

**EPISODE 51**

**[0:00:10.5] SC:** Hello and welcome to another episode of TWIML talk. The podcast where I interview interesting people doing interesting things and machine learning and artificial intelligence. I'm your host Sam Charrington. A few updates before we jump into our show. This week, October 10<sup>th</sup> through 11<sup>th</sup>, I'll be in Montreal for the Rework, Deep Learning Summit.

We held a flash giveaway last week for one lucky listener to get a chance to join me at the conference. That winner is Matt Stone, a listener from Toronto. Thanks to everyone who entered and be on the lookout for more giveaways to close out the year.

Hey, if you're in the Montreal area, I'd love to connect. Reach out to me via Twitter or the contact page at [TWIMLai.com](http://TWIMLai.com) if you'd like to meet up. The show you're about to hear is the first of a series of shows recorded in San Francisco at the Artificial Intelligence Conference which was hosted by our friends at O'Reilly and Intel Nervana.

In addition to their support for the event itself. Intel Nervana is also our sponsor for this series of podcast from the event. A huge thanks to them for their continued support of the show.

In this episode, I speak with Naveen Rao, vice president and general manager of Intel's AI products group and Scott Apeland, director of Intel's developer network. It's been a few months since we last spoke with Naveen so he gives us a quick update on what Intel's been up to and we discuss his perspective on some recent events in the AI ecosystem.

Then, Scott and I dig in to Intel Nervana's new dev cloud offering which was announced at the conference. We also discussed the Intel Nervana AI academy, a new portal offering hands on learning tool sand other resources for various aspects of machine learning and AI.

In addition to my conversations with Naveen and Scott, this show is packed with more interviews that I know you'll love including Paul Tupper of Nuance on conversational interfaces, Garner Carlson of Stanford and IASDI on topological data analysis.

Laura Froilic and Mo Patel of Think Big Analytics on some interesting machine learning use cases they've implemented and Ian Stoiga of UC Berkley on his work at the Rise lab and Rey. A new platform for reinforcement learning. Finally, a quick reminder about the upcoming TWIML online meetup. On Wednesday October 18<sup>th</sup> at 3 PM pacific time, we'll be discussing the paper visual attribute transfer through deep image analogy by Jing Liao and others from Microsoft research.

The discussion will be led by Duncan Stuthers. To join the meetup or to catch up on what you miss from the first two meetups, visit [twimlai.com/meetup](http://twimlai.com/meetup). Now, on to the show.

[INTERVIEW]

**[0:03:07.4] SC:** All right everyone, I am here at the AI conference brought to you by O'Riley and Intel Nervana and I'm here with Naveen Rao who is the general manager of Intel's artificial intelligence products group. Welcome Naveen.

**[0:03:22.4] NR:** Thanks Sam. Great to be here.

**[0:03:24.2] SC:** It's great to have you here. We're going to spend a few minutes this morning just catching up on what Intel Nervana's been up to and then we've got a really interesting interview schedule to talk about one of the products that you guys are announcing here at the event.

**[0:03:39.1] NR:** Sounds great.

**[0:03:40.2] SC:** What's new?

**[0:03:42.3] NR:** Well, it's been a very eventful few months, you know, we started the artificial intelligence products group about five months ago now and you know, really getting resources around Intel aligned around this focus area now. The company has been super supportive from the top down to make this happen and I think you know, it's a reflection of the importance of AI to Intel.

We want to be at the forefront of it. Not just from the product sampling but also for the research standpoint.

**[0:04:09.0] SC:** you made some announcements at the event today, tell us a little bit about those?

**[0:04:13.4] NR:** A lot of it is around our connection with developers, the dev cloud was one where we can connect with developers, get them working on our tools but also training people. There's a big appetite right now for knowledge and understanding how to build AI solutions and how to actually solve industry problems and we put together a very nice sort of tutorials.

Intel Nervana Academy and also having computational support for those tools and actually computational resources available is what the dev cloud is about. You know, that will actually go hand in hand with Intel Nervana cloud coming up in the future where you can get access to a way to the grace technologies.

**[0:04:49.8] SC:** Okay. Where can folks find the tools that the documentation and tools that you released?

**[0:04:55.8] NR:** From [intelNervana.com](http://intelNervana.com) or just Google Intel Nervana Academy. Okay.

**[0:04:59.7] SC:** Awesome, is the dev cloud, what's the relationship between the dev cloud and Intel Nervana cloud that's forthcoming?

**[0:05:07.1] NR:** The dev cloud is really meant for developers in education whereas the Intel Nervana cloud is actually the enterprise grade solution for companies. You know, one is more – here's access to our tools in a package format, the other thing is the Intel Nervana cloud is really our latest technology, a very low cost way of getting access to it.

**[0:05:27.1] SC:** Okay. Then you've got a key note tomorrow that you're doing with Steve Jarvis? What are you going to be talking about there?

**[0:05:35.2] NR:** Well, as you know, Steve may have been, as you may know, Steve was one of our early investors at Nervana and you know, has really become an industry expert in this area and you know, I find it very fortunate to have him involved with us from the start, guiding some of our direction and you know, really just be a conversations between us, talking about you know, some of the things that are exciting coming up, you know, how hardware is going to evolve or the future of AI and drive the future of AI.

What is the future of AI, what kind of problems will you be solving, why is it important, it's really going to be a conversation and should be entertaining.

**[0:06:06.0] SC:** What is the future of AI?

**[0:06:07.4] NR:** I want to save that for tomorrow.

**[0:06:09.8] SC:** Well, I promise you no one will hear this before tomorrow.

**[0:06:13.1] NR:** Okay, I think one of the main messages from my perspective is, AI is really a set of techniques and allows to scale intelligence. We can now take in more resources that we can possibly do as individual humans, you know, loosely coupled by language, that we're hitting that fundamental limitation now because we've gotten really good at gathering data and now we have too much data and we actually can't do much with it as individuals.

Humans can't scale that level. We need to build technologies and allow us to do it. It's really kind of continuing along the evolution of the scientific method. Humans form this procedure to really make testable, repeatable results and try to get to the ground truth of the world. I think this is part of that, right? We just want to do it on a bigger scale.

You know, one human can only experience so much but we can actually now put devices out in the world, I can experience a lot. Bring it all together. That's really what I think AI is about and why it's important. It's really allowing us to continue along the evolution of what it needs to be human.

**[0:07:11.8] SC:** One of the things that came up in the key notes this morning was – is related to a comment you just made, we've become really good at gathering and collecting data but not necessarily so good at collecting labeled data sets that are trainable to create machine learning models and AI models. Is Intel doing anything in that space at all?

**[0:07:30.8] NR:** Yeah, I mean, there were three fundamental types of learning, there's what you just described would be called supervised learning, this is really about taking data that's already been annotated by human and saying this is what we want to get out of a model.

Reinforcement learning is more like how you train your dog, dog did something good, you give him a treat and he does that good thing more often. The other I would say, the big frontier right now is unsupervised learning and that's really about finding potentially useful structure and data, before you know what you want to do with it and that's really what needs to be cracked.

To enable this kind of scalability because actually going through and labeling all the data in the world is not possible, right? if there's too much already, if we froze the world today and handed out a hundred megabytes, every man, woman and child would plan it, it would take us 30 years to get through all of it.

You know, that's not something we can, that's possible, the only way to do it is to crack it from an algorithmic standpoint and then throw the computational horsepower at it that we're building. That's I think one of the big things we're going to see in the next couple of years, research into unsupervised training world. We are doing that as well and providing tools to our researchers to move forward.

**[0:08:36.5] SC:** Are there any particular examples of progress in that space that comes to mind for you or that you've helped – your tools are helping facilitate?

**[0:08:45.9] NR:** I think GANS, generative adversarial networks are a big one, this is something that started becoming popular about a year, year and a half ago. Showing some really promising results now and you know, this is towards more unsupervised kind of methods.

What our tools have helped there is really the speed. GANS are computational intensive, they take a lot of horsepower and a lot of time and you know, four years ago, you simply couldn't do it, you just didn't have the tools and computational capabilities that we have today by providing better tools faster, more scalable, larger parameter memories, these kinds of things, we can actually drive these fields forward.

The way I see it is like, when we put out a new architecture that has fundamental new capabilities, smart research is going to do things with it that we had never even thought of, that's what I think is really cool.

Not the stuff that we're thinking about, that should work but other stuff that's going to happen.

**[0:09:39.4] SC:** Yeah, very interesting. One of the things that I remember from our last conversation was we're talking about Intel and Intel's role in the space and you made a comment to the effect that hey, you know, we're in the first inning, if that, right? In the context of tools.

I think last time we talked a little bit about the support for Nervana graph and some of the projects that were announced last time at the AI conference in New York and a lot of the conversation was around support for Tensor flow as kind of the, one of these back end frameworks and interestingly enough, I think a few months ago, everyone thought that Tensor flow was like the crown king and the game was over.

Now like out of nowhere, we're hearing about Pie Torch all over the place.

**[0:10:24.5] NR:** I'm going to go there.

**[0:10:28.6] SC:** I'm just wondering if you have any thoughts or perspective on the market and how it will evolve and what we should expect to see.

**[0:10:36.1] NR:** You know, you can look at the past, we saw the same thing happen with web technologies, right? Same thing happening, there's a new web technology to do responsive, dynamic web pages out every year. I can't keep up because I don't do that stuff anymore.

I think you're going to see a very similar thing happening here when there is a new set of capabilities that kind of catapult some set of researcher that everyone's going to use it.

Tensor flow was kind of favored for the last eight months, nine months, we'll see what happens in the future. I think there's plenty of room for innovation, it's not a done deal by any means.

I think I even said that then, it's like "yeah, I've seen this happen, I've seen this game before" and we'll support what's out there of course, you know, we want to provide innovations through our own software stack that we own and open source and beyond.

On top of end graph but we obviously want to support what the community's using more broadly and if that's Pie Torch, great, if it's Tensor flow, great too, we have no problem with it, I think you know, we're providing that computational substrate under the hood. We want to make sure that researchers have access to what they need.

**[0:11:40.2] SC:** More broadly, what do you see is the role of ecosystems and enabling AI solutions and you know, AI tools to evolve.

**[0:11:49.7] NR:** Ecosystems are absolutely key, right? Just one person who can do this on their own, right? It's just not going to happen, not even one single big company I think. There's too many smart people working on this problem to not work together on a common set of tool and common language, right?

The way the big problems are going to get solved like it provides from things like that is really through this openness of publishing, you know, people putting stuff on archive, it's great but then having paid review and paper's accepted by nips. ICML conferences. Then providing the code actually, show them rotations.

That's been a very virtuous cycle I think. We've seen a lot of innovation happen quickly, you get something out there, the code's up there, you can download it, play with it, modify it and then put out the next thing on top of it, right?

I think it's actually a great paradigm for any kind of innovation.

**[0:12:36.1] SC:** yeah, absolutely. Anything else you'd like to share with us?

**[0:12:40.4] NR:** Yeah, I think it's going to be very exciting in the next year or so, we're going to be making a lot of announcements about some of the things coming to fruition, I mean, we're making a lot of bets right now, you know, we've come from a place where Intel's a CPU manufacturer and that's how people are perceiving it a year ago and now we're going to be providing leadership and AI, I think it's very exciting to see that transition and be part of it so stay tuned for some cool things coming up.

**[0:13:04.1] SC:** Along the line of some of those bets, you recently, or Brian recently published a blog post that talked about the billion dollars that the company's investing across the AI spectrum, any comments on that? There were a number of startups mentioned and some other things?

**[0:13:18.5] NR:** Yeah, Intel is a huge, if not the biggest VC in the valley. We invested a lot of different kinds of companies, I mean, obviously we look at it from strategic value standpoint but also, just from a monetary return, just like a VC. We've placed a lot of bets there and you know, want to see the ecosystem to build and innovate and startups are where a lot of that happens. Then beyond that, some of that investment is also internally what we're doing in aligning our resources around.

I think it's again, it's a really good readout of the emphasis, focus we're putting on AI in Intel.

**[0:13:52.2] SC:** Yeah, absolutely. Well great, thanks so much Naveen for joining us and looking forward to catching up with you next time.

**[0:13:58.8] NR:** Absolutely, great talking with you, great.

**[0:14:07.3] SC:** All right everyone, I'm here at the AI conference with Scott Apeland who is the director of developer programs with Intel Nervana and we're here to talk about the dev cloud that was launched today. Welcome Scott.



**[0:14:21.0] SA:** Thank you, it's good to be here.

**[0:14:22.4] SC:** Great to have you. It sounds like you had a big launch last night? How did it go?

**[0:14:28.2] SA:** Really went well. Back about 10 months ago in November last year, we announced our AI Academy so this was our program for helping students, developers, teachers, really have more – learn more about AI, how to use it, get access to the technology and the tools so we kicked that off.

Today, we really announced the next stage of that which is making cloud compute accessible to a broad set of developers and students with our new Nervana dev cloud.

**[0:14:57.5] SC:** Okay. Tell us a little bit about the dev cloud and what the focus is there and in particular, you know, compute, unlike a few years ago, compute is much more readily available on you know, various public facing, consumer clouds, what's different about dev cloud?

**[0:15:14.7] SA:** Yeah. Well, you know, one of the challenges for folks getting started in AI is actually having access and being able to get started with compute in a way that's economical for them without having to invest in it.

For all of our academy members, they'll have free access to the dev cloud and this is a very large scale cluster and it will have the latest Xeon scalable processors on there and developers can sign up, they can use it to sandbox a new project they're working on, they can use it for their homework exercises they're doing in class, they can do just the test about things or if they have a compelling project, they really want to get started and use it.

As academy members, they sign up, they'll be given access, they can start for four weeks and use it for four weeks and then at the end of the four weeks that they need it longer, then post the project they're working on, we'd like to see what they're working on and let other developers see what they're working on and they can get extended for another four weeks or even longer if it's necessary.

In this way, they're getting access to as much cloud compute as they're going to need for quite a while to get them up and started. It's not for commercial production type of applications but a great way to get started.

**[0:16:30.2] SC:** Great, is there use of the dev cloud limited to, it doesn't sound like it's limited to just exercises that are part of the academy, they can do any project that they come up with?

**[0:16:42.1] SA:** Yeah, let me just spend a few more minutes talking about the academy what it is and then you can understand how they use the dev cloud. The academy includes a lot of learning resources so tutorials, online classes, webinars, webcast from basic getting started, machine learning 101, deep learning 101 and intermediate to advanced so a really good curriculum to learn about AI but if you're already a professional developer and you just want to –

Hey, let's use the latest software that's optimized, let's maybe use neon framework or some other new Intel technology, you'll have access to that in the academy and then you'll have technical support.

We have a room mix of professional developers, students are getting started, graduate students are working on research projects and they can all use the dev cloud. For example, just last night, we had a dev jam here in San Francisco, it's day zero of the O'Reilly Conference and we had about 500 developers, students, startups attend this and on the stage, I did a fire side chat with six of our students who are working on projects.

The types of projects that we're on, just amazing, especially when you look at the variety. One of them was doing a project on epilepsy and he's doing EEG scans and connectivity analysis of the brain and using that to help patients manage epilepsy and predict seizures, things like that.

He's working out, just the fast thing to project there. Another student was doing a trail cam project so if you're out in the wild and you have a trail cam, not only does it turn on record when wildlife passes by, it will try to recognize what type of wildlife that is and alert you.

If it's a dangerous, yeah, if it's a dangerous one then tell the campers nearby, time to get out of there. Another student is working on mosquito detection and identification. Because mosquitos,

there's thousands of varieties but there's only a small number that are real dangerous that maybe carry malaria or zika.

He is creating an application where I would take a photo, recognize what type of mosquitoes and tell you if it is a dangerous type. So that is just a sample. Oh another fun one that I liked is a student from Rutgers who has developed an application where it will scan your head, look at your facial structure, your head structure and then based on popular hairstyles that you have similar facial structures recommend hair style for you and maybe a beard style as well.

So you never have to worry anymore about what just get a haircut, just have this app tell you exactly what your hair should look like and go get a cut like that. So quite a variety of things they are working on and they have access to the dev cloud and toward technical support as well because we announced also today that we have a partnership with Todock Consulting Services to put into place AI center of excellence and we are going to leverage TCS's expertise in AI.

And use that to help to support the academy members. So when they need to get stuck on the project or using the dev cloud, we'll have special engineers who can support them and provide the support to help them and they'll be located around the world because TCS is a worldwide organization.

**[0:20:17.9] SC:** Now TCS is a consulting company. It's hard to get a consulting company to do anything without dollars changing hands. If I am an academy member and I run into something and I need some help, how does that go? Do I raise my hand and?

**[0:20:35.9] SA:** Yeah, so the beauty of this is for the academy members it's free and of course there's a business model for Todock Consultancy in this as well but for academy members, both the dev cloud and the support and the tutorials and training, it's all free and our desire is to help as many students, developers, get smart learning it and discover new ways of using it as possible.

**[0:21:00.2] SC:** And then is there a mechanism where if I say I am working on something, it starts to others a little side project and then corner of the office or something like that and then it grows something that is more important for my company like to get more help?

**[0:21:18.5] SA:** Yeah, we do look for that. So we are always monitoring, watching for those really cool things to emerge and see how can we help them be more successful. A lot of times they will start to attract all kinds of support and interest in general but early on, it's really helpful if we can say, "Hey this guy has got something going here. Let's give him a little extra boost" so we are looking for that constantly and on my team what we've developed to do this a program called Student Ambassadors.

So since we rolled out the academy, we've been going out to universities worldwide and run workshops, AI workshops and we'll introduce the technology to them and give them the basics and then we'll hear what the students are working on and the students are really passionate doing something really cool, we'll see if they want to become ambassadors for Intel and if they're interested then we'll give them even more training, more access to technology.

And in return just ask them to go tell other students about what they are doing and share their knowledge. So these six that were on the stage with me last night were ambassadors from UC Santa Barbara, one from MIT, one from Rutgers, one from ASU and that's just the US. We are starting to have ambassadors all across the world from India, China, lots of them in Europe as well and I'd say those are the cream of the crop that we are really monitoring to see what cool things are they going to come up with.

**[0:22:45.1] SC:** And if someone is listening and wants to get involved in the ambassador program, is there a mechanism for signaling their interest or they just get involved in the academy and do cool things and you'll find them?

**[0:22:58.0] SA:** No they actually can apply. So online at the academy, you can just search on Intel Nervana Academy online and you'll find it and then there's an apply to become a student ambassador and you can fill out what you are working on, why you want to be an ambassador and then we'll have someone follow up to do an interview and see if you're ready for that.

**[0:23:20.1] SC:** Okay, interesting. Sounds like the dev cloud is supported by some pretty interesting programs. In terms of the dev cloud itself, if I am an AI developer and I discovered the academy and dev cloud and have an existing tool chain instead of tools really that I am

using, will those work on the dev cloud or do I need to port what I'm doing to the Intel Nervana tool stack in order to use the dev cloud?

**[0:23:51.5] SA:** There's a really good chance that they will already be pre-loaded on the dev cloud. So the dev cloud is not just for specific frameworks. It's really for – first of all, the Intel Xeon scalable processor is our hardware platform and that will extend that when we have the new flavors of Nervana technology come out. So we'll keep building that hardware but on the software side, it's whatever software that will run great and that developers and students want to use.

So today, the dev cloud supports neons, works tensor flows, works cafes, works Diano, Keris, almost all of the popular frameworks and then Intel spent a lot of time optimizing them to run well on CPU. To go back a couple of years ago, the frameworks run great on GP – GPUs but not so well of CPU's. We've put a lot of investment over the last nine months or so and seen the performance improved up to a 100X on running those frameworks on CPU's.

So now we have optimized frameworks, pretty much the choice of the user gets to pick that and then he will get 200 gigabytes of secured storage area for his files and load up or queue up his project and then we'll run up in the batch mode and then he gets notified when it's ready and can do it again.

**[0:25:18.9] SC:** And so, I suppose there were no GPU's in the dev cloud.

**[0:25:24.2] SA:** No, they were not necessary.

**[0:25:26.2] SC:** And so you talked about some of the performance metrics that you've seen recently. These are for these 100X this improvement overtime. This is for training or imprints or both?

**[0:25:40.0] SA:** That's for training really and you know deep learning, first of all the vast majority of the servers that are running machine learning workloads are powered by Xeon platforms and Xeon servers. Deep learning is a subset and are fairly small but important subset of machine learning and that's an area where we have seen the software optimizations make a huge

difference on the time to train and so developers now are seeing what used to take months down to minutes to do training on Xeon scalable processor.

So we have the dev cloud will give you access to that. If developers haven't tried it lately, they should try it now and see really the great performance they'll get.

**[0:26:25.6] SC:** And so the 100X performance and the months down to minutes that's relative to past performance on the Xeon with CPU's. Do you have any published comparisons relative to GPU's?

**[0:26:41.4] SA:** I'll just note that a lot of it is based on the software optimization more than anything. That seemed to make some huge difference and we're seeing the folks in the industry now start to publish really good results on the training side as well compared to other alternative on the market. So I don't know that we have any yet published on our site but in general, we are seeing some really good results in the industry and then we are seeing really good results on cloud service providers and what they're using as well for the technology.

**[0:27:12.6] SC:** Yeah, you mentioned cloud service providers, is dev cloud hosted by Intel Nervana or have you partnered with one or more, the cloud service providers to make it available?

**[0:27:22.8] SA:** It's really part of a Nervana cloud and really aligning those together. For the service providers, AWS or Google cloud, they have great services today. They are using Xeon scalable and developer students can use those too, however it can become costly for a student just getting started. So this is a way for them to stand bucks and get started and then move into a CSP model when they have a business that can support that.

**[0:27:51.7] SC:** Okay, so then the Intel Nervana cloud that is something that you're building or built and are building and host in your own data centers and manage independent of the large call of providers?

**[0:28:07.8] SA:** That's correct.

**[0:28:09.2] SC:** Okay, great.

**[0:28:10.3] SA:** You know another thing that I will mention too is that Intel, one of the differentiators from Intel is we have such a broad portfolio of offerings and from the data center to the edge and the data center of course there is a training, there's inference on the Xeon but we also have the FPGA product mine and recently Microsoft announced that they're going to use the Stratix 10 FPGA for their brainwave project to really power all the inference in their DO platform and brainwave.

And we see a lot of opportunity with FPGA's as well both in data center and also at the edge for the inference piece.

**[0:28:49.4] SC:** Can you tell us a little bit about Brainwave for folks that missed that announcement?

**[0:28:53.4] SA:** Well I am not necessarily the expert on Brainwave but it is Microsoft's deep learning platform and they announced it is going to use FPGA and the Stratix 10 for because of the low latency, low power, high through quit it provides and the flexibility. FPGA is great in the flexibility it provides, AI evolves and changes that it can do that.

**[0:29:16.4] SC:** Okay, all right great.

**[0:29:18.1] SA:** And then the last thing I will mention too is if you are talking about the portfolio is we also have at the edge, we have people developing solutions at the edge for deep learning that use atom core processor Movidius for video processing and a whole host of this and all of this is going to be a part of the academy too. So developers can now learn about, "Okay I want to do the training, the inference and the data center but at the edge too and put full end to end solutions. "

**[0:29:46.3] SC:** Oh great, awesome. One question I've got for you is in your role as overseeing developer programs, there are some interesting differences between the needs of traditional enterprise developers and more data science users, data scientist that may also, probably also fall under developer programs for you. Can you talk a little bit about how the different offerings

you have that target these different communities and more generally like how you're looking at these communities and how you plan to evolve your offerings to serve both of them and give them what they need?

**[0:30:29.2] SA:** Sure and that is a great point. AI really introduced us to new types of audience for us because I ran developer programs for Intel and we cover the gamut from server to mobile and game developers and IOT developers across the board and we jumped into AI. Yeah, all of a sudden there is this data scientists and like, "Oh okay", we are used to maybe dealing more with C plus-plus developers and helping them optimize their code for the latest hardware that we have.

And for data scientists, it's a different ball game and first of all most of them were raised in Python. What we had to do is, "Okay, let's focus on how do we help them? They are going to be using frameworks, they need optimized frameworks, they need optimized versions of Python" they need to really understand the basics of machine learning and how to manage the data, how to apply machine learning versus how to really code in many cases.

So we really had to look at this differently and start to say, "Okay, for these guys let's teach them the basics on how to get started, let's look at the toolset they will need" like Python for example. We have Intel distribution of Python that is really good for performance and really good for AI and developers want –

**[0:31:49.1] SC:** An Intel distribution of Python? I've never heard of this.

**[0:31:51.0] SA:** Yes, it is a parallel of Python. Yeah, so when we tell data scientists about this too, they're actually really excited as well because it can really help the performance of their application.

**[0:32:01.4] SC:** Where do you find this Intel distribution of Python?

**[0:32:04.3] SA:** It's easy to find. You just search on exactly that, you'll find it. You will find it on our academy, we have lots of information about it there and the benefits.



**[0:32:12.1] SC:** And is it new kind as part of the academy or it's been around for?

**[0:32:16.1] SA:** It's been around a little while but it's not that long, I'd say last year I believe I will say that we rolled it out in 2016.

**[0:32:23.3] SC:** Interesting and you said it is optimized around parallel and distributed?

**[0:32:28.6] SA:** Yeah, particularly for parallel running really well on a parallel environment and getting the best performance out of Python applications.

**[0:32:37.2] SC:** And what's an example of a parallel environment and a workload that you might use this Python distribution one?

**[0:32:43.9] SA:** Well, I don't know if I have a real good example right there but let me tell you about an example that something we did just recently we just wrapped up because we did a contest with kaggle.com, we had to do it for another Kaggle patent and we said, "Let's find a partner in the industry who wants to solve a real world AI problem and they need some help" and so we partnered with Mobile ODT and they're all about early detection of cancer.

And how do they do that and how to provide low cost devices to early detect cancer and so they provided a data set of 10,000 images and we provide the developers with parallel Python with access. This was an early version of our dev cloud, we were in the pilot mode. So they have parallel Python, they have a dev cloud, they got in this case it was optimized café and we said, "All right, whoever can provide the best algorithms and become the best at the detection of the images that are cancerous will win lots of good prizes" and the response was great.

We had up to a thousand data scientists and developers competing on this and accessing the dev cloud on a daily basis. So it was a great test of this, it was a great test of the toolset and the whole model here and at the end of the day, Mobile ODT was really excited about what they learned and are now falling out the winners to say, "Okay how do we productize what you've done here together?"

**[0:34:12.5] SC:** Interesting. I think a lot of folks use Python from they'll use like Conda's or some of these other Python distributions like this. Do you envision partnerships to how do you get this distribution of Python out there, right? I imagine somebody don't know about it that a lot of people don't know about it and I mean I have seen this – yeah I think just based on other things that I have seen Intel do in the past like for example in Hadoop space, right?

So there is a ton of interesting innovations that have happened in taking Intel's deep knowledge of the hardware and kind of driving that into the mainstream Hadoop distributions, and making them out of the box, more performance based on, or more secure like there's some secure encryption stuff and a dupe example, you know, I know of examples where folks from Intel have partnered with you know, vendors like Docker and you know, other – lots of open source engagement but in this Python case, how do you get this out into the wild?

**[0:35:28.8] SA:** Well, a lot of that happens organically. You know, good product and there's a Python community out there which is quite active and they start to hear about it, the word will spread organically but to help that, we're becoming pretty proactive on awareness, striving just social media outreach.

Some digital online marketing and other academy awareness in general where Python is becoming a bigger message there that "hey, did you know this distribution is available and with these benefits." I think it's a combination of those and it won't be long before it's pretty well known within that community.

**[0:36:07.0] SC:** Interesting. Any other cool stuff to tell me about that I didn't know about?

**[0:36:13.0] SA:** I don't think so, I think we hit on the main ones, didn't think to mention is that the academy's growing fast, we already have, coming up on a 50,000 members and we've been running workshops around the world at universities, we'll have probably 200 universities that will be participating by the end of this year and trained about –

I think we're around 25,000 developers and students so far this year so it's really ramping up fast and we have some big aggressive goals really helping to bring AI to the masses and through the dev cloud, compute available to the training, have to learn about it, the technical

support with TCCS, we're pretty serious about helping people learn and grow and use AI to do really cool things.

**[0:37:03.2] SC:** Well, it's a huge growth opportunity so I think it's a smart move to make sense. It makes me think a little bit of apple's strategy back in the day, they get into colleges and universities with the Macintosh which helped propel them later on so congrats on that and congrats on the success of the academy so far.

**[0:37:25.2] SA:** Thank you very much. Thanks, so much guys.

[END OF INTERVIEW]

**[0:37:31.7] SC:** All right every one, that's our show for today. Thank you so much for listening and for your ongoing feedback and support. For more information on the Naveen and Scott, for links to dev cloud or the AI Academy and any of the other topics covered in this episode, head on over to [twimlai.com/talk/51](http://twimlai.com/talk/51).

For the rest of this series, visit [twimlai.com/aisf2017](http://twimlai.com/aisf2017) and please send us any questions or comments that you may have for us or for our guest via twitter @twimlai or @samcharington or leave a comment on the show notes page.

There are a ton of great conferences coming up through the end of the year. To keep up to date on which events we'll be attending and hopefully meet us there, check out our new events page at [twimlai.com/events](http://twimlai.com/events).

Thanks again for listening and catch you next time.

[END]