UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ARASHI VISION (U.S.) LLC (D/B/A INSTA360)
Petitioner,

vs.

GOPRO, INC.,
Patent Owner.

Patent No. 10,574,840

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Inter Partes Review No. IPR2024-01186

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LOCATION: Veritext Orlando
800 North Magnolia Avenue
Suite 400
Orlando, Florida 32803

DATE: July 11, 2025

TIME: 10:00 a.m. - 11:36 a.m.

DEPOSITION OF DR. HASSAN FOROOSH

Taken before Julie Giordano, Florida Professional Reporter, Notary Public in and for the State of Florida at Large, pursuant to Notice of Taking Deposition filed in the above case.

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# I N D E X


TESTIMONY OF DR. HASSAN FOROOSH PAGE

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By Ms. Mao

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## E X H I B I T S

None marked.

Thereupon,

DR. HASSAN FOROOSH,

was called as a witness and, having been first duly sworn, was examined and testified as follows:

THE WITNESS: I do.

DIRECT EXAMINATION

BY MS. MAO:

Q. Good morning --

A. Good morning.

Q. -- Professor. Could you please state your full name, please?

A. Hassan Foroosh.

Q. Do you understand that you're under oath today?

A. Yes.

Q. Is there any reason you cannot testify truthfully or accurately today?

A. No.

Q. You understand the depo procedures, right?

A. Yes.

Q. Okay. And just so we are clear on the record, you're -- you understand that you're here to testify about three IPR proceedings, correct?

A. Yes.

Q. And those proceedings are IPR2024-01164, IPR2024-01165 and IPR2024-01186.

Do you understand that?

A. Yes.

Q. And again, just so we are clear, unless I specify, my questions apply to all three proceedings.

Do you understand that?

A. Yes.

Q. Okay. And if you have questions about which proceeding my question applies to, please just ask me.

A. I will.

Q. Okay. Great.

How many depositions have you participated in?

A. You mean in the past?

Q. Yeah, in the past.

A. I don't remember the exact number, but probably somewhere between eight to ten.

Q. When was your first deposition?

A. When it was my first deposition?

Q. Correct.

A. A few years back. I don't remember the exact year.

Q. Okay. Five years ago or --

A. Maybe. Maybe around five years ago. I don't exactly remember.

Q. What was the subject matter?

A. I'm not sure if I'm allowed to talk about the subject matter, so -- but if it's -- I can tell you that it was -- I was representing Align Technology.

Q. Was it in -- about an IPR proceeding?

A. Yes.

Q. How did you test -- how did you prepare for your deposition today?

A. I had, with the counsel, Mr. Schmidt, multiple Zoom meetings. And we went through my declarations and the exhibits that I've cited.

Q. How long in total were those Zoom meetings?

A. Each meeting was about between two to three hours. We had -- I don't remember -- three or four meetings.

Q. Okay. So about ten hours?

A. Yeah. Roughly.

Q. Did you speak to anyone besides Mr. Schmidt?

A. You mean in preparing?

Q. Correct.
A. No.
Q. You did not talk to anyone from GoPro?
A. No.
Q. And you submitted two declarations for each of the three proceedings, correct?
A. Correct.
Q. And I represent to you that one declaration is for the patent owner preliminary response and the other one is for the patent owner response, correct?
A. Correct.
Q. So you submitted six declarations in total for those three proceedings, right?
A. Correct.
Q. I want to talk to you about your experience a little bit, Professor. What is your current occupation?
A. I'm a professor at the University of Central Florida in the computer science department. I also have courtesy appointment with the electrical engineering department.
Q. How long have you been a professor at the University of Central Florida?
A. I joined in 2002.

Q. And what does your research involve?

A. My area of research is computer vision, image processing, machine learning and more recently natural language processing, in particular, large language models.

Q. Could you briefly walk me through your educational background?

A. You mean all the way back to what level? Can you clarify?

Q. Maybe undergrad.

A. Undergrad, sure. I did my undergrad in England, Kingston University, and I did my first master's degree also -- that was in electrical engineering. I did my first master's degree also over there, same university, Kingston University, also in electrical engineering.

Then I moved back to France and I did my second master's degree in computer science, more specialized in computer vision, at the University of Nice. And I did also my Ph.D., same university. I received my Ph.D. in 1996.

Q. What area did you receive your Ph.D. in?

A. So the general area, computer science, but specializing in computer vision and image

processing.

Q. When you were at your Ph.D. program, did you work on anything related to video stabilization?

A. During my Ph.D. program, I don't recall working exactly what could be referred to as video stabilization, but I did work on video frame alignments which was used as part of another -- another problem.

Q. What does video stabilization mean to you?

A. I mean, you're asking a general question. I'm not sure if I opined on that. If -- would you like to refer me to any one of my declarations?

Q. No. I'm just talking about as a person who, you know -- who has a Ph.D. in area -- image processing and has been a professor in the field of image processing for over 20 years, what is your understanding of video stabilization?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, I don't believe I have opined on that, so if you show me where I opine on that, I would be more than glad to go over that in one -- any one of

my declarations.

BY MS. MAO:

Q. Okay. So you didn't opine on what video stabilization means?

MR. SCHMIDT: Objection. Form.

THE WITNESS: What I'm saying is that I did not provide any constructions, so, I mean, unless you refer me to a specific point where I opined on that or provide a construction, then I would be more than glad to discuss it.

BY MS. MAO:

Q. If your student asks you what is video stabilization, what would you say to your student?

A. Again, this is a hypothetical question.

Q. Uh-huh.

A. And I see that you're asking me to provide the construction, but I did not provide a construction what video stabilization means, give a definition for that. And if you show me where I did that, I would be more than glad to...

Q. I don't think you provided a construction for video stabilization. But sitting here today, you cannot give me an answer as to what

in your mind video stabilization means, correct?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, that would require me to provide some definition which would -- from my point of view, which would be a construction. I'm saying that I did not provide any opinion, I did not render any opinion what video stabilization means.

BY MS. MAO:

Q. Do you have an opinion as to what the basic steps of video stabilization are?

MR. SCHMIDT: Objection to form.

THE WITNESS: Same as before. I did not opine on the steps, if any, required to do video stabilization.

BY MS. MAO:

Q. Dr. Foroosh, I think in your declarations you said that you've done research using GoPro cameras, correct?

A. Correct.

Q. Can you tell me -- let's walk through those projects. What was the first project that you did using a GoPro camera?

A. They were all the same project, plus -- same projects I received funding from the

State of Florida also. They were funded by a company called Jackson Technologies. And I don't remember off the top of my head -- you probably have it in my declaration or my CV -- when that project started. But the problems we were looking at was creating 3D models of the environment of a flying aircraft.

Q. Okay. So you're saying you only did one project using GoPro cameras?

A. It came through multiple fundings, so -- but it was a continuation of the same project. So it may appear as multiple funding as if, you know -- so let's say an initial funding, a project was completed and, you know, deliverables and reports, and then the company came back, continue -- you may call it a second project, but I -- from my point of view, we were continuing on similar problems expanding on the original project.

Q. I understand -- I understand.

Do you know when the project started?

A. I don't remember off the top of my head. Maybe 2014. I don't remember really, I mean, but I guess you have it in my CV.

Q. Okay.

A. So I can tell you -- I mean, if we go

through my CV, I can show you, or in my declaration, I can -- I can tell you -- I'm not sure if I included the year here.

Q. Just for the record, which declaration are you looking at, if you don't mind --

A. I'm looking --

Q. -- mentioning the IPR number and the exhibit number?

A. Yes. I'm looking at the -- U.S. Patent '894. The IPR number is 01186, and the exhibit number is 2018.

Q. Thank you.

A. Again, I don't remember if in my declaration I mentioned what year I did this. Yeah. So -- yeah, I believe on page 5 -- yeah, I'm -- somewhere after halfway through the page, I'm saying that -- on page 5 of that same document, of course, my declaration -- I say from 2013 to 2018, I received related funding from the Florida High Tech -- okay. So, originally -- I'm sorry. Go back a few lines back, I say from 2012 to 2018, I received funding from Jackson Technologies. So between 2012 and 2018, I was working on those projects.

Q. Which -- do you remember which GoPro

camera model that you used?

A. Off the top of my head, I don't remember, no.

Q. Did you use any GoPro software?

A. One of the motivations of using GoPro camera was that we looked at multiple different cameras, and the motivation behind choosing GoPro was specific features that they had.

Q. Which specific features?

A. Like -- like, you know, wide view, SuperView or -- I don't remember off the top of my head, but we looked at multiple features. And we decided that for the application that we are looking for, it's a better suited camera than the ones -- other ones that were in the market.

Q. Which other cameras you looked at?

A. I don't remember off the top of my head.

Q. Are they similar cameras to -- or -- to GoPro's camera that you used?

MR. SCHMIDT: Objection to form.

THE WITNESS: I don't know what you mean by "similar." What do you mean by "similar cameras"?

BY MS. MAO:

Q. Yeah, let me rephrase my question.

What do you -- does GoPro's cameras fall into a certain category to you?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, it's not category of camera that we were looking at. You're asking about this specific project; is that right?

BY MS. MAO:

Q. Let's talk about this specific project first.

A. Yes. So it's not category we were looking at; we were looking at more features, that what features were available on each camera, or different types of cameras that we consider. We decided that GoPro was the best.

Q. And which features were you focusing on?

A. Well, as I said, we were mounting the cameras -- these cameras on an aircraft on the wings, tail, et cetera, so -- and, of course, the camera on an aircraft is on an agile platform, so fast-moving and changing directions and so on and so forth. So we were looking at a camera with features that could handle a scenario like that.

Q. Were you looking at the video stabilization feature?

A. Again, off the top of my head, I don't -- I do not remember. But I would be surprised if we didn't. I think we did definitely.

Q. And what made you decide that -- okay. Scratch that.

Did you decide that GoPro's video stabilization feature was better than the other cameras' video stabilization feature?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, this is long ago, 2012 or 2013. I don't remember off the top of my head what discussions we had with the engineers from the company and my -- my team, my group. And we compared certain number of cameras. I don't even remember which other cameras. I know that we zeroed in on GoPro based on features that we thought are useful for our application.

BY MS. MAO:

Q. Did you use the same camera from 2012 to 2018?

A. I don't think so. I think we -- we purchased different models, so at the, you know,

project from 2012 to 2018.

Q. But you used the same company GoPro's cameras, just different models?

A. We did, yes. We -- we -- we might have thought, Hey, there's a new feature, a useful feature is coming in, and we might have -- I'm -- best of my best recollection, we did. We changed and looked at different models later.

Q. Do you recall any differences between a later GoPro camera model that you used compared to an earlier GoPro camera model that you used?

A. Again, it's too long ago. I don't remember what discussions we had back then with the engineers from the company and my team at UCF. But we benchmarked multiple cameras -- by the way, this wasn't just a single camera mounted. Another aspect that we did -- this was in-house. We built a network of these cameras because we needed to access these cameras simultaneously.

Q. What do you mean by "in-house"?

A. I mean we developed additional capability of networking them while they're mounted on the aircraft. So let's say we have five, six cameras. We wanted to be able to simultaneously access through a local network these cameras.

Q. And this project was done in collaboration with Jackson Technologies, right?

A. That's correct.

Q. What kind of company is Jackson Technologies?

A. It's a very small company. I have lost connections with them. I don't know what they do, if they still exist. It was a small company. The owner of the company -- it was a private company. The owner of the company was an ex-Navy pilot himself. He had a hangar in a local airport here, and he had multiple airplanes, and one of them actually -- he was an interesting guy. He had built his own airplane, and he was flying with it.

Q. Interesting.

A. Yes.

Q. You said earlier that you guys benchmarked multiple cameras. What does benchmark mean?

A. We compared the features. That's what I meant, is that we put the -- let's say we have two, three cameras that we are comparing. We put the features side by side and analyzed to see what we are looking for for our application, which one is basically a better fit to our applications.

Q. So you benchmarked -- scratch that.

So you looked at -- you tested GoPro's cameras' performance against other cameras' performance, right?

A. I would say one thing we did, but we also looked at if one camera, for instance, missing some feature or the other one has that feature or they have similar features, we compared them. And literally compared them by experimenting on them.

Q. Is benchmarking something that's pretty typical in the industry?

MR. SCHMIDT: Objection to form.

THE WITNESS: Well, that's a general question. I don't know if it's a typical thing to do in industry or not. But what I was saying is that we compared those cameras -- we wanted to find a camera that best fit our application. So we compared multiple cameras before deciding which camera we want to use.

BY MS. MAO:

Q. When you are testing a -- a product's performance, you know, so-called benchmarking, do you think that's -- that's -- that constitutes copying of that product's technology?

A. I have not opined on that in my declarations. So, I don't know. Your question is a general question. I can tell you, you asked me what we did. We compared cameras and we tried to find which camera best fits our application.

Q. I'm just asking you, if you're just comparing different cameras, does that mean copying?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, if you are copying the -- I mean, if you're copying something, then it's not benchmarking. If you're copying something, it means that you look at another product and say, okay, how do they do this. And by "copying," I don't mean that you have necessarily access to proprietary information. No, you could copy also by looking at the product and analyzing the product and saying that, okay, I would like to reproduce same features. That's what I call copying.

But we were not in this project copying anything. We were looking for -- we were not producing any cameras here or trying to compete with any one of the

camera companies. We were just -- we were not competitors with these camera companies, so we were just looking at comparing these cameras.

BY MS. MAO:

Q. Understood.

And you said the project is to reconstruct 3D models?

A. That's correct. So, I mean, what the owner of the company had in mind -- as I said, he was an ex-Navy pilot --

Q. Yeah.

A. -- and what he had in mind to create a virtual view capable of visualizing in all directions a panoramic view of the -- of his entire environment of the -- he wanted to be able to create that scenario, and on top of that, a 3D -- if not a true 3D model but, you know, at least the impression of 3D.

Q. And how -- how were you guys able to create that 3D effect? What's the input?

A. Well, the input is multiple images. There are many ways you can do 3D reconstruction, but the input in this case were many images, in fact, video -- video data. But video data --

(Reporter clarification.)

THE WITNESS: So if you remember, I told you that we had multiple cameras. So they each provided video streams and they were synchronized. If you remember, I said we networked them. They were synchronized. So one method, for instance, in computer vision to create 3D model is stereovision. So multiple -- stereo --

BY MS. MAO:

Q. Stereo?

A. Stereovision.

Q. How do you -- how do you spell it?

A. S- -- S-T-E-R-E-O. Stereo.

Q. Oh, okay.

A. Stereovision, like we have two eyes, that allows us to have depth perception. And that's one way we used to create 3D models of the environment of the airplane.

Q. Wait. How do you get depth? How do you get the stereovision?

A. Well, this is a long -- I take a whole semester to teach my students how to do this.

Q. There is a good opportunity for me to nerd out. I was a computer science major.

A. Oh.

Q. So this is a good opportunity for me to nerd out.

A. Okay. So there are many steps involved. So if you have two views, there is a -- there's a phenomenon that's called "parallax effect" between the two views. That parallax effect is depth dependent. And I'm just trying to make it in a nutshell to describe it. That parallax effect gives what is called "disparity," provides disparity, tells us -- you know, in simple terms, it tells me, you know, each pixel has moved by certain amount by -- and by how much, and that is depth dependent.

So just to give you an idea, if you are -- I sometimes use this for my students to understand, is that if you're sitting in a car, you know, maybe your parents are driving, you look outside, you see that objects that are close to the car move very fast, objects that are farther move slower, and if an object is very far away, it stays with you for a long time before it gets out of your field of view. And this is because the motion of -- the motion of the -- let's call it, in the digital case, pixels. In our case, it's not

pixels. But motion of the points in our field of view, in our vision system, depends on how far away the object is from our view.

And of course, there are other factors that come in play, like, you know, the degrees of freedom of the camera and so on and so forth. There are non-linearities because a typical camera doesn't have to be linear. There are many other factors that come into play.

But to simplify it, it really is that, you know, depth affects how fast an object moves in front of your field of view, but because we have two views, stereovision is -- simultaneously allows me to see that motion. And that gives me a depth perception.

Q. So, when you were calculating the depth, you were looking at how fast the pixel moved between frames?

A. You can -- the better way of describing it, for each pixel, we found that parallax effect or disparity, we calculated disparity, and you need to take additional steps like camera calibration and so on and so forth. In this case, we have multiple cameras. They are a lot more involved, you know, synchronization and so

on and so forth.

But more or less, you're right in the sense that you look at how much each pixel is moving plus additional information that you have, you convert that into depth information.

Q. So in order to have the depth information, you -- you don't need -- okay. Scratch that. Let me try to understand what you're saying.

And so base- -- so once you have the depth information, that allows you to construct a 3D effect, right?

A. Right. Of course, the company was looking beyond just doing 3D reconstruction. They wanted to actually, once they had done 3D reconstruction, map back pixel values, I mean the color values, on top of that 3D representation, and they wanted to be able to visualize that. So there was a whole -- there are whole other aspects in that project beyond just 3D reconstruction.

Q. And I think earlier you said it was not a complete 3D model or something?

A. Yeah, so not exactly that. I said there are basically different ways you can represent 3D, and one is actually you build real,

true 3D model inside your computer, you have -- for every point in space, you have the xyz coordinates. That's -- that's a full 3D model, of course, in some coordinate system. So you establish your coordinate system. In that coordinate system, you have the xyz coordinates of a point in space.

That's a full 3D model, but there are other ways of representing for visualization purposes. That's what I mean. There are other ways of representing 3D so that it gives you the perception of depth but you don't necessarily have to work -- work all the way to exact 3D points. But that's still 3D. Don't get me wrong. It is still 3D.

Q. So in your projects, how did you represent the 3D effect?

A. We represented it with a full 3D model, but we were looking at alternatives. This is a visualization aspect of it you're talking about. So when I say -- when I said that I don't know what your question was exactly how you termed it, when I -- I was talking about the visualization, that there are many ways of visualizing 3D information. So one way is to actually on your -- you could be visualizing, for

instance, on a screen of your -- on your computer, you could be visualizing projection of those xyz coordinates back in your 2D display, for instance.

Q. But then if I'm looking at my screen, it's 2D, not 3D?

A. That's right. So that's what I was talking about visualization. So we were looking at alternatives. For instance, like we were looking at different types of technologies that are there for visualization exactly in 3D. I'm talking about goggles.

Q. Oh.

A. I'm talking about, you know, head-mounted displays.

So in one display is 2D. You're right. But if you have two displays associated with each eye, then you can get 3D perception out of that.

Q. Can you explain more about that?

A. Sure. So, basically, your -- your brain is processing each visual information provided and combines them in your, you know -- and create the perception of 3D. So that's one way of visualization.

We looked at just simple also -- you

might know, back decades ago we had -- for instance, you could go to movie theaters and have 3D by just through having different types of filters on each -- on each eye. You know, red and blue would create a depth perception.

So we looked at multiple options. We even looked at -- I mean, you mentioned that your screen is 2D, but there are 3D screens. And I'm not sure if you're familiar, basically --

Q. No.

A. Okay. The way -- those technologies are out there, and we actually purchased some of those technologies and used them. So each pixel in your -- on your screen is not pointing -- they're not all pointing in the same direction. So they're -- they create two sets of pixels on your screen, some more pointing -- if you locate yourself correctly in some region in front of the 2D -- apparently 2D display, some pixels point in one direction of -- in one -- towards one eye, and other pixels point to a different eye, to the other eye, and by just staying within, certainly, a visual point of view, you always see things in 3D. So, that's another alternative that we were looking at.

Q. Interesting.

Were you ever looking at the motion of the camera or the motion of the airplane that carries the camera?

A. Yes, I mean, that was one of the reasons that we -- we actually zeroed in on GoPro cameras because they were capable of handling -- as I said, we were mounting on an -- what I call an agile platform, like an aircraft that could maneuver in 3D space in different directions, different speeds, and so on and so forth, maybe accelerate, angular acceleration, angular velocity and all these aspects that -- the camera being capable of handling all of these.

Q. What do you mean, the camera being able to handle all of these?

A. Well, so, for instance, if you take your cell phone, you cannot do that because your cell phone does not have the technology incorporated in it to -- it's designed to handle situations where you have a handheld camera with maybe slight motions of your hands or -- it's not designed to do that. I'm talking about specialized camera that could handle the type of motion I just told you. You know, an aircraft could be rotating

and accelerating on an agile platform --

Q. Sorry. Are you talking about the durability of the device or how the motion would affect the image quality?

A. No. I'm not talking about durability. I'm talking about the features in the camera that are capable of handling a motion of that sort. In other words, motion of a scenario where an object is -- has angular acceleration, angular velocity, even linear acceleration, linear velocity, that can vary from one point in time to another point in time very quickly or even maybe slow down and maybe the aircraft is landing, so different types of motions, basically. The camera having the features, the software features that can handle those things. I'm not talking about durability.

Q. Oh, you mean the different motion would not -- would have less of an effect on the image quality?

Is that what you're talking about?

A. You mean for this project?

Q. Yes, this project. Yeah.

A. No. I mean, I don't know -- I mean, then we have to define what is image quality. I'm not talking about image quality. I'm just saying

that -- the camera being able to have -- I mean the camera having features that can handle a scenario where an agile platform has these types of motions. You know, it can handle in the sense that it can produce images that were useful for us.

Q. Because for a phone -- some of the phones that you were looking at, the image quality wouldn't be good?

A. Actually, I said phone here. I don't believe we looked at phones. I don't remember looking -- we didn't even consider phones. Because, I mean, you know -- I guess we might say if a POSITA -- as a POSITA, let's say, at the time, I wouldn't think that the phone was -- would be capable of handling a scenario like that. So we were looking at professional cameras that were designed to, you know, handle situations that -- as I mentioned, that we were looking at.

MS. MAO: Okay. Sorry. Can we go off the record for five minutes?

(A brief recess was taken from 10:47 a.m. to 11:02 a.m.)

BY MS. MAO:

Q. Welcome back, Dr. Foroosh.

A. Thank you.

Q. During the break, did you discuss with your counsel, Mr. Schmidt, about the substance of the deposition?

A. No.

Q. Okay. Great.

Earlier today you were talking about a peri- --

MS. MAO: Sorry. Remind me, what was --

THE REPORTER: Parallax effect.

THE WITNESS: Thank you.

MS. MAO: Yeah.

BY MS. MAO:

Q. Could you -- could you please spell that, please?

A. I think it's P-A-R-A- -- but I don't remember if it's double L -- it's probably double L, -A-X or might be -L-A-X. I don't remember the correct spelling. Sorry.

Q. And what is the -- how do you pronounce it?

A. Parallax effect.

Q. What is the parallax effect?

A. So as I was describing earlier, if you have two cameras, two views of the same scene with

overlapping field of view, then corresponding pixels are shifted from one view to the other one, that's depth dependent. That's called "parallax effect."

Q. So based on the 2D pixel information, you can get depth information.

A. You have to go through some process of reconstruction, 3D reconstruction. You need multiple views, multiple images, and go through a reconstruction process.

Q. Understood.

And earlier you said you chose GoPro cameras because they were able to handle different motions better, correct?

A. Yes.

Q. And so, when you were using the GoPro cameras, was GoPro cameras' video stabilization feature utilized?

A. I believe so. To my best recollection, we did, yes.

Q. Have you done other research using GoPro cameras?

A. Not to the best of my recollection.

Q. Besides this research project, have you used GoPro cameras for anything else?

A. I have some GoPro cameras in my lab, but I think we have not been using them for any other projects. I don't remember using them for other projects. But as you can see, as I mentioned the Florida High Tech Corridor was additional funding that was coming from the State of Florida matching -- that was a matching fund to Jackson Technologies' funding. That's not a separate project, but if you look at them as two different projects based on two different fundings, yes, then I used them both in Jackson Technology [sic] and FHTC funding.

Q. I think later you said you received funding from Electronic Arts and the goal of the project was to develop algorithms using cameras similar to GoPro systems.

Do you see that?

A. Can you point me which?

Q. Yes. It's on page 5.

A. Of which?

Q. Of Exhibit 2018.

A. Yeah.

Q. In the 1186 proceeding.

A. Yeah. I see that on the same page. Now I remember the project.

Q. What cameras did you use there?

A. I don't remember. I don't remember what cameras we used there. Not all the cameras were moving cameras in this case. But we did work both on body-mounted cameras and -- and stationary cameras looking at people who were doing some actions. But off the top of my head, I don't remember which cameras we used.

Q. But you used cameras similar to GoPro's, right?

A. I think the -- again, this is long ago, but I believe that we used cameras that -- that we used different types of cameras, ones that were stationary looking at people or person doing actions, and the bodycam cameras, I -- that's what I mean, the body-mounted cameras might have been similar. But I don't remember what cameras, which cameras. It's too long ago. I think this dates back before -- yes, it's a 2008, 2009. I don't remember which cameras we used.

Q. Got it. I'm just trying to understand what you mean by "cameras similar to GoPro's."

A. What I meant was that they were body-mounted cameras, so therefore, there was some motion in there. Maybe not as agile a motion as an

aircraft, but still, person is a moving object, a moving person.

Q. And how does that relate to GoPro's cameras?

A. I don't think I said that it relates to GoPro's cameras. I said that we used cameras -- you know, it says here "using body-worn cameras similar to GoPro systems." It's just that the fact that its application was for a moving platform; in that sense, similar.

Q. Oh, I see.

So like a GoPro's camera's used for moving objects. That's what you meant?

A. A moving plat- -- mounted -- you know, like the other project, the Jackson Technologies project, it was a moving platform, we had mounted cameras. As I said, a human, a person is a moving platform in that sense.

Q. Understood.

Have you used GoPro's cameras outside of work?

A. No.

Q. Do you have a smartphone?

A. I do.

Q. Have you ever used a smartphone's

video stabilization feature?

A. I might have. I don't remember.

Q. So if I'm -- I ask you, do you know if there are any differences between a smartphone's video stabilization feature and a -- and a GoPro camera's video stabilization feature, do you have any opinion on that?

MR. SCHMIDT: Objection to form.

THE WITNESS: Did I offer an opinion on that? Did I -- if so, please point me and we can discuss it.

BY MS. MAO:

Q. No. I'm just saying, do you -- if I'm just asking you, based on your own experience, is there any differences between a GoPro camera's and a smartphone's video stabilization feature.

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, same answer. I don't know whether -- I don't believe I have opined on that or I might have, you know, in the context of some prior arts. And, yeah, please show me where in my declarations, any one of the three declarations, I have...

BY MS. MAO:

Q. I'm not sure if you opined on that. I'm just asking you if you have an opinion on that.

A. Well, I -- I would not like to, outside my declarations, offer opinion on differences between different cameras because I think, you know, I'd rather stay with whatever subject I have rendered opinion on in my declaration.

Q. Have you personally compared a smartphone's video stabilization feature and a GoPro camera's video stabilization feature?

A. Again, is there something that I'm discussing in my declarations? I would be more than glad to have a look at it in my declarations.

Q. I don't think in your declarations you talked about you personally comparing a smart phone's and GoPro camera's video stabilization feature.

A. As I said, I have not used GoPro cameras in my daily usage, so I've used GoPro cameras professionally as a, you know, researcher under certain projects. So I don't remember off the top of my head, but I don't think I sat and made comparisons between a cell phone and/or -- any cell phones and a GoPro camera personally. You

said, did I do it personally? The fact that I -- I haven't -- I don't -- I have not used GoPro cameras in my daily life, outside professional projects, so I don't believe so, that I compared or not. So I don't think so.

Q. So you don't have any opinion on how -- you don't have any opinion on the differences, if any, of the stabilization features of a GoPro camera compared to a smartphone's, correct?

MR. SCHMIDT: Object to form.

THE WITNESS: That's not what I said. I just said I don't have any opinion and I might have expressed opinions in the context of some prior arts here in my declarations. You asked me if personally, I have personally gone to compare, and I said, no, I have not personally, because in my -- I don't remember ever using GoPro cameras for any personal applications, you know.

I have always used GoPro cameras -- in fact, I used GoPro's cameras between those dates, 2012-2018. Those are the times where I used GoPro's cameras in a -- under

a project. So, at the time we compared GoPro cameras with other similar cameras, I don't remember which cameras off the top of my head, but those are comparisons we did.

BY MS. MAO:

Q. Okay. But do you have any opinion as to, you know, if there are any differences between a GoPro camera's video stabilization feature and a smartphone's video stabilization feature?

MR. SCHMIDT: Objection to form.

THE WITNESS: Again, I don't believe I have expressed any opinion on that in my declarations in terms of the video stabilization, or if I have, please point me to the location where I have expressed any opinion.

But your -- is your question about personally comparing? I mean, earlier you said: Have you personally compared them? And I said, no, not in my personal daily life, I have done -- I have not done such comparisons, and -- because I have not used GoPro cameras in my daily life. I do have GoPro cameras in my lab. We used it under some projects.

BY MS. MAO:

Q. Have you done any research about video stabilization?

MR. SCHMIDT: Objection to form.

THE WITNESS: I have done my research in many areas of image processing, computer vision. You have my CV. If you point to a particular work, I can discuss it. You know, almost 30 years of career, I have done so much. I -- you know, you're asking a general question there, have I done anything with video -- did you say "video stabilization"?

BY MS. MAO:

Q. Correct.

A. So you have my CV. I mean, we can go through that, you know, one by one, papers published and projects.

Q. But you cannot remember off the top of your head any research on video stabilization?

A. I'm sure I might have done related work, or -- but as I said, I don't remember off the top of my head a particular project or particular publication related to video stabilization.

Q. Let's talk about the 1164 proceeding

first, and that relates to the '840 patent.

A. Yes.

Q. You submitted two declarations in the 1164 proceeding, right?

A. Yes.

Q. Did you review those two declarations in preparation for today's deposition?

A. I mostly focused on supplemental declaration for today's deposition.

Q. Do you have any corrections to your opinions expressed in the supplemental declaration which I take is Exhibit 2018, the declaration in support of the patent owner response?

A. No.

Q. Do you have any corrections to your earlier declaration which is Exhibit 2001?

A. No.

Q. Do those two declarations include the entirety of your opinions regarding the 1164 proceeding?

A. They do, but my supplemental declaration basically was defining my opinion of my original declaration.

Q. But you don't have any corrections to your original declaration, right?

A. That's correct. That's what I answered earlier. I said no.

Q. So you don't have any opinions not identified in those two declarations, right?

A. Can you rephrase your question?

Q. Yeah.

A. I'm not sure if I understand your question.

Q. Of course, of course, of course.

So, if it's not written or stated in either of those two declarations, then you don't have an opinion on whatever is missing from those two declarations, right?

A. That's correct. My opinion is in -- my -- all my opinions are included in these two declarations.

Q. Great. Thank you.

Let's talk about IPR Proceeding 1165. Again, you submitted two declarations in this proceeding, right?

A. Correct.

Q. And just for clarity of the record, that is Exhibit 2001, which is your declaration in support of the patent owner preliminary response, and also Exhibit 2018, which is your declaration in

support of the patent owner response, correct?

A. Correct.

Q. Did you review those two documents in preparation for today's deposition?

A. Again, in this case also, I mostly focused on my supplemental declaration, Exhibit 2018.

Q. Do you have any corrections to either declaration?

A. I don't.

Q. And again, those two declarations include the entirety of your opinions regarding Proceeding 1165, right?

A. Correct. But as I said, in my supplemental declaration, I refined my opinion that was in the -- my opinions in the -- in my original declaration.

Q. And let's talk about the last proceeding, 1186, and that concerns the '894 patent. Again, for clarity of the record, you submitted two declarations in this proceeding. One is Exhibit 2001, your declaration in support of patent owner preliminary response, and the other one is Exhibit 2018, your declaration in support of patent owner response, correct?

A. Correct.

Q. Did you review those two declarations in preparation for today's deposition?

A. Same as the other IPRs. I mostly focused on my supplemental declaration, Exhibit 2018.

Q. Do you have any corrections to either declaration?

A. I don't.

Q. And those two declarations include the entirety of your opinions regarding the 1186 proceeding, right?

A. Correct.

Q. And let's talk about all three proceedings. Are there any documents or evidence that you considered or relied upon in forming your opinions that are not referenced in your declarations?

A. I don't believe so. I -- I have relied on documents that I have referenced in my declaration.

MS. MAO: Sorry. I'm having some diffi- -- connectivity issue. Can we take a break for five minutes?

(A brief recess was taken from

11:28 a.m. to 11:35 a.m.)

BY MS. MAO:

Q. Welcome back, Dr. Foroosh.

A. Thank you.

Q. During the break, did you discuss the substance of this deposition with your counsel, Mr. Schmidt?

A. No.

Q. Did you discuss the substance of this deposition with anyone else?

A. No.

MS. MAO: I pass the witness. No further questions.

MR. SCHMIDT: I have none. We'll reserve the right to read.

MS. MAO: Order.

(The proceedings were concluded at 11:36 a.m.)

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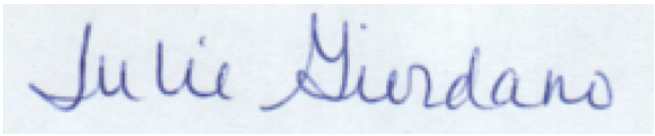
COUNTY OF ORANGE)

I, Julie Giordano, Florida Professional Reporter, do hereby certify that I was authorized to and did stenographically report the deposition of DR. HASSAN FOROOSH, that a review of the transcript was requested; and that the foregoing transcript, pages 1 through 46 is a true record of my stenographic notes.

I FURTHER CERTIFY that I am not a relative, employee, or attorney, or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

Dated this 15th day of July, 2025.



JULIE GIORDANO
Florida Professional Reporter-Certified





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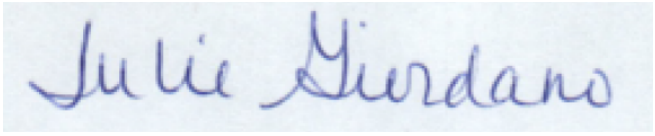
CERTIFICATE OF OATH

STATE OF FLORIDA )
) SS.
COUNTY OF ORANGE )

I, the undersigned authority, certify that DR. HASSAN FOROOSH personally appeared before me and was duly sworn.

WITNESS my hand and official seal this 11th day of July, 2025.



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I declare under the penalties of perjury under the laws of the United States that the foregoing is true and correct.

This declaration is executed this _____ day of _____, 20___, at _____, _____.

_____

DR. HASSAN FOROOSH

PATRICK SCHMIDT, ESQ.

patrickschmidt@quinnemanuel.com

July 15, 2025

RE: Arashi Vision (U.S.) LLC v. Gopro, Inc.

7/11/2025, Dr. Hassan Foroosh, (#7415129).

The above-referenced transcript has been completed by Veritext Legal Solutions and review of the transcript is being handled as follows:

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

Arashi Vision (U.S.) LLC v. Gopro, Inc.

Dr. Hassan Foroosh (#7415129)

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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