

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

3  
4 SAMSUNG ELECTRONICS CO., LTD. AND  
5 SAMSUNG ELECTRONICS AMERICA, INC.  
6 Petitioner

7 v.  
8 IMAGE PROCESSING TECHNOLOGIES, LLC  
9 Patent Owner.

10  
11 Case IPR2017-00353  
12 U.S. Patent No. 8,983,134

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13 ORAL DEPOSITION OF  
14 ALAN C. BOVIK, Ph.D.  
15 DECEMBER 15, 2017

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17 ORAL DEPOSITION OF ALAN C. BOVIK, Ph.D., produced  
18 as a witness at the instance of the Petitioner, and duly  
19 sworn, was taken in the above-styled and numbered cause  
20 on December 15, 2017, from 9:39 a.m. to 3:41 p.m.,  
21 before Candice Andino, Certified Shorthand Reporter in  
22 and for the State of Texas, reported by machine  
23 shorthand, at Andrews Kurth Kenyon, LLP, 111 Congress  
24 Avenue, Suite 1700, Austin, Texas, pursuant to the  
25 Federal Rules of Civil Procedure.

Exhibit 2012  
IPR2017-01218  
Petitioner - Samsung Electronics. Co., Ltd., et al.  
Patent Owner - Image Processing Technologies. LLC

Page 2

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

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12 JONG-IN SON

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Page 4

1 FRIDAY, DECEMBER 15, 2017, 9:39 A.M.

2 AUSTIN, TEXAS

3 ALAN C. BOVIK, Ph.D.,

4 having been first duly sworn, was examined and testified

5 as follows:

6 EXAMINATION

7 BY MR. WHILT:

8 Q. Welcome, Dr. Bovik.

9 A. Thank you.

10 Q. Will you please state your full name for the

11 record.

12 A. Alan Conrad Bovik, B-o-v-i-k.

13 Q. And where are you currently employed?

14 A. At the University of Texas at Austin.

15 Q. And where do you currently reside?

16 A. In Austin, Texas. Do you need the street

17 address?

18 Q. No, that's -- that's all right.

19 A. Okay.

20 Q. Now, how many times have you been -- had your

21 deposition taken before today?

22 A. Before today? I think it's very close to

23 almost 35 times.

24 Q. Okay. And have you testified in trials before?

25 A. I have. At trial, around five or six times,

Page 3

1 I N D E X

2 WITNESS: ALAN C. BOVIK, Ph.D.

3 EXAMINATION PAGE

4 BY MR. WHILT..... 4

5 BY MR. COULSON..... 154

6

7 EXHIBITS

8 NO. DESCRIPTION PAGE

9 Exhibit 1011 Figure 4 of Gilbert..... 98

10

11

12 PREVIOUSLY MARKED EXHIBITS

13 (Not attached)

14 NO. DESCRIPTION PAGE

15 Exhibit 1001 U.S. Patent No. 8,983,134..... 12

16 Exhibit 1005 Document entitled "A Real-Time

17 Video Tracking System"..... 73

18 Exhibit 1006 U.S. Patent No. 5,521,843..... 115

19 Exhibit 1007 U.S. Patent No. 5,150,432..... 134

20 Exhibit 2007 Declaration of Dr. Alan Bovik in

21 Support of Patent Owner Response

22 Pursuant to 37 CFR 42.120..... 11

23

24

25

Page 5

1 including this week.

2 Q. Okay. So you're familiar with this process.

3 So I'm just going to go through a few ground rules,

4 although you're probably already familiar with all of

5 these.

6 So if you don't understand any of my

7 questions, please let me know, and I'll try to clarify

8 as best I can.

9 Can we agree to that?

10 A. Sure.

11 Q. Okay. Also, if you do not hear my question or

12 some part of my question, please let me know after I

13 finish and I'll ask the court reporter to read it back

14 to you.

15 Can we agree to that?

16 A. Yes.

17 Q. I'll also ask you just to answer my questions

18 with a verbal response and not answer with nods of the

19 head.

20 Is that understood?

21 A. I'll do my best.

22 Q. Okay. Can you tell me: How did you prepare

23 for today's deposition?

24 A. Well, you know, preparation for the deposition

25 is a -- it's a long process. You know, I -- I, you

<p style="text-align: right;">Page 6</p> <p>1 know, started becoming familiar with these materials  2 when I was first engaged in a related district case.  3 Okay? So I consider, you know, becoming familiar with  4 the '134 patent and the same references as were brought  5 in that case are -- I guess they're still being brought  6 in that case -- as part of my preparation here.  7           So, basically, reading and understanding  8 the patents at issue, the prior art patents, the  9 prosecution history, having significant contemplation,  10 significant discussions with counsel, preparation of an  11 expert report, and going back and forth in that and  12 making sure my opinions are expressed correctly. And,  13 you know, that's -- that's the basics. I'm not trying  14 to be complete. Just -- you know, I'm not trying to  15 memorize everything I did.  16       <b>Q. Okay. And did you meet with counsel to prepare</b>  17 <b>for today's deposition?</b>  18       A. I did.  19       <b>Q. And how much time did you spend meeting with</b>  20 <b>your counsel?</b>  21       A. Well, you know, it depends on whether you mean  22 in person or, you know, by other means, such as, you  23 know, phone or electronically. So, you know, how much  24 time did I spend -- I -- I didn't make a -- try to make  25 an accurate assessment of that, but certainly -- I'll</p>	<p style="text-align: right;">Page 8</p> <p>1 <b>spent on this -- this matter relating to this IPR?</b>  2       A. Okay. So by that, you mean, you know, aside  3 from all the hours I spent in the district case. I -- I  4 would just -- you know, again, I haven't -- I didn't try  5 to look up that number before we came in, but I would  6 say it's around 25 hours, maybe, 30 hours.  7       <b>Q. Okay. And --</b>  8       A. Keep in mind that I have an awful lot of  9 knowledge accrued from my studies of these things before  10 that.  11       <b>Q. And that's because you previously worked on</b>  12 <b>another district court matter for Image Processing</b>  13 <b>Technologies; is that correct?</b>  14       A. Yeah. I -- I'm very familiar with the material  15 of the case.  16       <b>Q. So how much have you billed Image Processing</b>  17 <b>Technologies in connection with all the work you've done</b>  18 <b>for them?</b>  19                   MR. COULSON: Objection. Form.  20       A. That is a good question. I -- I -- I don't --  21 well, first of all, I don't think I should be answering  22 any questions about the district case here. I mean,  23 counsel can advise me otherwise, but I -- I -- I think  24 that that is -- I mean, I think I had to tell you  25 something just to let you know that I've been exposed to</p>
<p style="text-align: right;">Page 7</p> <p>1 just answer this way: Over the last -- let's see.  2 Today's Friday -- after the last -- over the last two  3 days, just in person, I've met with counsel for about  4 eight or nine hours. And I can't -- I probably couldn't  5 come up with an estimate for, you know, other  6 communication/meeting.  7       <b>Q. Okay. So eight or nine years over the last two</b>  8 <b>days?</b>  9       A. Yeah. And, again, I didn't calculate that. I  10 just -- it's a guess.  11       <b>Q. Okay. And you understand you're here</b>  12 <b>testifying as part of a inter partes review</b>  13 <b>proceeding; correct?</b>  14       A. I do.  15       <b>Q. Okay. And you are serving as an expert for the</b>  16 <b>patent owner, Image Processing Technologies; right?</b>  17       A. That is my understanding, yes.  18       <b>Q. Okay. And in that -- in that inter partes</b>  19 <b>review proceeding, you submitted an expert</b>  20 <b>declaration; correct?</b>  21       A. Yes.  22       <b>Q. Okay. And what is your hourly rate that you're</b>  23 <b>charging for your work in connection with this matter?</b>  24       A. For my time, I always charge 500 an hour.  25       <b>Q. Okay. And how much -- how much time have you</b></p>	<p style="text-align: right;">Page 9</p> <p>1 the material, and I think it's important for you to  2 know. But, you know, how many hours I put in that case  3 I think is irrelevant to this case. So...  4       <b>Q. (BY MR. WHILT) I -- I'm just asking you how</b>  5 <b>much you -- you've billed Image Processing Technologies</b>  6 <b>for your -- for time that you've spent on the IPRs or</b>  7 <b>the district court case.</b>  8       A. And that -- and my same answer. I mean, I -- I  9 mean...  10                   MR. COULSON: If you have -- if there's a  11 question about privilege or something, we can take a  12 short break, and I can address your question.  13       A. I think there is a question of privilege there  14 with regard to the district case.  15       <b>Q. (BY MR. WHILT) I'm just asking you how much</b>  16 <b>you've billed. This is a pretty standard question.</b>  17       A. But in a different case; right?  18       <b>Q. That's the question.</b>  19       A. So I'm just -- I'm not a lawyer. Okay? I  20 don't know if that is a privileged information with  21 regards to this case or not. Okay?  22       <b>Q. Okay. Well --</b>  23       A. Okay. Well, let me give -- let me give --  24       <b>Q. -- I'm -- I'm going to ask you the question</b>  25 <b>again.</b></p>

<p style="text-align: right;">Page 10</p> <p>1 A. Let me give an answer. I don't really know. I 2 haven't thought about, you know, those quantities in 3 quite some time. But I would guess that I've probably 4 billed IPT in the two cases -- thus far billed -- 5 actually, I don't think I've billed them in this case. 6 Okay? You know, because -- probably less than 100,000. 7 I'm just guessing. I -- it might be in that ballpark.</p> <p>8 Q. Okay. And how much do you expect to bill them 9 that hasn't -- where you haven't sent out a bill yet?</p> <p>10 A. For --</p> <p>11 Q. You said you haven't sent out a bill yet for 12 certain work. I just want to understand how much you -- 13 you will have billed, in total --</p> <p>14 A. Well --</p> <p>15 Q. -- as of today.</p> <p>16 MR. COULSON: Objection. Form.</p> <p>17 A. You know, in this case, I've already expressed 18 I think it's, like, 25, 30 hours. So, you know, do the 19 math, multiply it by 500, 12, \$15,000.</p> <p>20 Q. (BY MR. WHILT) So for the district --</p> <p>21 A. And nothing -- include today, of course. This 22 is -- I'm here to spend my time. Right?</p> <p>23 Q. So for the district court matter, you've billed 24 IPT around \$100,000; is that right?</p> <p>25 A. Yeah. And, you know, give or -- please</p>	<p style="text-align: right;">Page 12</p> <p>1 MR. COULSON: I'm just going to object or 2 caution the witness not to discuss communications back 3 and forth with counsel, which would include the sending 4 of drafts. But...</p> <p>5 THE WITNESS: Okay. Sure.</p> <p>6 MR. COULSON: You can...</p> <p>7 A. In any case, information was -- I -- I 8 expressed my opinions. I -- I certainly had material 9 that was, you know, based on my instructions drafted for 10 me. I don't write legalese. I'm not a lawyer. So, you 11 know, the process was a back-and-forth one, and in the 12 end, there is a document that is definitely my opinion 13 and which I signed off on.</p> <p>14 Q. (BY MR. WHILT) And -- but counsel assisted you 15 in preparing this declaration; right?</p> <p>16 MR. COULSON: Objection. Form.</p> <p>17 A. I have no objection to that. I mean, I had 18 conversations with counsel, and counsel helped me draft 19 it, you know. Again, you know, I don't write legal 20 style ordinarily.</p> <p>21 (Previously marked Exhibit 1001 referred to.)</p> <p>22 Q. (BY MR. WHILT) Okay. I'm going to also hand 23 you a copy of U.S. Patent No. 8,983,134 that's been 24 marked as -- previously marked as Samsung Exhibit 1001. 25 Okay. So do you recognize Exhibit 1001?</p>
<p style="text-align: right;">Page 11</p> <p>1 understand, I'm not trying to be accurate there. It 2 could be plus or minus 20. I -- I mean, I don't 3 remember these kind of things.</p> <p>4 Q. Okay.</p> <p>5 (Previously marked Exhibit 2007 referred to.)</p> <p>6 Q. (BY MR. WHILT) Okay. I'm going to hand you 7 what's already been marked as Exhibit 2007, the 8 Declaration of Dr. Alan Bovik In Support of Patent 9 Owner's Response Pursuant to 37 CFR 42.120. And this 10 relates to the '134 patent.</p> <p>11 MR. COULSON: Thank you.</p> <p>12 Q. (BY MR. WHILT) And can you just confirm that 13 Exhibit 2007 that you've been handed is the declaration 14 that you submitted in the IPR proceeding 2017-353 that 15 relates to U.S. Patent No. 8,983,134?</p> <p>16 A. It looks like it's probably complete, and so 17 I'll agree with that.</p> <p>18 Q. Did anyone assist you in preparing your 19 declaration?</p> <p>20 A. Well, you know, I -- the beginning of my 21 declaration preparation was when I first started 22 thinking about these patents again. Okay. So it -- 23 it's -- it's a -- it's a process and a conversation 24 between myself and counsel. I, you know, gave them an 25 early draft, and, you know, I --</p>	<p style="text-align: right;">Page 13</p> <p>1 A. Yeah. This is what I refer to as the '134 2 patent.</p> <p>3 Q. Okay. Okay. So in the '134 patent, will you 4 please turn to Figure 21.</p> <p>5 A. Sure.</p> <p>6 Q. Are you familiar with Figure 21?</p> <p>7 A. Yes.</p> <p>8 Q. All right. So in -- for reference, if you turn 9 also to column 24, you'll see that, starting at line 1, 10 there's a discussion of Figure 21.</p> <p>11 A. Correct.</p> <p>12 Q. Now, do you see, in column 24, starting at 13 line 2, the '134 patent states --</p> <p>14 A. Starting at line 2?</p> <p>15 Q. Yeah.</p> <p>16 Do you see column 24, starting at line 2, 17 it states (as read): In order to process the pixels 18 surrounding the starting position, image processing 19 system 204 will process the pixels in successively 20 larger areas surrounding the pixel, adjusting the center 21 of the area based upon the shape of the object, until 22 substantially the entire target area is being tracked.</p> <p>23 Do you see that?</p> <p>24 A. Yes, that's correct. Uh-huh.</p> <p>25 Q. Okay. Now, would you agree that when the</p>

<p style="text-align: right;">Page 14</p> <p>1 specification's referring to processing successively  2 larger areas, it's describing the process of repeatedly  3 increasing the size of the area that's being processed?  4 A. Yes, within a single frame this is occurring.  5 Q. Okay. And in Figure 21, that area that's made  6 successively larger is shown as a -- as a box inside the  7 image; correct?  8 A. Let me make a little mark here because it's  9 hard to find figures in this patent. They're not in  10 very good order.  11 Yes.  12 Q. Okay. And it's the small square in the middle  13 of Figure 21; right?  14 A. Yeah, sure.  15 Q. Okay. And so if -- do you see Figure 22 that's  16 right below Figure 21?  17 A. Uh-huh.  18 Q. Okay. So Figure 22 shows this embodiment we've  19 been discussing where the area being processed has been  20 enlarged; correct?  21 A. So, you know, just for clarity, you know,  22 Figure 22 is described further down in this embodiment,  23 in this column. And it describes, you know, this as  24 a -- you know, the area under consideration begins  25 across the borders of target 218. So, I mean, this is</p>	<p style="text-align: right;">Page 16</p> <p>1 Q. So to step back, Figure 21 shows -- shows a  2 small box that's under consideration, and then that is  3 enlarged, and the enlarged box is illustrated in  4 Figure 22; correct?  5 A. Yes. And there is -- in a further figure, a  6 further enlarged box, in Figure 23.  7 Q. Right. And Figure 22 is supposed to show one  8 of the iterations of successively enlarging the box as  9 you eventually get toward the size of the box that's  10 shown in 20- -- Figure 23; correct?  11 A. In this embodiment. This is one way of, you  12 know, practicing claim 1, yeah.  13 Q. Okay. And in Figure 22, it shows that  14 histograms are created of the particular box size that's  15 shown in that figure; correct?  16 A. I -- I don't think that question is -- is well  17 formed.  18 Q. Let me ask you a different question.  19 Do you see, in Figure 22 --  20 A. Uh-huh.  21 Q. -- that there are elements 222 and 224?  22 A. Yes.  23 Q. Okay. You'd agree those are  24 histograms; correct?  25 A. Well, part of those. I mean, yeah. Sure,</p>
<p style="text-align: right;">Page 15</p> <p>1 a -- a later stage in this iterative process of --  2 of forming the histogram that is -- that this embodiment  3 targets in, you know, explaining claim 1.  4 Q. And by part of the iterative process, you mean  5 this is kind of one step where it's -- you have a box or  6 the particular area that's being processed at a  7 particular size; right?  8 A. Well, one iteration, you may have a box of one  9 size and that box can increase. Okay. Sure.  10 Q. Okay. So whenever there is an enlargement of  11 this area of interest that's shown as a box, Figure 22  12 shows that histograms are formed of that area; correct?  13 A. Well, you know, in Figure 21, you don't see a  14 histogram. Okay? In Figure 22, you do see histograms  15 being formed. In Figure 23, which is, absurdly enough,  16 further back, you see a hist- -- a subsequent histogram  17 that is formed.  18 So, I mean, I have no objection to state  19 that there are histograms formed along the way to  20 forming the histogram that is intended in the embodiment  21 in -- described in claim 1. What we might call the "at  22 least one histogram" of the pixels in, say -- I'll call  23 the first limitation limitation 1(a), and the second  24 one, 1(b), and the third one, 1(c), meaning those are  25 below the preamble.</p>	<p style="text-align: right;">Page 17</p> <p>1 those are -- those show histograms. I'll put it that  2 way. They show histograms.  3 Q. Okay. And the -- are those -- are those  4 referred to as "projection histograms"?  5 A. I won't object to that. I'm fine with calling  6 those projection histograms.  7 Q. Okay. Is it fair to say that 222 is an X axis  8 projection histogram?  9 A. It's fine to call it, you know, a histogram.  10 Also, you know, in figure -- later Figure 23, there are  11 histograms that are shown as well, which we might also  12 call, you know, that.  13 Q. Okay. Let's -- let's stay on Figure 22. So in  14 Figure 22, though, the element 222, you'd agree that's  15 an X axis projection histogram; correct?  16 A. I'm fine with saying that that histogram is  17 projection in the X direction, just -- just so it's  18 agreeable with the notation here.  19 Q. Okay. And 224, in Figure 22, is a -- is a  20 Y ax- -- Y axis projection histogram; correct?  21 A. I'm -- I'm not going to have a problem with --  22 you know, basically, I think we're just setting up  23 notation here.  24 Q. Right. Okay. But you would agree that 224  25 is -- is what you would refer to as a "Y axis projection</p>

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