

Rosenblatt Age of AI Scaling Conference – Ziad Asghar

00:14:26.760 --> 00:14:38.100

Kevin Cassidy: Okay, good afternoon everyone thanks for joining us this afternoon for the rosenblatt age of Ai scaling conference we're fortunate to have Ziad ask our.

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00:14:39.360 --> 00:14:50.190

Kevin Cassidy: Call comes Vice President of product management and also mauricio Lopez quite in and welcomes Vice President of.

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00:14:50.730 --> 00:14:58.650

Kevin Cassidy: Investor relations are with us today, as I had will be presenting today he leads the snapdragon roadmap planning and application processor.

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00:14:59.070 --> 00:15:08.670

Kevin Cassidy: technologies, and this is covering all smartphone platform products, as I had drives the definition of products, ensuring that the.

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00:15:09.300 --> 00:15:18.990

Kevin Cassidy: qualcomm products leave in technology and best in class user experiences as well, making the trade offs between features power performance and cost.

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00:15:19.980 --> 00:15:33.120

Kevin Cassidy: He leads application processor technologies, including artificial intelligence camera graphics cpu audio video and security, you know quite a few features, he works on he.

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00:15:34.080 --> 00:15:43.170

Kevin Cassidy: has more than 20 years experience in the wireless semiconductor industry and health has held a broad set of leadership positions from R amp D to product management.

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00:15:44.880 --> 00:16:03.150

Kevin Cassidy: Everyone is well aware of outcomes 5g leadership and we've asked, as I have to discuss how qualcomm's Ai development along with the five g is changing the industry and expanding qualcomm's markets well beyond smartphones so with that i'll hand it over to zach Thank you.

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00:16:04.320 --> 00:16:06.540

Ziad Asghar: Thank you, thank you for having me.

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00:16:07.650 --> 00:16:18.120

Ziad Asghar: yeah i'd like to kind of give you guys an overview of did is a amazing amount of excitement from qualcomm perspective and really from an industry perspective with Ai.

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00:16:19.140 --> 00:16:28.500

Ziad Asghar: The cool thing about Ai or the amazing thing at least from a technology perspective continues to be that every use case that we have on an end products we feel becomes better.

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00:16:29.010 --> 00:16:38.610

Ziad Asghar: It becomes a lot more capable, it becomes enhanced in many ways, and then it opens up completely new opportunities for our product lines that are not possible in the past.

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00:16:39.540 --> 00:16:43.770

Ziad Asghar: So, if you look at it and take any example, if you take the example of smartphone, for example.

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00:16:44.280 --> 00:16:53.160

Ziad Asghar: We think with artificial intelligence, we really gave it the ability to be able to really understand what is happening around it, to be able to comprehend.

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00:16:54.060 --> 00:17:02.700

Ziad Asghar: and absorb the information the stimuli around it and actually be able to perceive and then reason based on that data and actually be able to act on it too.

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00:17:03.480 --> 00:17:12.720

Ziad Asghar: So just some examples that come to mind are the ability for the smartphone now to be able to completely take what we have.

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00:17:13.290 --> 00:17:22.830

Ziad Asghar: You know, in front of it, and now, to be able to make sense of it so in the past, our smartphones or connected cameras or other devices that we work on would absorb this light.

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00:17:23.280 --> 00:17:32.580

Ziad Asghar: But they would never know what that light means Well, now we have this amazing ability that the smartphone camera can actually comprehend and understand what it's looking at.

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00:17:33.210 --> 00:17:43.260

Ziad Asghar: And that completely changes and opens up so many other avenues right with this, you have the ability, for example, to take the example of security camera well, you can now.

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00:17:44.220 --> 00:17:50.520

Ziad Asghar: You know, know what is in front of the security camera I mean i'll take an example, I have a security camera at home it's not as smart.

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00:17:51.000 --> 00:17:59.580

Ziad Asghar: And it basically sends me an alert every time somebody passes by well with the application of Ai, not only are you able to determine if it is.

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00:18:00.030 --> 00:18:08.910

Ziad Asghar: You know whether it's a smartphone or or if it's a safe person or if it's a car it's also able to actually determine the face and recognize the face and say.

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00:18:09.240 --> 00:18:14.670

Ziad Asghar: Well, this is a person that lives in this household or not, and be able to make those kinds of decisions that it's.

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00:18:15.000 --> 00:18:25.800

Ziad Asghar: possibly even able to give you access to the home, depending on whether you determine if somebody is a safe person or not so that's just one example of how Ai is really opening up a lot of opportunities for us.

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00:18:27.930 --> 00:18:40.440

Ziad Asghar: We of course look at Ai as something that not just touches the end case or and use cases, but it also touches and improves all the different technologies within the product.

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00:18:41.190 --> 00:18:48.720

Ziad Asghar: What I mean by that is it improves, for example, the camera improve the security aspect, it improves the gaming aspects, it includes.

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00:18:49.110 --> 00:18:57.600

Ziad Asghar: You know, it improves audio speech so anything that you can sense and touch, we can market, improve those use cases in a very, very big way.

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00:18:58.440 --> 00:19:03.240

Ziad Asghar: By the application of Ai we've been working on Ai technology for more than a decade.

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00:19:03.840 --> 00:19:14.010

Ziad Asghar: So we started our research and our corporate r&d division more than more than 10 years ago, since then we've done various acquisitions, will continue to invest in it, because we always looked at this.

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00:19:14.490 --> 00:19:20.820

Ziad Asghar: As this horizontal horizontal enabling technology that makes our products and technologies much, much better.

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00:19:21.540 --> 00:19:31.770

Ziad Asghar: So we are applying it to those technologies, we are also applying it to the way we actually develop our silicon products, so the actual product process of actually improving.

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00:19:32.640 --> 00:19:45.000

Ziad Asghar: The way we put together or I sees integrated circuits, is something that you're actually applying Ai to also so lots of different levels at which we actually see here being applied to our products.

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00:19:47.190 --> 00:19:58.230

Ziad Asghar: You know, we have what we have been really focused on that call come is the amazing ability to be able to do more processing at the lowest power possible.

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00:19:58.980 --> 00:20:04.350

Ziad Asghar: Which means that we are actually able to process technology, we are actually able to do it.

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00:20:05.100 --> 00:20:13.110

Ziad Asghar: at much lower power than anybody else that advantage actually which we have learned, which has been our pedigree which has no DNA for the longest time.

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00:20:13.500 --> 00:20:23.640

Ziad Asghar: From a smartphone product perspective is actually now taking us into many new markets that we are starting to enter, for example, automotive, for example, xr, for example.

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00:20:24.480 --> 00:20:35.850

Ziad Asghar: cloud API all of those markets when you apply this unique advantage that polycom brings to them, it really sets us apart, compared to many of the other vendors that are out there.

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00:20:36.480 --> 00:20:47.040

Ziad Asghar: In addition to that, we of course working on a full stack software hardware and all the different parts, such that we are able to develop and create these differentiated products that.

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00:20:49.350 --> 00:20:59.460

Ziad Asghar: I can spend some time talking about the applications within smartphone and just to be clear Kevin how much time do I have so i'm not taking longer or lesser than what would the time that I have.

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00:21:00.210 --> 00:21:10.770

Kevin Cassidy: wow well the session goes up for 45 140 factor time and you know we're gonna let you speak to get your point across and then we'll open up for questions but.

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00:21:10.950 --> 00:21:14.850

Kevin Cassidy: Show feel free to you know, make sure you get your point across.

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00:21:15.150 --> 00:21:22.920

Ziad Asghar: sounds good sounds good alright so basically I go by kind of the overarching picture that we have in our minds from an API perspective.

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00:21:23.520 --> 00:21:28.740

Ziad Asghar: So, as you know, 5g something that we just launched variable differentiated from a privacy perspective.

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00:21:29.490 --> 00:21:34.560

Ziad Asghar: The we're looking at is the five g, and he is our kind of symbiotic technologies at this point in time.

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00:21:35.160 --> 00:21:41.190

Ziad Asghar: Which means 5g makes the I vector and Ai makes it better What do I mean by that what I mean by that is that.

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00:21:41.640 --> 00:21:49.350

Ziad Asghar: Imagine that you have multiple different devices your smartphone your car your smartwatch all of them that have certain degree of Ai in it.

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00:21:49.980 --> 00:21:56.280

Ziad Asghar: With the advent of 5g you have a technology that's very, very high throughput and at the same time very low latency.

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00:21:56.760 --> 00:22:12.690

Ziad Asghar: And what that allows you to do is to be able to now access the intelligence that spread out all over the network to be able to you know get access to that because of the low latency of it, so now you have get into a paradigm, which is a paradigm of you know just.

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00:22:14.250 --> 00:22:20.820

Ziad Asghar: Completely Ai that's permeating through the whole network, which is a very big differentiation for us because of it.

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00:22:21.510 --> 00:22:28.920

Ziad Asghar: The other point i'd like to make as the device continues to be the right place to be able to do a lot of a process, what is the reason for that.

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00:22:29.340 --> 00:22:37.500

Ziad Asghar: Well, we have heard a lot about privacy issues and all well as we're putting more and more Ai on the device you're actually able to do that processing on the device.

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00:22:37.920 --> 00:22:48.000

Ziad Asghar: And for those aspects, the don't concern privacy, you know we can leverage the distributed intelligence concept to be able to go beyond the device to be able to tap in to more intelligence than that.

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00:22:49.470 --> 00:22:56.850

Ziad Asghar: So that's kind of the grand vision we think we are making very good progress on it, we have products that are attached to all of those different.

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00:22:57.630 --> 00:23:07.440

Ziad Asghar: Parts of the distributed intelligence network that I talked about, but I think the part that I really want to convey to you guys is because of the scale of qualcomm because the fact that we have.

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00:23:07.920 --> 00:23:17.910

Ziad Asghar: These you know millions and hundreds of millions of devices that we ship the Ai that qualcomm can enable is much more available to everyone.

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00:23:18.570 --> 00:23:32.940

Ziad Asghar: And really the smartphone is absolutely the best platform for doing Ai well because it has all these sensors that are able to see they're able to hear they're able to perceive the presence of a person, and then we can work on Ai On top of that.

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00:23:33.660 --> 00:23:42.180

Ziad Asghar: So let me, maybe spend a little time talking about what have we done already, if you're using a smartphone from qualcomm you're already using Ai technology.

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00:23:43.230 --> 00:23:49.560

Ziad Asghar: So one great example where we started applying it was on audio and speech, so what you can do is essentially.

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00:23:49.980 --> 00:23:59.670

Ziad Asghar: apply Ai to be able to get the the signal or get the voice out of the most noisiest of rooms, with the application of here.

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00:24:00.150 --> 00:24:06.120

Ziad Asghar: You can look into the darkest of rooms, with your camera and be able to take a picture again the application of Ai.

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00:24:06.540 --> 00:24:11.640

Ziad Asghar: But as we're going forward what we're able to do is that within a given frame as you're looking at me right now.

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00:24:11.970 --> 00:24:21.270

Ziad Asghar: You can actually distinguish whether there is a certain part that's the skin or here or cloth and then based on that we can process each of those segments within that frame.

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00:24:21.720 --> 00:24:37.080

Ziad Asghar: In a way that makes the picture and image quality far better than we were able to do in the past and now what you can see is that we then extend this idea into video, so the processing that you would have done at one frame level now you do 30 or 60 frames per second.

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00:24:38.130 --> 00:24:47.340

Ziad Asghar: And that allows you to create these new experiences that i'm talking about at the same time, what you can do is, as we go further out in time and we talked about.

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00:24:47.880 --> 00:24:58.980

Ziad Asghar: virtual reality and augmented reality devices Ai actually enables a lot of those use cases, because as you're looking at the world through that's a pair of glasses and you're augmenting certain things.

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00:24:59.580 --> 00:25:08.250

Ziad Asghar: That you're looking at well with Ai you would have to be able to figure out what exactly you're looking at, you have to do things like plain detection, or, to be able to.

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00:25:08.700 --> 00:25:17.100

Ziad Asghar: Clearly, and accurately do what we call tracking the position of your hands, because if you are in a world where you're interacting with the world around you by touching things.

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00:25:17.430 --> 00:25:31.320

Ziad Asghar: But you need to know what the position of your hand is another part that Ai technology enables you to do so not only is it enhancing the product lines and businesses that we have it's actually enabling the newer and upcoming businesses that we are focused on development.

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00:25:32.430 --> 00:25:40.980

Ziad Asghar: So really a very, very powerful technology horizontal technology that allows us to do all of those things, and then to extend that further.

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00:25:42.030 --> 00:25:52.890

Ziad Asghar: As you go from Idi or Infotainment on the automotive market and you move into you know Ada where you are doing driver Assist systems and then into autonomy.

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00:25:53.520 --> 00:26:04.260

Ziad Asghar: These application this core r&d the score investment that we have done from the perspective of mobile, we now have this unique ability to be able to take a lot of that learning.

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00:26:04.740 --> 00:26:11.760

Ziad Asghar: apply to those market and that allows us and gives us a very good running start in a lot of those markets to really be able to.

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00:26:12.630 --> 00:26:25.830

Ziad Asghar: make progress very, very quickly, because many of the problems they are analogous or similar to what we have already sold sold on the mobile side so again a very unique advantage that polycom is able to to bring.

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00:26:27.240 --> 00:26:32.100

Ziad Asghar: From the actual architecture, or from the actual technology enablement perspective.

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00:26:32.640 --> 00:26:41.790



Ziad Asghar: We focus on developing, as you know, in the smartphone space we do accelerators we do an accelerator for audio video editor for videos because that is how you get the power.

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00:26:42.090 --> 00:26:47.730

Ziad Asghar: To the right point that's how you make a device that people use so extensively last the whole day.

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00:26:48.390 --> 00:26:57.900

Ziad Asghar: So that's exactly what we're trying to do, and taking that pedigree that advantage into these new spaces, which means we can do number one, a lot of Ai processing.

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00:26:58.320 --> 00:27:05.940

Ziad Asghar: But the unique advantage with polycom we can do that processing at the lowest power possible So what we have done is, we have created this engine.

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00:27:06.390 --> 00:27:21.690

Ziad Asghar: That we call over artificial intelligence engine and that constitutes an accelerator that basically have what you can call scalable vector and tensor processors and if you go into the detail of that it basically maps to an exact neural network.

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00:27:22.830 --> 00:27:30.570

Ziad Asghar: Which is exactly how you should design that not only have we designed it it's already into products, our last smartphone products, to give you an idea.

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00:27:31.080 --> 00:27:37.830

Ziad Asghar: had about 26 trillion operations per second capability, we just enhanced it, and now it can basically.

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00:27:38.700 --> 00:27:53.430

Ziad Asghar: process 32 trillion operations per second that's a massive amount of Ai processing capability at an extremely low power and that's really the advantage that we are able to take into robotics into all other areas that we are talking about.

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00:27:54.660 --> 00:28:03.990

Ziad Asghar: At the same time we develop a full software stack that goes with those with Ai, as you know, one of the big challenges of Ai is to be able to do software that's able to scale.

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00:28:04.410 --> 00:28:13.320

Ziad Asghar: And that's exactly what we have done, we have a software that's basically gives you access at a very high level we support all the frameworks like tensorflow pi torch.

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00:28:13.740 --> 00:28:24.060

Ziad Asghar: But at the same time, we have a snapdragon neural processing SDK at the highest level which abstracts a lot of the details allows our partners to be able to very quickly, you know.

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00:28:24.600 --> 00:28:36.690

Ziad Asghar: start to use Ai on our devices, but for those partners who are more capable we actually give them access at a lower level as well, much closer to the hardware, so they can get a lot more out of their products.

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00:28:37.260 --> 00:28:47.010

Ziad Asghar: So again, software that's very well differentiated and is able to access multiple different levels of performance so that's kind of the the software stack.

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00:28:47.640 --> 00:28:56.550

Ziad Asghar: And then, overall, the way I continue to look at the space as we go into there are so many new areas that this is opening up for us, so one of the.

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00:28:56.940 --> 00:29:06.510

Ziad Asghar: Areas that we have talked about is things like smart retail or things like Smart Cities even because if you just look around and many of you who might have traveled around in China.

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00:29:07.050 --> 00:29:12.780

Ziad Asghar: The sheer number of cameras that are out there at any given intersection here or in many countries of the world.

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00:29:13.350 --> 00:29:21.600

Ziad Asghar: It is quite impossible for a person to be sitting there and processing all of that information right, but what you can do with products like what wacom is offering.

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00:29:22.050 --> 00:29:28.470

Ziad Asghar: You can actually have an ability to be able to look at that video stream make sense and determine if an event has happened.

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00:29:28.950 --> 00:29:40.290

Ziad Asghar: For example, you're able to tell if two cars have come very close to each other, signifying that an accident might have happened and then an alert can be raised so just the the unique ability.

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00:29:40.680 --> 00:29:52.890

Ziad Asghar: of Ai coupled with qualcomm strengths of super conductivity and low power is opening up avenues and use cases that are otherwise not possibility.

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00:29:54.300 --> 00:30:01.380

Ziad Asghar: And maybe one of the key things to add is I talked earlier about, as you know, our leading 5g modern technology.

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00:30:02.250 --> 00:30:07.440

Ziad Asghar: But the key part is as he applied here, even to modern technology, what you are able to do is to.

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00:30:07.890 --> 00:30:17.580

Ziad Asghar: access and to be able to get the signal information in the most complex of channels conditions where others would not be able to so we're actually applying Ai to all these technologies.

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00:30:18.090 --> 00:30:26.370

Ziad Asghar: Giving a very unique advantage to qualcomm across the board, and you know i'll take maybe a little bit of time, also on the PC market.

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00:30:27.360 --> 00:30:36.720

Ziad Asghar: So PC market is really something that's right for the application of the I mean i'm sure many of you see this on a daily basis, how many times do we type something and say well let's meet up.

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00:30:37.350 --> 00:30:46.200

Ziad Asghar: To discuss this, you know with Ai processing those meetings can be created automatically where we are processing, you know things like being able to.

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00:30:46.560 --> 00:30:57.600

Ziad Asghar: You know summarize a long email, to be able to do natural language processing all of those things can be done, uniquely and can be done at very, very low power in the case of contact.

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00:30:59.040 --> 00:31:10.440

Ziad Asghar: And maybe the other aspect which gives me, you know the good feelings which is basically Ai for good, I think there are applications of Ai which have already worked on this call come.

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00:31:11.220 --> 00:31:16.830

Ziad Asghar: For example, we had an engagement in India, where you can actually take your smartphone and put a small lens on top of it.

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00:31:17.310 --> 00:31:22.140

Ziad Asghar: And what you can do with, that is to be able to actually look inside your eye and be able to.

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00:31:22.770 --> 00:31:31.140

Ziad Asghar: You know, diagnose conditions like a diabetic retinopathy, for example, and this might be a you know, in a location where there isn't as much.

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00:31:31.920 --> 00:31:41.700

Ziad Asghar: Healthcare available, but by some of these technologies you're actually able to diagnose or do a course diagnosis and then the time of course you can have that person.

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00:31:43.170 --> 00:31:46.920

Ziad Asghar: see an expert and then be able to make sense of it.

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00:31:47.700 --> 00:31:54.810

Ziad Asghar: So really quite a lot that we've been working on there's a long runway coming up ahead, where we combine a lot of these technologies.

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00:31:55.110 --> 00:32:07.080

Ziad Asghar: and go into a lot of new products when always make this example that I shared with you guys already on augmented reality which you can just envision what we can do with this right you walk into a country that you don't speak the language.

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00:32:08.160 --> 00:32:19.260

Ziad Asghar: augmented reality, you can pretty much take all the signs were there is any text and be able to translate that into English so as you walk around you're able to just navigate your way as you'd be able to do over here.

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00:32:20.640 --> 00:32:31.710

Ziad Asghar: You know the augmented reality, the gaming experience completely can be changed as you're doing the true glasses, for example, you can actually change the plot of the game, you can change the textures in the game.

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00:32:32.730 --> 00:32:43.560

Ziad Asghar: You can really do some pretty amazing things that I think make the experiences for consumers and for industry significantly better than what is available today.

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00:32:44.640 --> 00:32:52.020

Ziad Asghar: The metric that I think we should be really focused on from an API perspective is something that we cover across the board it's basically looking at.

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00:32:52.500 --> 00:33:00.270

Ziad Asghar: Performance for a given out of power we call it performance per Watt and I think in that metric welcome continues to really shine.

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00:33:00.750 --> 00:33:14.460

Ziad Asghar: And that's again because of all the work that we have done in the past, we recently launched also our robotics platform game five g and Ai capable and really one of the cool things that we are quite happy about the ingenuity.

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00:33:15.480 --> 00:33:23.100

Ziad Asghar: chopper that's there on Mars actually uses qualcomm technology so something quite exciting, something that we worked on is actually sitting on another planet.

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00:33:23.640 --> 00:33:34.530

Ziad Asghar: But that's again because of the very low power an amazing amount of processing that we're able to pack into a small product i'm hoping, this is given some high level overview and.

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00:33:35.550 --> 00:33:37.650

Ziad Asghar: You know, we can probably move to some questions.

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00:33:40.170 --> 00:33:54.210

Kevin Cassidy: Thanks I yeah that's a good overview and just a few questions that have maybe just first talking about the block diagram of the snapdragon you know I went to a presentation few years ago, probably quite a few years ago, but were.

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00:33:55.290 --> 00:34:03.900

Kevin Cassidy: You know, someone from qualcomm maybe a product engineer said that that dragon as a apartment building.

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00:34:04.470 --> 00:34:22.020

Kevin Cassidy: And all the different features audios speech you know camera like you say, are all different apartments in that in the chip, where does the Ai city is it in each one of those apartments or is it one chip in another apartment that can work on all the other features.

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00:34:22.560 --> 00:34:30.270

Ziad Asghar: As a great question I think it's a good way to look at it, too, so number one within itself it's a big apartment inside that building.

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00:34:30.960 --> 00:34:40.530

Ziad Asghar: But because of its unique advantage, some of the things that I covered, there are small pieces of Ai or small pieces of Ai in other apartments also now.

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00:34:41.070 --> 00:34:46.140

Ziad Asghar: Because what you can do like I explained, you can make security better so you'd have some health and security subsystem.

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00:34:46.530 --> 00:34:58.050

Ziad Asghar: At the same time, you can leverage the very large VI apartment or a large block to be able to access it but for certain unique cases where you may need to do processing at very, very even lower power.

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00:34:58.560 --> 00:35:05.460

Ziad Asghar: You would have a very small block in a particular engine so, for example, we are able to do a lot of always on you use cases.

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00:35:06.300 --> 00:35:13.980

Ziad Asghar: And what you can do with those use cases is that even when the phone is not active it's able to actually sense and detect and inclusive thanks.

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00:35:14.430 --> 00:35:23.670

Ziad Asghar: And what we're able to do now is to bring in all the data like radio data audio data speech data location data to create a complete contextual picture, what is happening around us.

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00:35:24.120 --> 00:35:31.050

Ziad Asghar: And by doing that what you can do is now, you can enable the use cases, for example, the phone can assert and if a person is driving, for example.

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00:35:31.380 --> 00:35:38.250

Ziad Asghar: And perhaps it should not be doing certain things, while you're driving or if you hear a baby crying at a certain point, and you know late in the night.

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00:35:38.670 --> 00:35:47.850

Ziad Asghar: All those kinds of things are renaming so it's really both a rather large apartment inside the building and then smaller pieces and the other part.

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00:35:49.410 --> 00:35:57.060

Kevin Cassidy: Okay, maybe, if I can probably ask a question they can't say exactly but as an idea what what percentage increase the.

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00:35:58.440 --> 00:36:02.460

Kevin Cassidy: guess how much bigger the diagnosis, when you add a function.

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00:36:03.810 --> 00:36:06.810

Ziad Asghar: yeah I think the way you should think about it is that.

225

00:36:08.430 --> 00:36:18.420

Ziad Asghar: You need Ai to be able to do certain functions that other blocks might have been doing right, so what it allows you to do now is that actually as you put in this era capability.

226

00:36:19.050 --> 00:36:28.590

Ziad Asghar: You can actually reduce some of the other blocks area as well selectively right because there are functions that now, you can run it into this Ai block.

227

00:36:29.130 --> 00:36:38.940

Ziad Asghar: So I think if you look at it in its entirety, if we had to actually implement the same capabilities that we're doing in the Ai block which our consumers and our customers are asking us for.

228

00:36:39.600 --> 00:36:53.790

Ziad Asghar: It would be a much larger employees actually he is able to do a lot of these things in a very efficient manner, so I would think of it this way, as it is actually doing it more efficiently, then, if we use traditional approaches, just like traditional signal processing in some cases.

229

00:36:56.430 --> 00:37:10.860

Kevin Cassidy: And if anyone wants to ask a question, we have a few different ways, you can send an email that tmt at our blt COM, or you can just unmute yourself and and ask your question.

230

00:37:13.440 --> 00:37:26.850

Kevin Cassidy: So with that the you've mentioned about a PC and some of the uses for Ai and PCs and you know we we see qualcomm of having quite a bit of an opportunity with windows 11 having.

231

00:37:27.660 --> 00:37:37.530

Kevin Cassidy: You know the operating system being on the run natively on arm, can you talk about how windows 11 could change and allow you to bring in some of these features.

232

00:37:38.550 --> 00:37:47.370

Ziad Asghar: Yes, absolutely right, you can already see what snapdragon you know windows and snapdragon is able to do you don't really need to carry your charter anymore.

233

00:37:47.820 --> 00:37:57.360

Ziad Asghar: You can be conducted at any point in time, wherever you are and that's a very unique advantages, I think many of us have fiddled around with trying to find a wi fi connection at an airport many times.

234

00:37:57.840 --> 00:38:06.090

Ziad Asghar: Well, you can actually do take care of all of that, but one of the key use cases that was shown, even at the launch like this example that we have going on right now, if I look at you.

235

00:38:06.510 --> 00:38:13.140

Ziad Asghar: It seems like i'm not looking at the camera anymore, whereas, so what was shown that the launch of the product was what we call gaze correction.

236

00:38:13.530 --> 00:38:27.210

Ziad Asghar: to actually take your face and actually adjust the is such that it would seem like i'm looking at the camera, even though I might be looking at you so that's just another example of you know, especially with videoconferencing the fact that you can basically do.

237

00:38:28.260 --> 00:38:33.450

Ziad Asghar: You know, on device some of the capabilities that in the past, would have had to be.

238

00:38:34.020 --> 00:38:41.970

Ziad Asghar: You know, sent to the cloud and be done on the device, you can dictate a complete email, you can basically translate something natively on the device.

239

00:38:42.540 --> 00:38:50.250



Ziad Asghar: Completely so you don't have to send any of your information off from the device, you can do you know email generation.

240

00:38:50.670 --> 00:38:59.910

Ziad Asghar: You can do email summarization there's a lot of news is is that, coming from a productivity perspective from the perspective of audio and speech from the perspective of video conferencing.

241

00:39:00.720 --> 00:39:08.130

Ziad Asghar: All that we think with the unique advantage that outcome has we can bring very quickly to the market and we already working with our partners.

242

00:39:10.320 --> 00:39:10.680

Okay.

243

00:39:12.030 --> 00:39:12.510

Kevin Cassidy: And maybe.

244

00:39:13.650 --> 00:39:18.270

Kevin Cassidy: Along those lines to the the xr and I know Christiana on his.

245

00:39:19.320 --> 00:39:36.690

Kevin Cassidy: Mobile World Congress keynote he said watch for xr developments and they can you give us a little more hint on what you're doing with that you know augmented reality that you discussed was very interesting that you can translate signs but it'd be also nice to have translate voice.

246

00:39:38.790 --> 00:39:43.230

Kevin Cassidy: You know just some of the features, you can bring out with xr quiz.

247

00:39:43.290 --> 00:39:52.080

Ziad Asghar: I think you know today if you're actually traveling as many times, you have to move your phone, excuse me, I have a plane flying overhead.

248

00:39:52.770 --> 00:39:59.190

Ziad Asghar: But basically, you have to hold your phone to be able to do some of the augmented reality use cases it's kind of cumbersome.

249

00:39:59.640 --> 00:40:04.890

Ziad Asghar: But you can imagine that now, if you are just viewing the world through those augmented reality glasses.

250

00:40:05.430 --> 00:40:10.410

Ziad Asghar: Well, you can do actually a lot more, I mean just imagine milestone recognition for example you're walking.

251

00:40:10.680 --> 00:40:19.290

Ziad Asghar: anywhere it's able to tell you information about something it's able to show you the path for navigation it's able to bring in the data from your smartwatch, for example to show you.

252

00:40:19.980 --> 00:40:28.470

Ziad Asghar: And the cool part over there would be that you don't really you know input your data into the device by using a keyboard anymore what you do is you talk to the device.

253

00:40:28.920 --> 00:40:35.400

Ziad Asghar: So now, you need to be able to understand what the person is saying so that's a natural language processing that's what we call it from an API perspective.

254

00:40:35.880 --> 00:40:42.360

Ziad Asghar: To not just understand a word or a letter or understand a sound, but be able to comprehend what that sentence means.

255

00:40:42.810 --> 00:40:49.950

Ziad Asghar: And you can imagine that with a are you will basically talk to your device and it's able to do whatever you're looking for, or, to be able to point at something.

256

00:40:50.730 --> 00:40:58.140

Ziad Asghar: Using your hand, all of which are Ai problems or, to be able to you know take out a noise take out all the noise in a very noisy environment.

257

00:40:58.620 --> 00:41:05.010

Ziad Asghar: Again, something that's a very unique VI problem so things like image recognition things like.

258

00:41:05.520 --> 00:41:22.560

Ziad Asghar: You know speech things like audio all that are really very well aligned with augmented reality or things that would be using Ai but specifically if you look at the devices today a lot of which are virtual reality devices qualcomm products are actually you know, one of the most.

259

00:41:23.910 --> 00:41:30.330

Ziad Asghar: Used products and those products in those end products if you know just so it's really the unique advantages that we've been building.

260

00:41:30.660 --> 00:41:39.240

Ziad Asghar: For beyond which we think many of them will extend into er Of course there are challenges that we will be working on to solve, which means, if you have a fully contained device.

261

00:41:39.780 --> 00:41:47.490

Ziad Asghar: It would require a lot of power, consumption and that again like I pointed out, is one of the unique key advantages and guacamole springs.

262

00:41:47.970 --> 00:41:52.170

Ziad Asghar: So in the beginning, you should think about it, that probably would have augmented reality glasses, but they're tethered.

263

00:41:52.620 --> 00:42:00.450

Ziad Asghar: To a phone because some of the heavy lifting is happening on the phone as a device, but as time goes by, the longer term context we think.

264

00:42:00.900 --> 00:42:10.770

Ziad Asghar: It would become a unique fully contained device, of course, that means kind of activities absolutely important in that form factor as well, along with Ai along with processing it very low bar.

265

00:42:12.420 --> 00:42:24.810

Kevin Cassidy: yeah on those lines with the virtual reality, you know it's been a couple years now since I get to a conference and try out some of the latest technologies, but one thing I always thought was lacking was sound.

266

00:42:25.170 --> 00:42:38.910

Kevin Cassidy: That you might have the view and we'll to look at, but the sound doesn't match your with your eyes are seeing you get busy, is there a you know qualcomm have that you clearly have audio so if.

267

00:42:39.510 --> 00:42:53.730

Ziad Asghar: You Kevin if you look at the latest devices, actually, you will find that experience is just pristine especially some of the newer ones that have come out from oculus I think it's public information those use our product and what you see over there is that.

268

00:42:54.870 --> 00:43:00.360

Ziad Asghar: you'll see it very early on, like you're pointing out, maybe a couple years ago I think when.

269

00:43:01.110 --> 00:43:07.980

Ziad Asghar: What your brain expect if it doesn't get that you feel a little bit unwell, but the current product lines that you have and.

270

00:43:08.310 --> 00:43:14.220

Ziad Asghar: That was the problem with some early products that people did, but at least on all our products, you will see pristine quality now.

271

00:43:14.610 --> 00:43:26.010

Ziad Asghar: And I think quest quest to are some products that are public very amazing experience and very good response from the consumers in terms of what they are able to do okay.

272

00:43:26.040 --> 00:43:29.670

Kevin Cassidy: Great thanks and we'll travel freely.

273

00:43:30.540 --> 00:43:37.950

Ziad Asghar: end, so we will have our tech tech Conference, as usual, and hopefully it will be beyond words for this year and then we'll be able to show a lot of those goodies.

274

00:43:38.760 --> 00:43:49.830

Kevin Cassidy: Right, and can you talk about moving into other markets, you know that's that's one of my themes for reason by reading on polycom know everyone knows you're dominating in the.

275

00:43:50.490 --> 00:44:01.140

Kevin Cassidy: handset market and five g, but you know I think the real growth is when you get into automotive and industrial applications, can you talk about the industrial applications in particular.

276

00:44:02.190 --> 00:44:08.520

Ziad Asghar: yeah I think we have a unique opportunity with you know the way you should think about it, we create these ips we call them.

277

00:44:09.360 --> 00:44:14.910

Ziad Asghar: You know technology for camera technology for audio technology for video technology for Ai processing.

278

00:44:15.750 --> 00:44:20.460

Ziad Asghar: You know the best in class cpus best in class traffic score to be able to do all this processing.

279

00:44:20.970 --> 00:44:27.240

Ziad Asghar: highest peak performance lowest power best features, because we develop and create all of these technologies ourselves.

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00:44:27.960 --> 00:44:38.760

Ziad Asghar: Then you can envision that we are able to when we're designing them you're keeping of course of end markets in mind so as time is going by my team spends a lot of time and making sure that they work for our our.

281

00:44:39.360 --> 00:44:46.860

Ziad Asghar: Current markets such as mobile and on and all the new markets that we're pushing hard into so we we have unique advantage of being able to change those.

282

00:44:47.160 --> 00:44:56.520

Ziad Asghar: Technologies very readily because we have the teams in house that are developing and creating those technologies and then create them for industrial for auto correct saw.

283

00:44:56.970 --> 00:45:07.410

Ziad Asghar: For wearables all of those are or hear about all of those are markets that we have basically taken our core technology modified them upgraded them for those unique and markets.

284

00:45:07.890 --> 00:45:17.280

Ziad Asghar: and industrial again is similar in that regard that especially 5g is finding some very, very unique applications over there, along with the fact that.

285

00:45:18.960 --> 00:45:27.960

Ziad Asghar: You know, audio and camera and all the you know the ingredients that the bacon allow us to be able to set up performance bar.

286

00:45:28.440 --> 00:45:34.350

Ziad Asghar: That, I think, others are not able to get to especially from a 5g perspective, especially for industrial automation and all.

287

00:45:34.620 --> 00:45:44.820

Ziad Asghar: there's some very unique opportunities that we've shared in the past, also but we're able to do a lot of those use cases and, as time goes by, we are of course going to continue to enhance the capabilities.

288

00:45:45.600 --> 00:45:55.200

Ziad Asghar: You know 5g standards continue to evolve continue to add more and more capability to it, and you know we are at the forefront driving the standardization also driving the first come on.

289

00:45:57.930 --> 00:46:10.920

Kevin Cassidy: Okay, and and in automotive also, you have the connectivity, along with your right now I think you're mostly telematics, but I can't talk about Ai being applied into the automotive market.

290

00:46:11.460 --> 00:46:17.370

Ziad Asghar: Oh yeah absolutely so we have a great position and telematics, you also actually have a very good position in Infotainment.

291

00:46:18.300 --> 00:46:26.730

Ziad Asghar: Which is you know kind of the inside the cabin sort of environment, but like I was explaining right if you're driving a car.

292

00:46:27.090 --> 00:46:35.670

Ziad Asghar: What you're able to do is sensors that you have a different right now, you have a sonar you might have a lidar you might have a radar in addition to multiple cameras.

293

00:46:36.000 --> 00:46:42.330

Ziad Asghar: What you need to do is now to do essentially a very similar problem to what we talked about which is, you have to do object recognition.

294

00:46:42.780 --> 00:46:52.860

Ziad Asghar: You have to see if what you're looking at in front is is a light pole or if it is a person from a side view right things of that sort, which really come back to image recognition, but.

295

00:46:53.340 --> 00:47:00.180

Ziad Asghar: What we are able to do is with our great presence and Infotainment today, we believe, with application of Ai we can start to drive.

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00:47:00.720 --> 00:47:10.800

Ziad Asghar: Much more towards a DAS very readily and again with the 10 year of investment done on Ai Ai is the key ingredient, along with camera technology, along with computer the lowest power.

297

00:47:11.280 --> 00:47:16.590

Ziad Asghar: That makes it as work so, for example, there are two types of things people are looking at in Cavan.

298

00:47:17.010 --> 00:47:24.270

Ziad Asghar: So you can have a camera that's pointed toward the person, but it's determine if the if the driver for some reason is incapacitated.

299

00:47:24.750 --> 00:47:34.440

Ziad Asghar: And you would actually be able to, then you know, raising alarm, or, to be able to take certain actions, but of course the as extends into autonomy in the long run.

300

00:47:35.130 --> 00:47:45.660

Ziad Asghar: And some of the platforms, that we have built like the call come right back from us specifically focus for eight hours and autonomy, where you are aligned the car to be able to.

301

00:47:46.110 --> 00:47:52.350

Ziad Asghar: do a lot more than what it's able to do today it's able to you know make certain decisions to make it much more safer.

302

00:47:52.770 --> 00:47:55.800

Ziad Asghar: And the key part we should notice is that if you're able to get to a point.

303

00:47:56.340 --> 00:48:05.490

Ziad Asghar: Where you're able to reduce some of the fatalities and some of the loss of life that happens on the road, with some of these eight as like application that really you know it's something that.

304

00:48:06.240 --> 00:48:17.640

Ziad Asghar: is just a huge advantage for for all of us and you're seeing those develop and polycom technology absolutely is already there to be able to you know, make a big push into a test market as well.

305

00:48:19.530 --> 00:48:31.290

Kevin Cassidy: As i'm just i'm your platform, you know it's pretty well known as the five g smartphones came out that there's probably twice as much content of memory and.

306

00:48:31.770 --> 00:48:44.430

Kevin Cassidy: Other components is that true to when you move to outside the smartphone is the same platform, so you still need a lot of memory with that to support all the API functions.

307

00:48:46.110 --> 00:48:56.910

Ziad Asghar: I think he does not necessarily impose increase need from from a memory perspective, but I think what would you can see, is what we're able to do is with 5g.

308

00:48:57.420 --> 00:49:02.400

Ziad Asghar: You know, a video that you could not have downloaded in the past on your smartphone well you're now you're able to do it.

309

00:49:03.000 --> 00:49:09.990

Ziad Asghar: and be able to actually watch on your device so that causes all of the other capabilities on the device to become better as well.

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00:49:10.410 --> 00:49:14.010

Ziad Asghar: Because in the past, you would not be able to download it and, as such, we would not be able to watch it.

311

00:49:14.430 --> 00:49:24.540

Ziad Asghar: Not only can you download it, you can actually download a higher quality video, which makes your experience much better at the same time with Ai we're actually we showed this up on the floor technology summit.

312

00:49:25.320 --> 00:49:31.500

Ziad Asghar: where you can actually take a lower resolution video and apply what we call super resolution techniques.

313

00:49:32.130 --> 00:49:38.430

Ziad Asghar: With Ai to actually enhance the quality of that video quite a lot such that you can actually send it down at a lower rate.

314

00:49:38.880 --> 00:49:43.800

Ziad Asghar: and be able to actually see it at a higher quality, so we are you already actually have many ways of.

315



00:49:44.580 --> 00:49:50.670

Ziad Asghar: tweaking this trade off between the the transfer rate and how much capability, you need on the device.

316

00:49:51.360 --> 00:49:57.630

Ziad Asghar: And of course now, you can capture much more information we have our camera technology is a lot more capable.

317

00:49:58.320 --> 00:50:12.360

Ziad Asghar: than probably anybody in this space we can do 8k 30 camcorder we can do you know computational hdr technologies that are not even possible on a you know slr like camera were able to do that so.

318

00:50:13.380 --> 00:50:27.510

Ziad Asghar: Because of that, of course, the capability of the device continues to grow, the experience improves markley the consumers of course love it with all the surveys that we look at people really want better cameras on the device and application of the Ai continues to make that much better.

319

00:50:29.880 --> 00:50:40.950

Kevin Cassidy: Okay, we do have a question from one of the participants that you say you're describing a lot like software not hardware, but he says, can you ask.

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00:50:41.970 --> 00:50:46.380

Kevin Cassidy: How exactly is qualcomm implementing Ai functions in the silicon.

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00:50:47.460 --> 00:50:53.970

Kevin Cassidy: Are these matrix multiplication blocks like Google gpu or you know what is your.

322

00:50:54.720 --> 00:51:00.450

Ziad Asghar: Sure, so maybe i'll spend a little time on that we basically law lemon store six generation.

323

00:51:01.500 --> 00:51:08.250

Ziad Asghar: processor for Ai technology last year in December and the way you should think of the hardware, is it has three main.

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00:51:08.700 --> 00:51:15.150

Ziad Asghar: accelerators first of all, we enable people artificial intelligence engine, so you can actually run Ai processing on the cpu.

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00:51:15.570 --> 00:51:26.760

Ziad Asghar: On the graphics and then on hexagon processor, which is our processor for Ai specific, so what you can do is between these three processors, you can actually make trade offs for power versus precision.

326

00:51:27.480 --> 00:51:33.870

Ziad Asghar: And some of like you know, like the gpu is a very good engine for doing floating point which means very high precision sort of math.

327

00:51:34.530 --> 00:51:42.900

Ziad Asghar: whereas what we can do on the hexagon processor is eight bit integer math and the advantage of that is you're able to do the same processing at.

328

00:51:43.350 --> 00:51:49.890

Ziad Asghar: You know, a fourth of the power, for example, but within that hexagon processor engine, you have what we call a scale or processor.

329

00:51:50.220 --> 00:51:57.930

Ziad Asghar: You have multiple vector processors and then you have what we call a cancer accelerator, or you can think of that as a matrix accelerator as well.

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00:51:58.530 --> 00:52:09.660

Ziad Asghar: And if you look at a typical neural network, there is a there's a initial stage for setup and then you might have intermediate stages for pooling and other things, and then you know Finally, the last or to call a fully connected layer

331

00:52:10.260 --> 00:52:19.380

Ziad Asghar: And all of those actually map variable to scale or vector processors and then to the matrix or tensor processing that we have inside the.

332

00:52:20.010 --> 00:52:26.400

Ziad Asghar: topology is actually fairly common between multiple different vendors, but I think like the question of alluded to.

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00:52:26.670 --> 00:52:38.370

Ziad Asghar: it's the combination of software and hardware and how much you can get out of that hardware that actually can make your solution far better than somebody else's and that's what being uniquely focused on to get more and more auto re harbors.

334

00:52:39.990 --> 00:52:55.290

Kevin Cassidy: Okay, now as you're moving into these adjacent markets, you know there's competitors that are embedded are already are in those markets, our you're displacing them, and you know what what are some of the issues what's the competitive landscape like.

335

00:52:56.790 --> 00:53:04.260

Ziad Asghar: I think the advantage like I mentioned, as we do, mobile we force will have a core technologies.

336

00:53:04.770 --> 00:53:11.850

Ziad Asghar: And then, it gives us a very quick ability to be able to leverage those into adjacent markets so, for example, let's talk about you know eight hours again.

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00:53:12.420 --> 00:53:17.460

Ziad Asghar: I think, from from a application perspective, we have built a unique hardware.

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00:53:17.880 --> 00:53:25.020

Ziad Asghar: To be able to do that at the lowest power possible which nobody else can do at this point of time, we think, at least from the combination of software and hardware.

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00:53:25.500 --> 00:53:34.770

Ziad Asghar: Then we built a software stack to be able to get the most out of that hardware as an be able to do more, Ai processing than anybody else for a given amount of power.

340

00:53:35.430 --> 00:53:46.560

Ziad Asghar: So what we can do is, we can basically now take those two things together, and what happens is you take that application for Ai from say mobile or iot or something to automotive.

341

00:53:47.130 --> 00:53:57.600

Ziad Asghar: The models might change, so the sort of neural models that you have become more complex the you might get new what we call operators within the within the software.

342

00:53:58.230 --> 00:54:09.180

Ziad Asghar: stack you might have to have a different stack modification, you may have different sensors like I pointed out, but the core technology does not change in a very big way.

343

00:54:09.960 --> 00:54:17.010

Ziad Asghar: So what we're able to do, then, is take all the for advantage all of our learning and be able to buy and that's what allows us to be able to do it much quicker.

344

00:54:17.520 --> 00:54:24.750

Ziad Asghar: And if you look at any performance per Watt metrics or come all the stands were able to do that a processing at the lowest.

345

00:54:25.230 --> 00:54:32.430

Ziad Asghar: Possible which, especially in the context of TVs or electric vehicles is a huge advantage because you're able to do it processing, which means.

346

00:54:32.790 --> 00:54:37.470

Ziad Asghar: you're able to use the power of doing it, which becomes a very big advantage for you, at the same time.

347

00:54:37.890 --> 00:54:43.470

Ziad Asghar: Within the car the Infotainment aspect also when you leverage qualcomm technology for that you're able to do that at monster power to.

348

00:54:44.190 --> 00:54:50.100

Ziad Asghar: that's just one part of it we're actually able to offer features and technologies that other people don't.

349

00:54:50.760 --> 00:55:00.000

Ziad Asghar: He is pretty complex the way you should think about it, there are two aspects, which is the training aspect, and then the influence aspect, so we didn't call can be very focused on the insurance part.

350

00:55:00.810 --> 00:55:08.490

Ziad Asghar: goes to know, for the most part, training is happening in the cloud further away, but, for instance, we really have developed.

351

00:55:08.940 --> 00:55:11.460

Ziad Asghar: techniques to be able to do it in a very, very efficient manner.

352

00:55:12.000 --> 00:55:23.700

Ziad Asghar: Will will also from a research perspective we're looking at newer areas to how to do on device training, but in a very, very efficient manner, but those are still you know they're in academia and multiple different teams different.

353

00:55:25.020 --> 00:55:26.940

Ziad Asghar: teams are looking at how to do it in an efficient manner.

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00:55:28.770 --> 00:55:29.250

Kevin Cassidy: Okay.

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00:55:30.360 --> 00:55:32.910

Kevin Cassidy: are running close to our deadline date.

356

00:55:33.960 --> 00:55:45.780

Kevin Cassidy: what's on the horizon, you know what what does qualcomm need next as a technology or what were you developing what what's what's going to drive the next generation of snapdragon devices.

357

00:55:46.530 --> 00:55:59.250

Ziad Asghar: Oh, you know there's so much excitement consumers continue to desire, more and more from our devices, they they you know, uniquely are able to see the benefit that they get I mean.

358

00:55:59.970 --> 00:56:09.720

Ziad Asghar: Very simple things I mean we did one we showed this at the technology summit where we could completely do translation on the device so two people could be talking together with each other.

359

00:56:10.020 --> 00:56:12.660

Ziad Asghar: While they are in different countries speaking very different languages.

360

00:56:13.170 --> 00:56:21.030

Ziad Asghar: Right so it's it's unbelievable that we can do all the processing on the device which is very the efficient manner in which you can do the processing.

361

00:56:21.630 --> 00:56:26.850

Ziad Asghar: But we have a lot of that we have applications of like I was explaining earlier applications of Ai.

362

00:56:27.150 --> 00:56:34.620

Ziad Asghar: into different technologies so we continue to make security better on the device, even though we already have a unique advantage on security technology also.

363

00:56:35.010 --> 00:56:44.910

Ziad Asghar: We make security better by the application of Ai because knowing what is happening on the device, you can actually leverage that to make an add another layer of security, on top of what you already have.

364

00:56:45.510 --> 00:56:53.910

Ziad Asghar: You can make graphics better you can make xr er better and then you extend them into each and every new area continue to develop on top of that.

365

00:56:54.660 --> 00:57:07.110

Ziad Asghar: So we think Ai is one of those things where our investments are really helping us get ahead of everybody else from features from use cases and from performance and power perspective.

366

00:57:08.850 --> 00:57:09.720

Great thanks.

367

00:57:11.400 --> 00:57:24.330

Kevin Cassidy: And you know just remind everyone at five o'clock east coast time we'll have a small group session, where we can ask more questions or going into more of the business side of outcomes products.

368

00:57:25.380 --> 00:57:27.570

Kevin Cassidy: So with that i'll say thank you very much for your time.

369

00:57:28.440 --> 00:57:30.330

Ziad Asghar: Thank you for the discussion.