, "so cameras to find and 19 track LiDAR, IMU, GPS." You know -- I'm sorry -- let 20 me go back. 21 "Manage lead" -- it's crinkled. 22 The key word here for me is "program	20 1 expert on his team? 2 So it says to me, if I were going to hire 3 him in my group to do LiDAR, he doesn't have that 4 requisite experience. I would hire -- let me just 5 say, reading this paragraph, he doesn't have the 6 requisite experience from that paragraph. 7 Q. And so you've been discussing this language 8 "manage team of engineers and scientists." Correct? 9 A. Correct. 10 MR. DEUTSCH: Objection, mischaracterizes. 11 Q. So is it not legitimately -- strike that. 12 So does a POSITA -- strike that. 13 So does a person not have a legitimate two 14 to three years of experience in the field of LiDAR 15 design for your POSITA definition if they worked on a 16 team of engineers and scientists? 17 MR. DEUTSCH: Objection, scope. 18 A. From my experience, he does not have the 19 experience that we propose in my declaration. 20 Q. Part of your basis for that, though, as you 21 were discussing, was the fact that he worked on a 22 team; is that correct?

21 1 MR. DEUTSCH: Objection, mischaracterizes. 2 A. My objection to him -- his experience is 3 that, with his duties of managing the team, he would 4 not have the experience to sit down and design a LiDAR 5 system. 6 Q. And that's based on these two bullet points 7 on his CV; is that correct? 8 A. Not only that, but looking through -- that's 9 one of the indicators. And there are -- 10 I would say yes. 11 Q. You said that's one of the indicators. What 12 are the other indicators? 13 A. His resume is very weak in LiDAR experience, 14 in optical experience. 15 Q. Did you review the transcript of the 16 deposition of Dr. Janet in the '405 patent IPR? 17 A. I reviewed it. 18 Q. Okay, let's take a look at that transcript 19 now. 20 MR. LAUPPE: So I'm introducing Exhibit 21 1034 in the '405 patent IPR. 22 (Exhibit 1034 previously marked for	23 1 Q. Correct. Do you see on each of these pages 2 you have kind of four different transcript pages? 3 A. Yes. 4 Q. You see the little numbers up on the 5 right-hand corner of those little boxes. If you can 6 turn to Page 27. So that's actually on Page 8 of the 7 exhibit. 8 A. Page 8 of the exhibit. It says 29 to 32, 9 that box? 10 Q. So actually it's the page before. This is 11 actually Page 7. There's a lot of page numbers here. 12 Do you see at the top right corner 7 (25 to 28)? 13 A. Yeah, 7 (25 to 28). 14 Q. And then do you see, starting at Line 17 of 15 that little Page 27, do you see where it says, "But 16 not everything"? 17 A. Yes. 18 Q. Do you see where it says -- sorry. Strike 19 that. 20 Do you see that this is a response by 21 Dr. Janet in this deposition? 22 A. Uh-huh, yes.
22 1 identification.) 2 A. Are we doing both '405, '381, and '750 all 3 together? 4 Q. Sorry. You just testified that you reviewed 5 Dr. Janet's transcript for the '405 patent IPR. So 6 I'm introducing that '405 patent IPR transcript in the 7 '381 patent and '750 patent IPRs. 8 Can we mark this as Exhibit 2019 for the 9 '381 patent IPR. 10 (Exhibit 2019 marked for identification.) 11 A. Could we take a break for a minute? 12 Q. Sure. 13 (Recess taken.) 14 Q. I just introduced as, I'm calling it Exhibit 15 2019 for the '381 patent and '750 patent IPRs, I just 16 introduced your transcript -- sorry, Dr. Janet's 17 transcript of his deposition in the '405 patent IPR. 18 This is Exhibit 1034 in the '405 patent. Do you see 19 that? 20 A. Uh-huh. 21 Q. So can you turn to Page 27 of Exhibit 2019. 22 A. On the bottom right-hand corner page?	24 1 Q. And do you see at Line 17 on Page 27, do you 2 see that he says, "But not everything is listed of the 3 projects that I oversaw. But you may notice under 4 Duke University and possibly at NC State University 5 it's listed. But at both places the courses that I 6 taught were project intensive, building, operating, 7 utilizing in some way, shape, or form robotics, and 8 that included, I would say, a good portion of those 9 were mobile robots and a good portion of those mobile 10 robots had LiDAR systems on them of various types"? 11 Do you see that? 12 A. I see that. 13 Q. And now let's return to Dr. Janet's CV, which 14 is Exhibit A to Exhibit 2009, that we were just 15 looking at. 16 A. Okay, the same page. 17 Q. So I'd actually like you to turn to Page 4 of 18 his -- of Dr. Janet's CV in Exhibit 2009. 19 A. Okay. 20 Q. Do you see the entry for Duke University? 21 A. That's the top of the page? 22 Q. Correct.

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25 1 A. Yeah. 2 Q. And do you see that Dr. Janet was a professor 3 at Duke University from 1999 to 2021? 4 A. I see that. 5 Q. And do you see the entry for North Carolina 6 State University School of Engineering toward the 7 middle of the page? 8 A. I see that. 9 Q. Do you see that Dr. Janet was a researcher 10 from 1992 to 1996 at North Carolina State University 11 School of Engineering? 12 A. I see that. 13 Q. And do you see that he was an instructor from 14 1996 to 1999? 15 A. I see that. 16 Q. And do you see that he was a professor from 17 2000 to 2020? Do you see that? 18 A. I see that. 19 Q. And turning back to Dr. Janet's deposition 20 transcript in the '405 IPR; that's Exhibit 2019. Can 21 you please turn to Page 33 of the deposition 22 transcript. Just go two pages further.	27 1 fitted one with a radar system, and we made efforts to 2 fit the other with a LiDAR variant." Do you see that? 3 A. I see that. 4 Q. And then on that same larger page, but Page 5 35 of the deposition transcript, do you see that on 6 that same page you're looking at now? 7 A. On 35? 8 Q. So this is Page 35 of the deposition 9 transcript, so the little box on that same page. 10 A. Okay. 11 Q. Do you see Page 35 of the deposition 12 transcript? 13 A. Okay, yeah, got it. 14 Q. Sorry. Do you see at the very bottom of Page 15 35 of Dr. Janet's deposition transcript, do you see 16 there's a question that starts, "How much time"? Do 17 you see that? 18 A. Yes. 19 Q. So reading further, do you see that it says 20 starting at Line 22 of Page 35 of Dr. Janet's 21 deposition transcript, do you see that it says, "How 22 much time across your academic and professional
26 1 A. Okay. 2 Q. Do you see Page 33 of Dr. Janet's deposition 3 transcript? 4 A. I have it. 5 Q. And do you see, starting at Line 3 on that 6 page where Dr. Janet responds, "But among other 7 things"? Do you see that? 8 A. Okay. 9 Q. And do you see that Dr. Janet says, reading 10 further, "But among other things, we participated in 11 the DARPA Grand and Urban Challenge, challenges plural 12 I should say. And I believe the first one that we 13 participated in, the Grand Challenge, we didn't really 14 have a commercial off-the-shelf LiDAR option. But 15 subsequent challenges, especially and including the 16 Urban Challenge, we did. When we could buy them 17 off-the-shelf, we did, so it was more of an 18 integration and an application and a post-signaling 19 processing effort, not necessarily working at the 20 optics and emitter detector level. But when we were 21 looking at fielding both of the red team vehicles for 22 the Grand Challenge, the first Grand Challenge, we	28 1 career, how much time would you say you spent building 2 or designing LiDAR systems?" And then Mr. Lauppe, 3 "Object to form." And then do you see that Dr. Janet 4 answers, "I couldn't tell you the specific amount of 5 time. And I don't know that we got to all of the 6 other postgraduate work either that involved LiDAR 7 systems, including at Teledyne. But I would say if 8 you add it all up, I wouldn't be surprised if it's in 9 the -- I wouldn't be surprised if it's in the 10 thousands of hours. It's just one of those sensors 11 that a lot of times we try to design around and you 12 realize that you -- you just can't, the computer 13 vision, best of intentions, and we've had so many 14 great successes over the years, myself and various 15 teams -- teammates with computer vision. But at the 16 end of the day, the LiDAR system is a low-power, 17 robust ranging system for building point clouds that 18 is very difficult to operate without. So I would be 19 surprised if it's less than a couple of thousand 20 hours, man-hours." Do you see that? 21 A. What's a couple -- one, two, three? I remind 22 you there are 2,000 hours in a year, in a man-year

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29 1 2,000 hours. So he has he spent 2,000 hours designing 2 LiDAR experience (sic) to obtain the requisite POSITA 3 experience? 4 This answer is all -- it doesn't tell me 5 really anything about how much hands-on experience 6 this man has in LiDAR experience. There are 2,000 7 man-hours in a year. Two years would be 4,000 8 man-hours. And how much he got involved with in 9 actually doing the LiDAR system is all obfuscated in 10 his answer. And he talks about machine shop and he 11 talks about all these things. We all did that. We 12 all do that. 13 But the actual time he spent in designing 14 the LiDAR systems -- and I don't know the time frame 15 that he's talking about on these things. In the 16 literature there are a lot of LiDAR systems that he 17 could use. And I just don't see that experience here. 18 And I think it really is quantified in his 19 answer. "I couldn't tell you the specific amount of 20 time, and I don't know that we got to all of the other 21 postgraduate work either that involved LiDAR systems, 22 including at Teledyne. But I would say if you add it	31 1 Petition 'depends on the view that any overlap between 2 emission and detection regions is sufficient'"? Do 3 you see that? 4 A. I see that. 5 Q. So is it your opinion that not any overlap 6 between emission and detection regions is sufficient 7 for those regions to be coincident with each other for 8 the '381 patent claims? 9 MR. DEUTSCH: Objection, form, scope. 10 A. I think if you look at the Paragraph 54 and 11 you look at the bottom of Paragraph 54 and the 12 comparison of the Imai with the '750 patent, the 13 irradiation range of each LD is set to be slightly 14 larger than the corresponding light receiving ranges 15 of the four photodetectors. And if you look at '750 16 it says that is substantially coincident and 17 substantially the same size or minimally larger than 18 the field of view. I think that says it all. 19 Q. Just returning to that sentence in Paragraph 20 53, you say, "Patent owner also incorrectly states 21 that the Petition 'depends on the view that any 22 overlap between emission and detection regions is
30 1 all up, I wouldn't be surprised if it's in the -- I 2 wouldn't be surprised if it's in the thousands of 3 hours." 4 Can we stop? 5 MR. LAUPPE: Let's take a break. 6 (Recess taken.) 7 MR. LAUPPE: Let's go back on the record. 8 Q. Let's change gears. Dr. Shanley, can you 9 please turn to Paragraph 53 of your reply declaration 10 in the '381 patent IPR. This is Exhibit 1040. 11 A. Page 53? 12 Q. Sorry, Paragraph. 13 A. Oh, Paragraph 53. 14 Yes. 15 Q. So do you see that in Paragraph 53 of your 16 declaration you're talking about the Imai grounds? 17 A. Yes. 18 Q. So can you please go to the bottom of 19 Paragraph 53. It's actually on the next page. 20 A. Okay. 21 Q. Do you see at the bottom of Paragraph 53 you 22 say, "Patent owner also incorrectly states that the	32 1 sufficient.'" Correct? 2 A. Can you read that again? 3 Q. Of course. So you see at the bottom of 4 Paragraph 53 of your reply declaration in the '381 5 patent IPR, you say, "Patent owner also incorrectly 6 states that the petition 'depends on the view that any 7 overlap between emission and detection regions is 8 sufficient.'" Correct? 9 A. Well, what it reads is that the patent 10 owner's narrow language covers substantially the same 11 area in the field for the term "coincident with." I 12 know that the patent owner incorrectly alleges that 13 Imai only discloses emission regions that are 14 significantly larger or smaller than the detection 15 regions of the corresponding detectors. Patent owner 16 also incorrectly states that the petition depends on 17 the view that any overlap between emission and 18 detection regions is sufficient. 19 And then we go on to Paragraph 54, where 20 we quantify and show the corresponding Imai and '750 21 patent. 22 Q. Well, so what is incorrect about the view

33 1 that any overlap between emission and detection 2 regions is sufficient for the '381 patent claim 3 language? 4 MR. DEUTSCH: Objection, form. 5 A. I think, you know, it's stated very 6 succinctly, then explained in Paragraph 53 and 54, and 7 I stand by that. 8 Q. But I'm trying to get at your basis for this 9 sentence, "Patent owner also incorrectly states that 10 the Petition 'depends on the view that any overlap 11 between emission and detection regions is 12 sufficient.'" So what is your basis for that 13 statement? 14 MR. DEUTSCH: Objection, form, asked and 15 answered. 16 A. It's my analysis of the patent, and I stated 17 it pretty clearly in the declaration. 18 Q. So in your opinion, is there a minimum amount 19 of overlap between emission and detection regions that 20 is necessary for those regions to be coincident with 21 each other? 22 MR. DEUTSCH: Objection, scope.	35 1 the emission region is 'slightly larger'/'minimally 2 larger' than the pixel field of view." 3 And then it shows those two examples of 4 Imai and the '750 patent. And I think that's pretty 5 clear. 6 Q. So if emission and detection regions don't 7 overlap at all, those aren't coincident with each 8 other; correct? 9 MR. DEUTSCH: Objection, scope. 10 A. Again, I go back to 54, Paragraph 54, and 11 that explains it. 12 Q. Just to confirm, you can't tell me, sitting 13 here today, yes or no, whether there is a minimum 14 amount of overlap between emission and detection 15 regions that is necessary for those regions to be 16 coincident with each other? 17 MR. DEUTSCH: Objection, form, and calls 18 for speculation. 19 A. Yeah, I can't speculate, because the analysis 20 I did is contained in the declaration in Paragraphs 53 21 and 54, and it shows the comparison, and it explains 22 "slightly larger," "minimally larger," and it does a
34 1 A. Again, I stated it and showed examples. I 2 quoted Imai in my declaration, and I quoted the same 3 region from the '750 patent, and I stand by those. 4 Q. So you can't tell me sitting here today 5 whether there is a minimum amount of overlap between 6 emission and detection regions for those regions to be 7 coincident with each other? 8 MR. DEUTSCH: Objection, form; objection, 9 scope. 10 A. It's explained in the Imai and the '750 11 comparison on Page 33 in my declaration. 12 Q. So where does it explain here on Page 33 of 13 your declaration that there is a minimum amount of 14 overlap between emission and detection regions that is 15 necessary for those regions to be coincident with each 16 other? 17 MR. DEUTSCH: Objection, form. 18 A. In Paragraph 54, "In reality, Imai's 19 description is just like the description of the '381 20 Patent concerning the size of a field of view relative 21 to the corresponding emission region. For example, 22 Imai and the '381 Patent describe examples in which	36 1 comparison of the two patents. 2 Q. Let's turn to Paragraph 31 of your reply 3 declaration in the '381 patent IPR, Exhibit 1040. 4 A. 31? 5 Q. Yes. Do you see in Paragraph 31 in the 6 middle where you say, "Based on my review of 7 Retterath, Retterath does not disclose any embodiments 8 or examples where a size of an emission region is more 9 than slightly different than a size of the 10 corresponding field of view"? Do you see that? 11 A. I see that. 12 Q. Does Retterath use the word "slightly 13 different"? 14 A. Can we have Retterath's patent? 15 Q. Of course. I'm going to introduce this as 16 Exhibit 1005, which is Retterath in the '381 patent 17 IPR. 18 (Exhibit 1005 previously marked for 19 identification.) 20 A. I would have to go through. It would take me 21 a while to go through Retterath's patent to answer 22 that statement. But I stand by what's written in my

37 1 deposition -- or in my declaration. 2 Q. So you don't know sitting here today whether 3 Retterath uses the words "slightly different"? 4 MR. DEUTSCH: Objection, form. 5 A. Based on my analysis and what's in my 6 declaration, I stand by what's in my declaration. And 7 for further review, I would have to go back and look 8 through the patent, which would take me a while. 9 Q. Feel free to take any time that you need. 10 A. It's too ponderous at this point. But I 11 stand by my declaration. I did a thorough analysis, 12 and what I wrote down is what I believe to be true. 13 And the statement -- 14 What I put in my declaration is true. And 15 the statement that "Retterath depicts the emission 16 regions and corresponding fields of view as being 17 virtually the same size (see Figs. 4 and 8)" -- I 18 think that speaks for itself in terms of the question. 19 Q. Please turn to Paragraph 34 of your reply 20 declaration in the '381 patent IPR. 21 A. Okay. 22 Q. Do you see that you're discussing Figure 2A	39 1 1008, does Figure 2A show those non-sensitive areas? 2 MR. DEUTSCH: Objection, form. 3 A. So the patent owner is asserting there is no 4 physical boundary or space between the field of view 5 of one of Weimer's pixels and the field of view -- 6 That's correct. I'm reading from my 7 declaration. In fact, a POSITA would have recognized 8 there would be non-sensitive areas between pixels, and 9 you need that separation to reduce crosstalk, but 10 that's not addressed by patent owner. So I stand by 11 that statement, and it's consistent, I believe, with 12 Figure 2A. 13 Q. But are those non-sensitive areas you're 14 discussing there, are those shown in Figure 2A of 15 Weimer, Exhibit 1008? 16 A. Can you repeat the question? 17 Q. Sure. Are those non-sensitive areas you're 18 discussing in Paragraph 35 of your reply declaration, 19 the '381 patent IPR, are those non-sensitive areas 20 shown in Figure 2A of Weimer? 21 MR. DEUTSCH: Objection, scope. 22 A. Could I see the declaration that this refers
38 1 of Weimer in this paragraph? 2 A. Yes. 3 Q. Let's take a look at Weimer. This is Exhibit 4 1008 in the '381 patent IPR. 5 (Exhibit 1008 previously marked for 6 identification.) 7 A. Figure 2A? 8 Q. Figure 2A; if you could turn there. 9 So please turn to Paragraph 35 of your 10 reply declaration in the '381 patent IPR. 11 A. Okay. 12 Q. This is actually starting lower down in the 13 paragraph. 14 A. Over on Page 22? 15 Q. Correct. Do you see toward the bottom of the 16 paragraph where you say, "A POSITA would have 17 recognized there would be non-sensitive areas between 18 pixels (e.g., that provide physical separation or 19 reduce crosstalk), but that is not addressed by Patent 20 owner"? Do you see that? 21 A. I see that. 22 Q. So looking at Figure 2A of Weimer, Exhibit	40 1 to and the diagram? In other words, in Paragraph 2 35 -- I'd like to see the annotated figure, including 3 the pink squares and green circles. Do we have that? 4 Q. So you're referring to Dr. Janet's 5 declaration. 6 A. Yes. 7 Q. We already have that in front of us, I think. 8 That's Exhibit 2009. 9 A. Figure 2A in the declaration is on Page 101. 10 Q. Are you finished answering? 11 A. No. 12 Basically, if we go to Janet's 13 declaration, he says, "Each of Weimer's" -- I'm 14 talking about Paragraph 195. And he colors in -- he 15 shows this grid performance, and he colors in the 16 area. And if we look at these diagrams in Figure 2A 17 and Figure 2D, how does he know to color in what is 18 emitter and what is detector area? I don't know how 19 you can get a circular emitter or circular detector 20 and have a different region, that square region. 21 So I go to my declaration, and it's very 22 confusing, his analysis on Page 100 and 101 of these

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41 1 two figures, and it doesn't make sense to me. What it 2 says is that the patent owner, based on that 3 declaration, is asserting there is no physical 4 boundary or space between the field of view of one of 5 Weimer's pixels and the field of view of an adjacent 6 pixel. So these diagrams didn't make sense to me in 7 terms of his analysis. I stand by what I put in my 8 declaration. 9 MR. LAUPPE: Strike as nonresponsive. 10 Q. I'm simply asking, Dr. Shanley, does Figure 11 2A of Weimer, does Figure 2A show the non-sensitive 12 areas you're discussing at Paragraph 35 of your reply 13 declaration in the '381 IPR? 14 MR. DEUTSCH: Objection, form; objection, 15 scope. 16 A. I think it's pretty apparent from my 17 declaration. "In fact, a POSITA would have recognized 18 that there would be non-sensitive areas between pixels 19 (for example, that provide physical separation and 20 reduce crosstalk)," and I think that's pretty obvious. 21 That's my answer. 22 Q. Let's turn to Paragraph 18 of your reply	43 1 A. Well, first of all, I don't want to comment 2 on the interpretation of it. I think I stand by 3 what's in this paragraph -- not "I think." I stand by 4 what's in the paragraph. 5 Q. So you don't know, sitting here today, 6 whether the embodiments you're discussing here, 7 whether those are preferred embodiments in the '381 8 patent? 9 MR. DEUTSCH: Objection, scope. 10 A. I stand by what's written in the paragraph of 11 my declaration. 12 Q. Let's turn to Paragraph 50 of your reply 13 declaration. Do you see where you say in Paragraph 50 14 of your reply declaration in the '381 patent IPR, do 15 you see where you say, "I understand that Patent Owner 16 asserts that the combination presents 'risk of 17 interference from light scattered by the underside of 18 Hipp's shadow mask.' POR, 48-49. A POSITA would not 19 have been dissuaded by this risk, whether or not SPADs 20 were used. Hipp not only acknowledges this potential 21 scenario, but offers the traditional solution in which 22 'the rear side of the carrier glass is provided with a
42 1 declaration in the '381 patent IPR. 2 A. Paragraph 18 on Page 12? 3 Q. Correct. Do you see at the top of Paragraph 4 18 in your reply declaration in the '381 patent IPR 5 you say, "I have been informed that a fundamental 6 cannon of claim construction is that a claim 7 interpretation that excludes a preferred embodiment 8 from the scope of the claim is rarely, if ever, 9 correct"? Do you see that? 10 A. I see that. 11 Q. And do you see in that same paragraph on the 12 next page -- starting on that same page, do you see 13 where it says, "For example, Patent Owner applies its 14 proposed construction in a way that excludes 15 embodiments described in the '381 patent in which the 16 field of view is not the same as the emission region"? 17 Do you see that? 18 A. I see that. 19 Q. Are the embodiments that you're discussing 20 there, are those preferred embodiments? 21 MR. DEUTSCH: Objection, form; objection, 22 scope.	44 1 layer of material absorbing signal light.' Exhibit 2 1007, 22:7 to 10; see also Exhibit 1003. This 3 solution would have been recognized as applicable 4 regardless of the detector type." Do you see that? 5 A. I see that. 6 Q. So in your view, the Retterath, Borowski, 7 Hipp combination -- 8 So in your view, the Retterath, Borowski, 9 Hipp combination would include this light-absorbing 10 layer disclosed by Hipp? 11 MR. DEUTSCH: Objection, form, 12 mischaracterizes the testimony. 13 A. I think this states it pretty well: "The 14 solution would have been recognized as applicable 15 regardless of detector type. Simply put, based on 16 knowledge and experience," you know, and we skip a few 17 lines, "I believe that a POSITA would have been 18 motivated to implement Hipp's solution, especially in 19 view of its express teaching that application of an 20 absorbing material on the rear side of the carrier 21 glass would effectively reduce unwanted noise." 22 And that is pretty -- the combination of

45 1 these patents plus experience in the field would 2 render one to implement the design in this particular 3 manner that's described in Paragraph 50. 4 Q. We've been going about an hour. Can we take 5 a short break, just for the court reporter's sake. 6 (Recess taken.) 7 Q. Let's turn to Exhibit 1001, which is the '381 8 patent. I'm introducing 1001 in the '381 IPR. 9 (Exhibit 1001 previously marked for 10 identification.) 11 Q. And please turn to Page 22 of Exhibit 1001, 12 Dr. Shanley. 13 A. Page 22? 14 Q. Yes. Do you see column 17 on Page 22? 15 A. Oh, the patent. I'm sorry. I'm in the 16 declaration. Page 17? 17 Q. So this is column 17 on Page 22. 18 A. Okay. 19 Q. And do you see starting at Line 28 is claim 3 20 of the '381 patent? 21 A. Which paragraph? 22 Q. Sorry, so this is on column 17.	47 1 Q. What is your understanding per claim 3 of the 2 '381 patent of one arrangement being proportional to 3 another arrangement? 4 MR. DEUTSCH: Objection, form, scope. 5 A. I address that in my declaration. 6 I address that in my declaration. I just 7 have to look for the.... 8 I think if we go to Page 15, and the 9 proportional to the first arrangement.... 10 I know I covered that in the patent -- or 11 in my declaration. And I think that has to do with -- 12 I think part of it is summarized here in Section B on 13 Page 16, and 23, Item 23. 14 Q. So where in Item -- or Paragraph 23 of your 15 reply declaration -- 16 A. I guess the question is what is your question 17 in terms of -- what are you asking me in terms of this 18 claim 3? 19 Q. So looking at the language of claim 3, we 20 were just discussing claim 3 requires that the second 21 arrangement be proportional to the first arrangement. 22 Correct?
46 1 A. Right. 2 Q. Line 28. Do you see claim 3? 3 A. Yes. 4 Q. And do you see that claim 3 recites "the 5 optical system according to claim 1 wherein the 6 plurality of optical emitters are arranged in a first 7 arrangement and the plurality of pixels are arranged 8 in a second arrangement, proportional to the first 9 arrangement"? 10 A. I see that. 11 Q. So claim 3 requires that the second 12 arrangement be proportional to the first arrangement; 13 correct? 14 MR. DEUTSCH: Objection, form. 15 A. That's what the claim states. 16 Q. What is your understanding of one arrangement 17 being proportional to another arrangement per claim 3 18 of the '381 patent? 19 A. Can we go to my declaration? 20 Q. Sure. You have it in front of you. 21 A. The second declaration. 22 Okay, and your question?	48 1 A. Correct. 2 Q. And so what is your understanding of one 3 arrangement being proportional to another arrangement 4 per claim 3? 5 MR. DEUTSCH: Objection, scope and asked 6 and answered. 7 A. I discuss this in my declaration. 8 Q. Can you point me to where? 9 A. Yeah, I mean, basically, you know, "I note 10 again there is no need to formally construe language 11 of claim 3 in view of the similarity" -- 12 If we go to Paragraph B, and Item 23, and 13 we begin the paragraph, "I note again," and go down to 14 the fact that, "I disagree with the Patent Owner's 15 interpretation of claim 3 that includes 16 emitter/detector arrangements that cannot be reduced 17 to a scaling factor." "It is clear that Patent 18 owner's proposal is unsupported by the '381 Patent and 19 imports limitations such as 'a scaling factor' that 20 are not provided in the claim." 21 Basically it goes on to say in Paragraph 22 24 there is nothing to support narrowing claim 3 to

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49 1 require arrangements that are related by a scaling 2 factor and to exclude arrangements that cannot be 3 reduced to a scaling factor. And I stand by that 4 structure -- by that statement. 5 Q. So here you appear to be talking about what 6 you call patent owner's interpretation of claim 3; is 7 that correct? 8 A. This is my interpretation of the -- of claim 9 3. 10 Q. But so looking back at the language of claim 11 3, what does it mean for a second arrangement to be 12 proportional to a first arrangement? 13 MR. DEUTSCH: Objection, form; objection, 14 scope; asked and answered multiple times. 15 A. Yeah, I think it's pretty clear. Paragraph 16 24 arrangements that are related by a scaling factor 17 and to exclude arrangements that cannot be reduced to 18 a scaling factor -- I think that this 23 and 24 state 19 it pretty well, what my opinion on that is. 20 Q. So Dr. Shanley, do you understand that as an 21 expert witness in this proceeding you have an 22 obligation to answer my questions in good faith today?	51 1 Q. Do you understand that the transcript of 2 today's deposition is going to be lodged with the 3 Board? 4 A. I understand. 5 Q. I'm just wondering, because we've had -- I've 6 met with you for a couple of depositions in these 7 cases, and your demeanor appears pretty significantly 8 different today and not particularly helpful. So I'm 9 just wondering what's behind that difference, because 10 I think in prior conversations we've had pretty civil 11 discussions about the patents at issue here. 12 MR. DEUTSCH: Counsel, I'd caution you to 13 return to questioning or we'll stop. 14 A. I've done extensive analysis on this area and 15 in good faith put in my declarations my views, and I 16 just stand by those views in my declaration. 17 Q. Did counsel coach you not to answer any of my 18 questions today? 19 MR. DEUTSCH: Objection, calls for 20 privileged conversations. 21 A. No. Yeah, I mean.... 22 MR. DEUTSCH: You can answer.
50 1 MR. DEUTSCH: Objection. Counsel, we can 2 stop. 3 MR. LAUPPE: Sorry? The question is 4 pending. 5 A. Yes. 6 Q. And do you have an understanding that as an 7 expert witness in this proceeding you have an 8 obligation to answer my questions truthfully today? 9 A. Yes. 10 Q. Is there any reason you can't provide 11 truthful testimony today? 12 A. I've provided it, and I go to my declaration, 13 and based upon my analysis, that's the truthful 14 answer. 15 Q. Do you understand that as an expert witness 16 in this proceeding you have an obligation to answer my 17 questions to the best of your ability today? 18 A. I stated yes. 19 Q. And do you understand that the transcript is 20 going to be lodged with the Board of today's 21 deposition? 22 A. Please repeat that.	52 1 THE WITNESS: I can answer? 2 A. Yeah, I mean, counsel said to answer to the 3 best of my ability. 4 MR. LAUPPE: Well, we object to the way 5 that the witness has comported himself today. We 6 don't think this is, you know, legitimately making him 7 available for cross-examination because he has 8 repeatedly refused to answer my questions today. And 9 so we reserve our rights in that regard to strike his 10 testimony or to seek other relief. 11 MR. DEUTSCH: We object on the basis of 12 how counsel has approached the witness. Are there any 13 further questions? 14 MR. LAUPPE: I have a few further 15 questions. 16 Q. So let's take a look at -- let's turn to the 17 '750 patent IPR, Dr. Shanley, so let's take a look at 18 Exhibit 1001 in that proceeding, which is the '750 19 patent. I'll put that in front of you. 20 (Exhibit 1001 previously marked for 21 identification.) 22 Q. And let's turn to column 16, which is on Page

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1 21. 2 A. Okay. 3 Q. Do you see claim 1, starting at the bottom of 4 column 16? 5 A. Yes. 6 Q. And do you see starting at line 63 where 7 claim 1 recites "non-overlapping fields of view beyond 8 a threshold distance in a field external to the 9 optical imaging system"? 10 A. Yes. 11 Q. Let's turn to Retterath, which is Exhibit 12 1005 in the '750 IPR. Oh, you already have Retterath, 13 actually. Do you see Retterath there? 14 A. Yes. Do we also have my declaration for the 15 '750 patent? 16 Q. Yes, here's your reply declaration for the 17 '750 IPR. 18 (Exhibit 1040 previously marked for 19 identification.) 20 Q. Can you turn to Figure 10 of Retterath. 21 A. This figure? 22 Q. Correct. And just to sync you up with where	53 1 Retterath -- please point me to where the threshold 2 distance is in this figure. 3 MR. DEUTSCH: Objection, form and scope. 4 A. If I look in my declaration for Retterath and 5 I go to Figure 10 in the patent and translate my 6 Retterath diagram from the declaration to the 7 diagram -- I point that out in my declaration where 8 the non-overlapping region is beyond the threshold 9 distance. 10 Q. So is the threshold distance where the arrows 11 are pointing in the demonstrative diagram at the top 12 of Page 30 of your reply declaration in the '750 13 patent IPR? 14 MR. DEUTSCH: Objection, form. 15 A. I say it's beyond the threshold distance. 16 Q. So where the arrows are pointing in Figure 10 17 of Retterath at the top of Page 30 of your reply 18 declaration in the '750 patent IPR, where those arrows 19 are pointing, that's beyond the threshold distance; is 20 that correct? 21 A. Yes. And I also point out that there is 22 never in the information we have a numeric
54 1 I'm looking in your declaration, if you look at 2 Exhibit 1040 in the '750 patent IPR, if you look at 3 Page 30, which is Paragraph 48. That's in your '750 4 patent reply declaration. 5 A. I'm sorry, Page what again? 6 Q. If you turn to Page 30 in the upper page 7 numbers. 8 A. In my declaration. 9 Q. In your declaration, yeah. 10 A. Yes. 11 Q. And you see the demonstrative diagram at the 12 top of Page 30? 13 A. Yes. 14 Q. And do you see where you've included Figure 15 10 of Retterath? 16 A. Yes. 17 Q. So do you see in this demonstrative diagram 18 you say, "Non-overlapping beyond a threshold distance 19 in a field external to the optical imaging system," 20 and you've included arrows to Retterath; right? 21 A. Yes. 22 Q. So can you point me in Figure 10 of	55 1 quantification of where that threshold distance is. I 2 think that's pretty clear. We refer to a threshold 3 distance, and no one points out a quantification of 4 what that number or where that distance is. 5 Q. But can you point me to that threshold 6 distance in Figure 10 of Retterath? 7 MR. DEUTSCH: Objection, form, scope. 8 A. I think I've stated that, because we can't 9 quantify that, and so without a numeric 10 quantification, I can't say and point to an exact 11 position where it is. I can just say where the 12 non-overlapping region is beyond the threshold 13 distance. 14 Q. But how do you know there's a threshold 15 distance if you can't point to one in Figure 10? 16 MR. DEUTSCH: Objection, form, 17 mischaracterizes the testimony. 18 A. I don't know how to answer that question, 19 actually, because there is a threshold distance that's 20 required by this optical system, and so, you know, we 21 haven't numerically quantified it, so I cannot point 22 to it. But I can show you where in just general where 56

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57 1 that region would be. 2 Q. Does Retterath mention a threshold distance? 3 MR. DEUTSCH: Objection, form. 4 A. Again, my memory -- I'd have to go back in my 5 declaration, you know, and look in the -- based on, 6 you know, my declaration. And to the best of my 7 knowledge, in Paragraph 48 I say that it's apparent 8 that Retterath provides at least as much detail 9 concerning the threshold distance as the '750 patent 10 does. 11 And so, you know, what we're saying is, 12 what is that numeric quantification of that, where is 13 that region? And they both basically reference it. I 14 guess it's further quantified by "In both cases the 15 field of view for a given detector does not 16 overlap" -- 17 If we go to Paragraph 48, basically the 18 third line down, and it starts "In both cases," and it 19 goes on to say that the "given detector does not 20 overlap but the field of view for all other detector 21 elements at a threshold distance beyond the macro 22 lens" --	59 1 A. Let me -- 2 Going back -- and I'm going to my memory, 3 using my declaration to understand it. If I go to 4 Paragraph 49, based on my analysis and the best of my 5 memory, the '750 patent never requires or even 6 mentions a numeric quantification of the threshold 7 distance, and it provides even fewer details than 8 Retterath provides concerning the threshold distance. 9 That's the best of my knowledge of that. 10 I would have to go back and do a detailed analysis, 11 going through the patents, to further give you an 12 explanation of that. But this is what I remember and 13 wrote it down. 14 MR. LAUPPE: Those are all my questions 15 for the '750/'381 patent IPRs today. But I have some 16 questions for the '405 patent as well. 17 Do you have any questions for these two? 18 MR. DEUTSCH: They'll be completely 19 separate transcripts of the proceeding. No further 20 questions, and we'll end this proceeding. 21 (The deposition concluded at 11:20 a.m.) 22
58 1 So I think both patents allude to that but 2 don't quantify numerically. And if we had the optical 3 codes and did the precise design, we would quantify 4 numerically that distance. 5 Q. So you say -- you just referenced it in 6 Paragraph 48 of your reply declaration -- you say in 7 Paragraph 48 of your reply declaration in the '750 8 patent IPR, do you see where you say, "It is apparent 9 that Retterath provides at least as much detail 10 concerning the 'threshold distance' as the '750 patent 11 itself"? Do you see that? 12 A. Yes -- to my knowledge, yes. 13 Q. What detail concerning the threshold distance 14 does the '750 patent provide? 15 MR. DEUTSCH: Objection, form. 16 A. I guess what are you asking me? 17 Q. So you haven't included a citation for this 18 sentence, so I'm just wondering, what is your basis 19 for your reference to the detail that the '750 patent 20 provides concerning the threshold distance? 21 A. Well, if we -- 22 MR. DEUTSCH: Same objection.	60 1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC 2 3 I, Alan H. Brock, Certified Reporter 4 and Notary Public within and for the Commonwealth of 5 Massachusetts, do hereby certify: 6 That James F. Shanley, Ph.D., the witness 7 whose deposition is hereinbefore set forth, was duly 8 sworn by me before the commencement of such deposition 9 and that such deposition was taken before me and is a 10 true record of the testimony given by such witness. 11 I further certify that the adverse 12 party, PETITIONER, was represented by counsel at 13 the deposition. 14 I further certify that the deposition 15 of James F. Shanley, Ph.D. occurred at the offices of 16 Cooley LLP on Wednesday, November 6, 2024, commencing 17 at 9:22 a.m. to 11:20 a.m. 18 I further certify that I am not 19 related to any of the parties to this action by blood 20 or marriage, I am not employed by or an attorney to 21 any of the parties to this action, and that I am in no 22 way interested, financially or otherwise, in the

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1 outcome of this matter.

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3 IN WITNESS WHEREOF, I have hereunto
4 set my hand this 8th day of November, 2024.

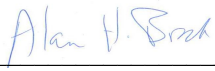
5 My commission expires:

6 March 25, 2027

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10 Alan H. Brock, RDR, CRR

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ability	again	35:19, 37:5,	application
50:17, 52:3	9:10, 15:18,	37:11, 40:22,	26:18, 44:19
about	17:1, 19:22,	41:7, 50:13,	applies
10:18, 15:5,	32:2, 34:1,	51:14, 59:4,	42:13
19:14, 29:5,	35:10, 48:10,	59:10	approached
29:10, 29:11,	48:13, 54:5,	annotated	52:12
29:15, 30:16,	57:4	40:2	area
32:22, 40:14,	ahead	another	9:20, 17:3,
45:4, 49:5,	17:15	46:17, 47:3,	18:4, 32:11,
51:11	alan	48:3	40:16, 40:18,
absorbing	1:22, 60:3,	answer	51:14
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academic	all	29:19, 36:21,	13:20, 16:10,
27:22	3:7, 14:2,	41:21, 49:22,	38:17, 39:1,
according	16:5, 19:13,	50:8, 50:14,	39:8, 39:13,
46:5	22:2, 28:5,	50:16, 51:17,	39:17, 39:19,
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