# Transcript: How Vigilent is using AI to reduce carbon emissions

Robin Christopherson

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Great, welcome back guys to another episode of The AbilityNet Podcast. In this series we are interviewing, visiting with, winners of the recent T4G Awards 2023. And I'm really pleased to be interviewing Cliff from Vigilent, that's Vigilent with an E as opposed to an A. And Cliff is very kindly coming in from way across on the West Coast of America. How're you doing, Cliff?

Cliff Federspiel

Fine, thanks. Thanks for having me, Robin.

Robin Christopherson

Brilliant. So yeah, if there's a tiny bit of a delay, guys. Apologies in advance. So, before I ask you to introduce yourself, Cliff, and a little bit about Vigilent. We always start with a very cheesy question, which is what hot or cold beverage are you using to help you get through this ordeal? I've just got some iced water here. I think my ice cubes have melted because it's...

Cliff Federspiel

An iced flat water for me.

Robin Christopherson

Nice. Nice one. Yeah, we're having a heatwave here in the UK, like 30 plus degrees, breaking all records.

Cliff Federspiel

Oh, that's hot for there.

Robin Christopherson

Yeah, yeah, it is. It's probably nothing. It's probably business as usual for you guys over there.

Cliff Federspiel

Well, where I am it's not so hot. But yeah. Other places. Definitely.

Robin Christopherson

Yeah. I mean, you've had your fair share of excitement. Recently. Weatherwise. So yeah, let's, let's keep things nice and simple for a while. Brilliant. So Vigilent, winners of the sustainability category of the Tech4Good Awards. So, do you want to just briefly introduce yourself? Who Vigilent are and a little bit about what you do?

Cliff Federspiel

Okay. So, I'm the President and CTO (Chief Technology Officer) and one of the Co-Founders of Vigilent. Vigilent has been in business, incorporated since 2008. And we focus on primarily on optimising the heating, ventilating air conditioning of mission critical buildings that we do have a solution as well for, you know, office type buildings, and we optimise HVAC (Heating, ventilation, and air conditioning), for those types of buildings. We do that with smart software that uses Artificial Intelligence (AI) and Machine Learning to solve a really pretty complicated optimisation problem. In these mission critical, very important buildings. The outcome of that is a lot of energy savings, a lot of carbon reduction, but a whole bunch of other benefits, like, you know, making the staff more effective. extending the life of expensive capital equipment and, you know, reducing maintenance costs and things like that. Yeah, so that's a, I guess, a short intro to me and into Vigilent.

Robin Christopherson

Brilliant, thank you so much. So how did it feel to win the award personally, and, you know, what do you think the impact will be on your organisation going forward?

Cliff Federspiel

Well, you know, a big part of our value proposition is energy efficiency and sustainability. And it's, you know, it's an important thing to, I think most of the people who work at Vigilent, it's part of our culture. And so being recognised for the very thing that is so important to so many Vigilent employees, I think is, you know, really powerful and rewarding for us. Yeah.

Robin Christopherson

Great. I mean, ESG (Environmental, Social and Governance) is obviously red hot, excuse the pun. There's nothing hotter and obviously, you know, for obvious reasons, we can't carry on being quite so blase about the environment, etc. Use of natural resources and wanton use of energy. Offices are getting more efficient over here, I'm not sure if it's a global thing, but we have this bream compliance regime where you know offices can be more energy efficient, and the providers can choose greener resources or kinds of sources or suppliers of energy. So yeah, what's the sort of sustainability angle when it comes to the use of AI and trying to make these buildings more efficient? I mean, AI is everywhere, obviously, and I'm just really interested to dig into how AI is being used in this exact application, you don't have to go too deep just kind of give us the basics.

Cliff Federspiel

Well, so you know, AI means a lot of things to a lot of people. There's lots of sort of subcategories of AI. But for, you know, commercial and industrial systems, AI, and Machine Learning, helps to optimise their performance to do you know, a lot of people think of AI as sort of making machines that have human like abilities. But really, for, you know, commercial and industrial, machinery, and systems, what AI and Machine Learning does is help those systems operate in a way that people can't operate them, better than people can operate them. So, like, just to give you an example, I was meeting with a customer not too long ago, and this person is responsible for operating, you know, managing the operations of three really large, important data centres for his organisation. And in one, just one of those, he's got a 15-person team of engineers that keep the place humming. And what he said to me is that his Vigilent system can do for him, things that his 15-person engineering team can't do. So that's, you know, that's one aspect of what AI can do for you and these data centres are really energy hungry. So, when you can reduce the consumption by 10, 15 or 20%. Overall, it's a really, really big number makes a big difference in our bottom line and helps them you know, run more reliably, it's a big deal. And then there's the latest AI that's, you know, sort of all the range right now, which is generative AI, and in particular, the large language models, you know, where you can now chat with AI. And, and I think this is gonna make a big difference to commercial and industrial automation, as well. Because all of these systems that operate, you know, these big complicated, you know, whether it's HVAC, or some industrial process, and manufacturing process, whatever, they all have these software systems that are basically big, complicated web apps, and they're all different. And so, it's hard to, it's hard to use them, really, to their full effectiveness, because they're all different, and they're all complicated. And, you know, there's not a, you know, there's like somewhat of a resistance to adopt them. Because learning to use one of them, like learning to use a Vigilent system isn't the same kind of transferable skill, as, say, learning to programme in Python, right. So I think what, what we're going to see with the generative AI and large language models where the AI can now sort of, in a way converse with you, this is going to make those systems much easier to use and much more effective, because you can then you know, get the most out of them using features that are, you know, hidden somewhere in the UI (User Interface) or something like that, because you can just ask them, How do I get to this thing? Or how do I do this? And it can just tell you?

Robin Christopherson

Absolutely, and the prompt that whether it's voiced or, you know, verbalised, or written is the new UI, isn't it with Chat, GPT and other large language models? So, it's kind of we're going right back to the command line from after that.

Cliff Federspiel

Yeah, and I think that's a really interesting thing because, you know, the communication skill that everybody has is spoken language. Right. And then the next one is written language. But we have pretty good technology to translate, you know, speech to text. And what that means is that yeah, we can now start using our most native way to communicate in order to communicate with complicated automation systems.

Robin Christopherson

And I love the fact that you know, this growth, this monumental growth in AI, particularly generative AI, which is hugely computationally hungry, is driving a lot of the data centres like you were talking about and their power consumption. And then along comes Vigilent and is saying, well, actually, we can use this same technology to help reduce, well help increase the efficiency of these data centres. You were saying by as much as 20%. That's amazing.

Cliff Federspiel

Yeah. Yeah. Well because see here's the thing in, the more critical the data centre, the more that they intentionally over design it, so that it has a lot of excess capacity and a lot of redundancy. And then, without a really effective automation system, what operators will do, you know, even that 15 person team at that data centre I described, they'll often run and operate, you know, the data centre with more machines than they need to, more airflow than they need to, more cooling and heat rejection than they need to. Because, you know, the most important thing is that it's just up 24 by seven. Right. And so, yeah, it's, you know, it creates an opportunity for AI and Machine Learning and optimisation to make a big difference.

Robin Christopherson

Absolutely, yeah. It's a hard maths problem. So yeah, it's amazing.

Cliff Federspiel

Absolutely. And it's, it's hard to do hard math in real time. You know, in your head, people aren't good at that. Machines are good at that.

Robin Christopherson

Cool. So, yeah, AI, we let's carry on talking about AI, then because it's definitely not going away. Are you, do you plan on embedding it in other products that you do? Or kind of further in? You know, what's the roadmap for Vigilent in terms of helping with sustainability? You know, what's your product roadmap, whether or not it includes AI, but I'm also particularly interested to know, whether you've got, you know, further thing, this massive wave of generative AI and large language models, etc.

Cliff Federspiel

Yeah, good question. So, you know, there's a huge amount of R&D that's gone into this technology in the last couple of decades, right. And so, one of the things that we're doing is leveraging that technology to make, you know, to just simply improve the ability of our software to optimise and to do things like detect problems that are hard to detect, manually. You know, the funny thing about this machinery and data centres that gets the heat out, you know, you can walk up to one of these machines, and it might be, you know, vibrating and making noise. And if you can stick your hand in the air stream, you'll feel air blown behind, it might even feel cold, but it might be broken, it might not be working properly, in which case, it's both probably wasting energy and posing a risk to that uptime that is so critical, you know, that 24 By seven uptime that's necessary. So, we're leveraging the past two decades of R&D to continually make that optimisation, that fault detection, that ability to peer into the data and see things that people can't see with their own eyes and ears and reveal it to our customers so that they can operate more effectively. And then likewise, like I said, we are looking at clever ways to use the generative large language models to make our product easier to use. So to help people with tech support, tech support in the product itself, you know, navigate the UI, all those kinds of things that, like I said, are, you know, it's hard, there is no standard for how you design a web app to you know, I mean, all of these systems have like sensors and actuators, right? And there's no standard for how the web app allows you to move a sensor from one place to another inside a building, every one of them's different. But what large language models are going to give us the opportunity to do is just simply say, how do I move the sensor or maybe even move the sensor for me?

Robin Christopherson

Yeah, I mean, the possibilities of AI, in every business is just almost and you know, the sky's the limit, you know, it could be to help with optimising your code. Because you know, they can code it could be to help make your code more accessible, because obviously, you know, as part of our remit, we want to make sure that everything that is digital is as inclusive as possible as well. And that's a hard math problem or a hard UX and design problem too. There's a lot of things that current technologies can't dig into and, you know, ascertain how inclusive they are like JavaScript, for example. They you know, there's no checking systems that can even touch JavaScript. So, you know, it's really difficult to know whether code works well is, you know, optimised for performance, but also for inclusion as well. And you know, AI is going to be all over all of that. And while it's at it, it can, you know, create your, your comms and your, you know, social media videos, and, you know, refresh your website with a different tone every six months, or whatever it is, you want to say, yeah, the sky's the limit. That's, that's really amazing. And you guys are obviously, you know, geared up for practical applications of AI today. And, you know, we'll be going forward as well. Anything else that you want to talk about? Before we wrap it up? You know, anything, we haven't kind of covered yet?

Cliff Federspiel

Well, I just like to say thanks again, for the award. It's really, like I said, it's, it's at the core of who we are sustainability. And I just really appreciate that. And, you know, the work on making technology accessible, I think, is great. And it's good that that you guys are, you know, really on top of that. And, honestly, I think that this AI revolution is going to help a lot with that, right? If you can speak to a computer, instead of having to, you know, type, and read and all that it's obviously going to make, you know, the accessibility to, you know, automation systems much more, you know, easy for, for folks. That's all going to be great.

Robin Christopherson

Yeah, I mean, smart speakers have been revolutionary for people, not just from, you know, utility point of view, but also ease of use, and affordability, you know, the bar entry level to getting a smart speaker is, you know, very, very low 20 $30, that sort of thing. And they're so massively useful. And, you know, you don't have to read a manual or anything like that, and they, you know, can be incredibly useful. And if you just expand that out to the sort of smarts that you have, in the current crop of and future, you know, gents of generative AI, the sky's the limit, and disabled people who would struggle with, you know, from a cognitive, maybe a motor or a vision point of view with more traditional UIs. Yeah, it's a really, really exciting time. Fantastic.

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The other thing, just before we go that, I think, is, it's not quite the same thing, but like I said, all of these industrial and commercial automation systems are different and hard to use. And it's a barrier actually, to getting new capabilities, you know, into the market. Because, you know, operators resist their use. So, I think that what AI is going to do by making it easier to use them, it's going to accelerate adoption. And just to give you an idea, you know, Vigilent if you if you took how much energy and carbon Vigilent it takes out of, you know, the environment, and extrapolate that to the whole of the industry that we're in, you know, basically building automation, whether that's data centres, or commercial buildings, because so much of the carbon emissions come from buildings and industrial systems and stuff like that, you know, you could reduce global carbon emissions by, you know, a material amount, maybe 3 to 4% of all of it, if you just had 100% adoption of technology like ours. And so, I think that, you know, this AI revolution is going to help accelerate that adoption and move us towards the point where software-based optimisation is able to make really a material impact on environmental emissions worldwide.

Robin Christopherson

Absolutely. Do you see a time when, you know, there won't be any sis admins or IT (Information Technology) you know, CTOs (Chief Technology Officer), because the AI will be you'll be managing it all, and doing a really good job?

Cliff Federspiel

I don't see that. I don't see that happening soon. I mean, certainly, there are some roles that are going to change dramatically. But I think that what it's going to do is sort of unblock the usage of this technology, right? It's just going to make it easier and make people want to get it because the benefits are going to be there and they're actually going to grow. But you know that the cost, the cost to learn it and use it is going to go way down.

Robin Christopherson

Yeah. And hopefully implement it in the first place too, great. Cliff, thank you so much indeed. Congratulations. Again. Keep up the brilliant work. You're really valuable. I'm trying to think of some more ways that we can reduce global warming while you're at it, please, that would be brilliant. We need all the help we can get. Thanks a lot. Have a brilliant day.

Cliff Federspiel

Okay, you too.

Robin Christopherson

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