Zebra Your Edge Podcast

Host:

- **Matt Van Bogart, Strategic Global Business Development, Machine Vision and Fixed Industrial Scanning, Zebra**

Guests:

- **Robert Eastlund, President, Graftek Imaging**
- **Tomas Goldaracena, Director of Sales, Graftek Imaging**

Transcript

00:00:00:00 - 00:00:37:27
Matt
Hi. Welcome back to the Industrial Automation Insider podcast. My name is Matt Van Bogart, and I'm part of the Zebra machine vision business. Today, we have a couple guests that are going to share some interesting perspectives of the machine vision industry and market. Both guests are from a Zebra partner: Graftek Imaging. So I want to introduce Tomas Goldaracena as well as Robert Eastlund to this conversation.

00:00:37:29 - 00:01:02:12
Matt
Our topic today is taking a look at the generational changes and shifts that are happening within the broader automation and imaging market. And, joining into this conversation is Robert Eastlund. If you've been in in the machine vision market in North America or in Central and South America, you're probably familiar with Graftek Imaging and Robert in particular.

00:01:02:15 - 00:01:38:07
Matt
He's been around this industry for decades. I've worked with him for years across many different projects and many different types of opportunities. But relatively new to this industry is Tomas. He and I met at the Zebra global sales kickoff meetings that happened earlier this year, and we started having a conversation. And I was asking him his impressions about being in the machine vision sector and particularly what he's learned in the five years that he's been part of this industry.

00:01:38:09 - 00:01:55:28
Matt
So, Robert, Tomas - welcome to this conversation. Thank you. Fantastic. Yeah. So, Robert, I'll start with you. You know, you've had your business I think three decades, if I'm not mistaken.

00:01:56:00 - 00:01:58:07
Robert
Almost, yeah.

00:01:58:12 - 00:02:13:04
Matt
So what have you seen in this industry over the time that you've been, owner, president of Graftek? You know, what are some of the trends or change that you've recognized during that time?

00:02:13:06 - 00:02:50:14
Robert
I think the variety and the number of customers searching for solutions with machine vision has proliferated. You know, years back, there was a great deal of hesitation or even awareness amongst customers that there was something called machine vision. Right? They may had never even thought of it as a solution. Today, it seems to be one of the first things customers look to do is to find a machine vision solution for their inspection.

00:02:50:16 - 00:02:54:07

Robert
And the big changes have been the cost of the materials.

00:02:55:12 - 00:03:04:08
Robert
For example, when I began all those years ago, a 1.4 megapixel camera was over $10,000.

00:03:04:10 - 00:03:05:07
Matt
Yeah.

00:03:05:10 - 00:03:15:06
Robert
Then, so the cost of the equipment comes down to, you know...today you can buy a camera like that, or a 20 megapixel camera, for what...$500 or less?

00:03:15:07 - 00:03:17:01
Matt
Yeah. Yeah.

00:03:17:04 - 00:03:44:16
Robert
The computing power that we had available to us 30 years ago was, what, a 90MHz CPU? [Yeah.] A few megabytes of ram available on the machine. Today, my iPhone here has so much more power than any of the systems that we were working with back then, that it's night and day and there's no comparison.

00:03:44:16 - 00:03:45:00
Matt
Yeah.

00:03:45:03 - 00:04:09:25
Robert
So there's the cost. The algorithms have advanced. We have artificial intelligence, deep learning today at work. We had thoughts of those things back then, but it was more of a science fiction than reality. Today...well, you can't even. It's everywhere, right? It's in my cell phone. It's...

00:04:10:02 - 00:04:11:07
Matt
It is? Yeah.

00:04:11:09 - 00:04:17:29
Robert
We use these algorithms for image processing. It's a different world.

00:04:18:02 - 00:04:41:23
Matt
So. Yeah. And then on the flip side of that, we have Tomas, who's probably grown up in an age where your cell phone has a 20 megapixel camera or it has three cameras and you're working off of a compute platform that, you know, just continues to evolve and get faster and better and more cost effective. So, Tomas, you kind of share your perspective.

00:04:42:00 - 00:04:57:22
Matt
You know, how have you leveraged your understanding of technology and how have you adapted that into your career in sales and application development within the machine vision market?

00:04:57:25 - 00:05:17:14
Tomas
Yeah. So I think the biggest - and I'm going to call it generational advantage - has been that I've grown up, as you mentioned, if not with all the technology that we have right now already available, but gradually increasing as I got older. And so, you know, we went from having cell phones that had like a small megapixel camera into having what we have today.

00:05:17:17 - 00:05:40:28
Tomas
Right. And I've, just my career, you know, whether it has been educational and now professional, has grown steadily with those technological advances. So in the past five years I've been at Graftek, the pace at which the machine vision solutions are evolving and the pace at which the technology becomes available has increased dramatically.

00:05:41:01 - 00:06:09:01
Tomas
And so, you know, for me, the biggest thing, especially the past five years, has been not only remaining current with trends that we're seeing and with the tools that are available but understanding that we still need to leverage the previous 30 years' worth of

machine vision experience that we had before. And so marrying both the best in technology without losing sight of the basics and the fundamentals of machine vision.

00:06:09:03 - 00:06:13:10
Tomas
Yeah. That has been the biggest thing for me over the past five years.

00:06:13:12 - 00:06:54:07
Matt
Yeah. You know, one of the things, Robert, you kind of sparked the memory when you were talking a few minutes ago. You know, I was at one of the west coast machine vision shows probably 7 or 8 years ago. I think it was the Advanced Robotics and Machine Vision Show in San Jose, and I sat through some of the presentations that were being shared by some of the students from some of the local colleges and most, some, of the advancements that they were sharing that was coming out of their research was around the AI space, primarily using cloud compute and large banks of images

00:06:54:10 - 00:07:28:14
Matt
to do processing and create a system that would like automatically categorize a set of images based upon this training model. And it was at that point where I realized that this industry was going to have a massive shift and change, and that that the software, cloud and AI, deep learning - machine learning really was a topic that was being presented most back then - was going to have a monumental shift and change in this market.

00:07:28:16 - 00:07:53:09
Matt
I'd love to get both of your feedback. Robert, first, you: how have you seen this come in to the industry and what are customers asking about? And then as a follow up Tomas, how are you seeing, AI...machine learning, across some of your customers as well?

00:07:53:11 - 00:08:23:24
Robert
So when I think about how things are different today, right, with the AI, the deep learning, you know, setting aside the improvements in hardware - the compute power that allowed these things to function - you have a situation where, before, the day's gone by, and you remember these days, where we would usually look at a project and ask ourselves, "Can it be done?"

00:08:23:26 - 00:08:54:20
Robert
Can this project, this requirement, even be satisfied, with an infinite amount of money being thrown at the project? Right. Today, we don't answer that question, "Can it be done?" It's more, "Can it be done at the appropriate cost for the customer?" Because we know we now have the tools available to separate objects from their background to deal with very complex situations

00:08:54:22 - 00:09:06:27
Robert
that we didn't have all those years back. So, that's...it's a different thought process. It's more of, let's get this done. Not "can it be done?"

00:09:07:00 - 00:09:21:29
Matt
Sure. Yeah. Good, good. Tomas, what are some of your impressions? How are you seeing the evolution of some of this technology being applied into customers and applications?

00:09:22:01 - 00:09:45:25
Tomas
Yeah, I think to echo a bit of what, Robert, said: I think we've gone from customers asking for requirements that maybe five years ago seemed reasonable in terms of what we could do. And then, you know, with the rise - we're going to call it the rise of AI - all of a sudden we're not passing on those opportunities, but rather we are thinking about using AI to solve these complex projects that before we wouldn't even entertain.

00:09:46:01 - 00:10:04:29
Tomas
And, you know, from the customer perspective, you have, of course, this set of customers that are there, they're startups or there are new products they've developed their product with AI alongside their processes, and they understand the capabilities and the limitations, the systems. And they'll come to you and say, "Hey, I'd like to build a vision system and I'd like to include AI on it."

00:10:05:01 - 00:10:25:06
Tomas
Sometimes it's required, sometimes that's not required. But then you also have these large portions of customers that have had vision systems for 25 years with limitations and that are now reaching to us and saying, "Hey, how can I modernize my vision systems? How can I integrate AI and deep learning into my processes?"

00:10:25:06 - 00:10:42:26
Tomas
You know, whether it is using deep learning OCR to simplify, you know, visual processes and things, we're seeing more and more

of that set of customers that are either machine vision experts or automation experts and now see the advantages of incorporating AI, modernizing those systems.

00:10:43:02 - 00:11:13:10
Matt
Sure. Yeah. You know, it's interesting because I've been speaking with a number of, customers recently, you know, trying to get their insights into kind of what they see out in the future, and a common conversation that I've had with really large companies is, you know, five years ago, I think most manufacturers would have been very hesitant to leverage the cloud in their manufacturing, in their operations for a couple different reasons.

00:11:13:10 - 00:11:39:11
Matt
One is latency. Two is security. Three, there really weren't a lot of solutions out there. Now, most customers that I'm talking to are looking toward the cloud for a number of different types of reasons. One is because some of the tools that are available that are very interesting to their operations - not just machine vision, but just automation in general.

00:11:39:13 - 00:12:11:11
Matt
And two, I see a lot of companies really wanting to experiment. They look at, you know, labor shortages, they look at their supply chain. And the thought that I see now in customers is, "How do we innovate our operations? Where are there points for us to really push the boundaries of what we do to increase our velocity to make better products, to improve our supply chain?"

00:12:11:14 - 00:12:38:17
Matt
And so that's driving a lot of innovation in our industry, bringing that topic kind of full circle. You know, we're starting to see 3D really kind of hit its stride in terms of like really broad adoption. Yeah, 3D has been in the market for years, but it's starting to really kind of accelerate the pace at which customers are starting to adopt it because I think it's getting less expensive.

00:12:38:17 - 00:13:08:27
Matt
It's getting easier to use. Some of the resolution capability is starting to open up new applications. I wanted to get your thoughts in terms of kind of the 3D market and what customers are looking at innovating. What are you seeing? What are you hearing? What are customers saying about their level of innovation around some of this technology, 3D, etc.?

00:13:08:29 - 00:13:49:20
Robert
Well, first, I mean, 3D in general allows you to detect...to solve problems that you couldn't have done with a 2D camera very reliably. And so I'm thinking of some of my automotive customers who will now first turn to a 3D camera before even considering - not even considering - a 2D camera, which leads to a bit of hilarity where they could have just used a 2D camera. But now they want the assurance from the 3D, they feel more assured that the results that they're seeing are real with the 3D camera.

00:13:51:21 - 00:13:52:16
Matt
Yeah.

00:13:52:18 - 00:14:20:20
Robert
Yeah. As opposed to where we're dealing with the surface geometry of a part from a 2D perspective and trying to gather information, relying on the geometry, the lighting, etc., to get that information. So, 3D is again - with the speed that's available for image processing - 3D is much more interesting these days than it was years back.

00:14:20:23 - 00:14:54:16
Robert
And the variety of solutions from, triangulation to stereo structured lighting solutions, all being available, the cost being more reasonable these days, the speed at which these images can be acquired at growing in leaps and bounds... just thinking about what Graftek is doing today in terms of systems integration. I think most of the projects we're working on right now involve 3D as part of the solution.

00:14:54:19 - 00:15:18:23
Tomas
Yeah. And I can, you know, on that note, it's one of these things where, working at a company that has both people like myself - and I've been there for five years or so - and then having industry veterans, it leads to interesting conversations because like Robert just mentioned, some of our customers jump to 3D first and that tends to be my view on things at times too, right?

00:15:18:27 - 00:15:36:24
Tomas
We have this complex problem where the customer is trying to measure something, and, you know, Robert will come to me or one of our more seasoned engineers will come to me and their first thought is, "2D camera with a telecentric lens. And, you know, let's measure and do everything." Where in my mind I'm just going, "But we could just use a 3D sensor and be done with it," you know?

00:15:36:24 - 00:16:03:10

Tomas
And so it's the hilarity of, you know, both answers being correct. But having two completely different approaches to the same problem, it's of course a lot of fun, right? That's the best part about machine vision. I think that, you know, with every project being different, it's really hard for people that have personalities where they'll get tired of the same thing every day, to get bored.

00:16:03:10 - 00:16:34:07
Tomas
And, you know, that's my case. And so and when we look at all these applications, like Robert mentioned, you know, at Graftek we talk to our commercial customers who have different projects every day, and then we have our internal integration projects, all using different technologies, all leveraging 3D. And so when you look at that market and you see what happens to us internally, I can only imagine, you know, the level of depth that 3D is going to have into our market and the impact that it's going to have over the next decade where definitely applications will head that way.

00:16:37:04 - 00:17:04:20
Matt
Yeah. Yeah. It's interesting. Yeah. And pointing out the fact that both solutions are correct, but coming at it from different perspectives, then I think that you in general, people, you know, people have their experiences and knowledge and continue to leverage that in terms of their problem solving. But it's also good to have a fresh perspective brought in, you know, new eyes, etc..

00:17:04:23 - 00:17:35:01
Matt
So, I think that's all good. Tomas, I wanted to get your thoughts on how does this industry - and I'll just use automation in general - how does this industry reach out to and recruit kind of that new or next generation of professionals, engineers, salespeople, applications engineers, system integrators?

00:17:35:04 - 00:17:43:16
Matt
What sparked your interest? And how do we find more people like you?

00:17:43:19 - 00:18:04:29
Tomas
Yeah. So, you know, we're going through this right now internally, right? And hiring for machine vision engineers...it's not the easiest thing in the world. There aren't a lot of new grads who are either interested or familiar with what machine vision is, and we always joke that I'm the youngest person in the room by a factor of 20 years usually.

00:18:04:29 - 00:18:35:25
Tomas
And it just has to do with the fact that it's difficult to bring people, without them having prior knowledge about what we're doing. And, for me, I have an engineering background. I actually applied when I joined Graftek my intention was to do development and then quickly, during the interview process, realized that, you know, I could leverage my personal skills with what machine vision was in terms of sales.

00:18:35:25 - 00:18:57:10
Tomas
And that's because I think there's going to be a shift - and I talk to some of my younger colleagues about this a lot - and it's for decades, if not for hundreds of years, salespeople were selling consumer products. No, you didn't need to know how the refrigerator worked. You were just selling that refrigerator. But that has changed drastically.

00:18:57:16 - 00:19:25:19
Tomas
And in the world of machine vision, we're selling complex solutions that require in-depth technical knowledge. So, you know, engineers need to be to be ready to answer those questions with your sales hat and be able to answer difficult questions from customers. And so I think that as machine vision grows, becomes more mainstream, more people see automation as part of their everyday life, not just this thing that they see on TV,

00:19:25:22 - 00:19:43:23
Tomas
they'll definitely be more familiar with it during college, early in their careers. And, it'll bring this stream of young talent of engineers into the industry, which will in turn, of course, improve the solutions that we see everyday and grow our industry drastically.

00:19:43:26 - 00:20:15:13
Matt
Yeah. Well, we'll certainly use this, this podcast and discussion, as an opportunity to cast a wide net out there and help kind of showcase what some of the opportunities look like within this market. So two final questions. Robert, for you, what do you see being kind of the next big thing within the machine vision market?

00:20:15:14 - 00:20:25:11
Matt
You know, what are you particularly excited about? What keeps you excited and motivated each day when you get up and step into the office?

00:20:25:13 - 00:20:53:19
Robert
Well, I think going back to what we have available today, the new tools, 3D, deep learning, better algorithms overall, more compute power. It's that we're able to find new applications to work on - things that couldn't have been done before. So what makes me excited is that I can now tackle problems that, hitherto, I wouldn't have even dreamt of tackling all those years back.

00:20:53:21 - 00:21:15:23
Robert
And that makes me excited because you hear from customers that you might even have spoken with 20 years ago, you know, if they're still...they haven't retired yet. Right. But you know, if they're like, "Hey, do you think we can do this now?" And you go, "Oh, I forgot about that. yeah. I think it's worth looking at today."

00:21:15:25 - 00:21:35:06
Robert
Right. That's exciting. I mean, to be able to actually solve a problem that you wouldn't...that you remember being impractical to solve. Just saying, "Yeah, we can do that." That's a that's a fun thing. That gets me excited.

00:21:35:09 - 00:21:55:16
Matt
Yeah. Plus, it's rewarding to be able to help your customers, achieve things that help improve their production, the quality, the velocity, their factory, whatever. And so it's very rewarding to be able to provide those types of solutions.

00:21:55:18 - 00:22:29:17
Robert
And as far as technology goes, I'm very much interested to see how much how compact the solutions can become. Right. We have smart cameras now on a chip on the sensor itself, in the layers behind the sensor...to see the computing power exist there. You know, when I remember the machine vision system taking up most of the desk to now be able to hold the whole system in the palm of your hand.

00:22:29:20 - 00:22:33:07
Robert
That's something to be excited about.

00:22:33:10 - 00:22:50:07
Matt
Yeah. Yeah, for sure, for sure. And Tomas, kind of what do you see out for the next, say maybe 5 to 10 years? What do you see in terms of like innovation? What gets you excited.

00:22:50:09 - 00:23:08:24
Tomas
Yeah. Well I mean AI of course is going to open a whole range of opportunities. I think, usually, when products become as mainstream as AI is becoming right now, I mean, we're at the early stages of what we can do. And people, like we said before, you can have AI applications in the palm of your hand now.

00:23:08:26 - 00:23:37:03
Tomas
It's going to open up a whole range of opportunities, for machine vision, both because new companies will come out that will develop products that will need to be inspected. And so, you know, machine vision will always have to be there, but also because of the machine vision tools, which just become much more sophisticated. So what excites me is that, you know, being early in, in my career in this industry and looking at the next, you know, 25, 30 years, the rate at which this will change will be dramatic.

00:23:37:03 - 00:23:55:18
Tomas
And I'll get to be part of the ride the whole way and get to experience and help our customers, you know, leverage new technologies every year. And it's an exciting thing as a young engineer and as a young salesperson to be able to see, you know, be part of an industry that is ever changing and evolving.

00:23:55:21 - 00:24:29:09
Matt
Yeah. Yeah. Excellent. Well, Robert and Tomas, thank you very much for being part of this conversation. I think it's highlighted for me a couple different things to think about within this industry. One is just the rapid change of pace of how technology continues to evolve. And I typically reflect, you know, towardsthe end of the year, back on the year, and it's like, wow, just, you know, the innovation that's happened just in the last 12 months always amazes me.

00:24:29:09 - 00:24:50:26
Matt
And I always think, man, there's no better time to be in this market and industry. And then next year it's even better and better and better. So I want to thank both of you for being part of this conversation and bringing your perspectives on automation in the machine vision market. So, again, thank you for your time.

00:24:50:29 - 00:25:20:16

Matt
And I want to conclude by inviting those of you watching or listening to this podcast to visit zebra.com, wher
other conversations in this Industrial Automation Insider podcast series where you can listen to customers and p
salespeople and engineers share their perspective on what they see happening within the automation and machine

00:25:20:16 - 00:25:26:15
Matt
So I'm Matt Van Bogart, signing off. Thank you again. Robert and Tomas.

00:25:26:17 - 00:25:27:03
Robert
Thank you Matt.

00:25:27:10 - 00:25:31:12
Tomas
Thank you Matt. Yeah.

00:25:31:15 - 00:25:31:24
Tomas
All right.