EPISODE 966

[INTRODUCTION]

[00:00:00] JM: Machine learning algorithms have existed for decades. But in the last 10 years, several advancements in software and hardware have caused dramatic growth in the viability of applications based on machine learning. Smartphones generate large quantities of data about humans move through the world. Software as a service companies generate data about how these humans interact with businesses. Cheap cloud infrastructure allows for the storage and compute of these high volumes of data.

Machine learning frameworks, such as Apache Spark, TensorFlow, and PyTorch allow developers to easily train statistical models. These models are deployed back to the smartphones and they're also used by the software as a service companies, and this improves the ability for humans to move through the world and the utility that humans gain from their business transactions. And as the humans interact more with their computers, it generates more data, which is used to create better models and higher consumer utility. The combination of smartphones, cloud computing, machine learning algorithms and distributed computing frameworks is often referred to as artificial intelligence.

Chris Benson is the host of the podcast Practical AI and he joins the show to talk about the modern applications of artificial intelligence and the stories that he is covering on Practical AI. On his podcast, Chris talks about everything within the umbrella of AI from high-level stories to low-level implementation details. Practical AI is part of the Changelog network of podcasts, so you know that it's going to be a high-quality, well-produced show, and I encourage you to check it out whether you have any interest in artificial intelligence or not. It's well done.

Also, I want to mention that we are hiring. We're hiring both a content writer and an operations lead. Both of these are part-time positions. The content writer position is for somebody who likes to write about software engineering and technical topics. The operations lead is for somebody who likes to learn about how businesses operate and is great at attention to detail. Both of these are part-time positions working closely with myself and Erica. If you're interested in working with

us, send me an email, jeff@softwareengineeringdaily.com. Don't be shy. I'd love to hear from you. And let's get on with today's show.

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[00:02:46] JM: Today's show is sponsored by Datadog, a scale, full-stack monitoring platform. Datadog synthetic API tests help you detect and debug user-facing issues in critical endpoints and application. Build and deploy self-maintaining browser tests to simulate user journeys from global locations. If a test fails, get more context by inspecting a waterfall visualization or pivoting to related sources of data for troubleshooting. Plus, Datadog's browser tests automatically update to reflect changes in your UI so you can spend less time fixing tests and more time building features.

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[INTERVIEW]

[00:03:54] JM: Chris Benson, welcomes to Software Engineering Daily.

[00:03:57] CB: Hey, thank you very much.

[00:03:59] JM: You host the Practical AI podcast. I'd like to start by focusing on that term, AI. So there was a term big data, and now that term has basically been supplanted by AI, and I think that there is, in some ways, no change between those two trends. But I think if you look at a technological level, there have been actual technological shifts that have come to the "big data" area that are significant enough to demand a change in terminology. Why not choose the term AI?

When you compare those two terms, those two eras of technology, what's the tangible difference between them?

[00:04:49] CB: Well, I guess I can offer my opinion, and the reason I start that way is that if you put a room full of people in the AI space, at least together, and ask them what is AI, you're going to get a whole bunch of different answers. Almost comically, I was actually at a Facebook broadcast that Adobe was doing about a year and a half ago and there were 12 of us that were being broadcast in a panel and they asked us all that and we all had different answers. We could agree on all sorts of stuff, but a bunch of AI experts could not agree what AI is. So I kind of lead off with that, recognizing that many listeners may not agree with what I'm about to say.

In my personal viewpoint, I have a fairly narrow definition of AI, and that helps me differentiate what it is from big data. I think of AI as almost a marketing term that evolves overtime. As technologies change over the years and our expectations of those technologies change, I think the term changes. The way I personally would define AI is I really think of it right now, in 2019, going into 2020, as synonymous with deep learning, which is implemented as deep neural networks.

So the way I would relate that over to big data is you can use big data in all sorts of different applications and different types of analysis, and if you're thinking of how am I going to operate on big data, you have an entire world of data science that you could apply to that big data. Then as a subset of that data science, there is machine learning, where you have algorithms that are self-learning that can operate and they kind of figure out what you have to do.

Then as a specialty subset of that is deep learning, where you're using specifically neural networks. To my way of thinking, deep learning equals AI today, and if you asked me a little down the line, I may give you a completely different answer.

[00:06:48] JM: There are some specific technologies that we could look at as hallmarks of this different AI era. We could look at frameworks like TensorFlow. We could just look at the growing volume of data from mobile devices. We could look at the growing accessibility, the growing adaption of the cloud, the drop in prices of the cloud. Describe the technology enablers that are making AI more accessible, or practical.

[00:07:23] CB: Sure. I think we've really hit an inflection as technology has involved, where several necessary ingredients have come together to make it possible. You've already called out

one of those, and that is cloud computing doesn't necessarily have to be at the cloud, but is essentially high-performance computing capabilities either in the cloud or that you have on the edge as a dedicated set of infrastructure. Because there's a lot of money these days, there were early benefits being seen back in the early 2000's as we've come out of the AI winter. So there's a lot of work on algorithms so that people can apply new techniques.

Finally, you mentioned a few minutes ago, big data, you have tons and tons and tons of data to operate on, and that's really – If you're defining AI as I do as deep learning, we see that today's deep neural networks require really massive amounts of data at a level that we just up until recently haven't really thought about in a practical manner.

So kind of going back to the national security agency as famously says, "Collect it all," from some years back. That's really what led to this wave of innovation that we're seeing in the AI space where you're able to take advantage of big data with these incredible algorithms that people are coming up with for various use cases, and we finally have the compute widely available to do.

As a matter fact, both the algorithms and the tools to use those algorithms, and in many cases, the data itself, depending on what your sources are, are either open source and/or free. So that's really made it accessible to a lot of people in a very short amount of time.

[00:09:10] JM: When I talk to developers, they generally seem more excited about these kinds of things, like building their own models using TensorFlow, training their own models to do things. There seems to be less excitement about the APIs, like speech recognition APIs, transcription APIs, image recognition APIs. You don't hear as many people talking about the usage of the APIs, which are so much easier to use. It kind of surprises me. Does that surprise you at all or is that consistent with your experience?

[00:09:51] CB: Possibly so. I think the APIs are great tools from the various vendors who make them available because they've already done the work of the model in their infrastructure. So they're essentially offering a model as a service to you through that API. What that does is it relegates it back strictly into the traditional world of software development where you simply make a cloud API call and you're able to get the answers you need, and that's great if your

interest is strictly on the business and if the problem you're trying to solve can be done with someone's existing API.

I think the thing that we're seeing that you're alluding to here among software developers, and that's my background as well. I'm not a data scientist by background. I'm a software developer. So there has been a rather unusual turn of events as we've gotten into the age of deep learning, and that is that if you looked before this recent, the last 5, 7 years, the rise of this as a field that is becoming so popular, you are really looking at more traditional data science and machine learning algorithms that were out there and to use those even at a fairly basic level. You had to have a fairly good understanding of how those algorithms worked. So that created a barrier to entry to their utilization. So it remains somewhat specialized in the data science world.

So prior to this modern deep learning moment that we're in, a software developer would work with the data scientist in many cases to say, "Hey, can you create the algorithms or can you show me how to use those and we'll work together to get that to work?" Well, something pretty interesting has happened in the deep learning world, and that is that there is the notion of transfer learning in deep neural networks, where because deep neural networks in their layers build upon each other.

As a brief aside, which I think is important to understand why this is the case. A deep neural network has a bunch of layers of nodes or neurons that they have relationships with other neurons beside them, and that creates abstractions on what different concepts in the real world. They're essentially mapping various types of abstractions. As a simple way of thinking that, if you think of your face as an abstraction, as a concept, and it's made up of the concepts of eyes and concepts of nose and concepts of mouth and such as that, then you're getting these collections of concepts that create something bigger. Then that also might go in with other things to create something even larger, like a human; face, torso, arms, that kind of thing.

The neat thing about transfer learning that I was mentioning a moment ago is that it turns out that you can reuse much of a model by only keeping a certain percentage of the existing train layers. So you can have a company out there like maybe one of these leaders, like Google, or Amazon, or Microsoft that are out selling these services and they may have models that you can reuse without all the intense training needed from scratch.

So not everybody is a research scientist in AI that has to go create a solution from scratch. If you can go use somebody else's model and say, "That works for a lot of what I need. I just need to build a little on top of that," then you can gain the benefit of transfer learning and utilize it for yourself.

So going back to your original question about developers, that's an ability to create new things that APIs are not offering and it's not that hard or technical. A software developer can fairly easily level up to take advantage of that, and that opens an entirely new world of capability that they never had before.

[00:13:39] JM: How has "AI" changed the dynamics of modern warfare?

[00:13:44] CB: Well, I think we're going through a transitional period right now where you have the Department of Defense here in the United States, along with its vendors in the defense industry. I worked for one of those Lockheed Martin. As we look at the fact that potential adversaries out there, often people will note Russia and China as potential adversaries out there and they're saying, "Hmm, how do we always stay strategically safe? Able to provide the national security the mission that has been specified for the Department of Defense?"

So if you have AI as a set of tools out there throughout the world in all industries, obviously, it's also going to have applicability in this industry. As you look at more and more technology basis for national security missions, you're going to see that if you can handle faster and faster issues out there as the speed of conflict is constantly increasing, AI can play roles of being able to supplement and interact with humans that are the primary drivers of those missions to give them capabilities or speed up existing capabilities that they've never had before. Of course, anybody, just as in any other industry, anybody in the defense industry is going to be saying, "How can this particular toolset help us better achieve the mission that we've been assigned?

[00:15:16] JM: Let's say I make you the US director of AI policy. What would your policy be on facial recognition technology?

[00:15:27] CB: Well, I think first of all, the person that was closely matches that would be a man by the name of Gen. Shanahan who is the leader of the Department of Defense's joint AI center,which came into existence last year. Those are the kind of questions that they are trying to answer. If you're looking at the capability of machine vision or any of the other common types of use cases, then you're trying to match up mission requirements that you have and the various tools that you have to implement those missions and saying, "How can these different technologies, such as convolutional neural networks, improve my ability to fulfill a mission?" So that is literally how that is analyzed. As a strategist at Lockheed Martin, we have a number of people such as myself that are working on these types of questions and trying to find the answers for that, which it's still a work in progress. For the moment, I'm not going to get out in front of the Department of Defense, because there's a lot of joint effort in that.

But we have to look at these technologies and say, "Where does it make sense both from a technical standpoint in terms of how it improves mission capability and also from – Which is a great concern to the public at large and us, is the ethics of AI obviously."

So that is literally something that I am working on at Lockheed Martin. I'm one of the people that drive that effort, and eventually we'll probably be able to talk about that in public. But right now, the work is still being done and we're still working with DOD and other federal agencies on what we consider to be appropriate uses of those technologies.

[00:17:04] JM: But let's say I'm not asking you as somebody who is familiar with military technology and military policy. Let's say I'm asking you more from the kind of world you want to live in or the kind of United States that you want to live in. For example, should I be able to walk into a store and have a security camera monitoring my face and allow me to pay by just walking in and then walking out? Should there be cameras everywhere so that I have a sense of safety as I walk around? And I know that there is a constant scanning of faces for potential miscreants or people who might cause me harm. What about on the consumer level and the population level?

[00:17:54] CB: Sure, and I think that's one of the challenges that we have right now, and I think that is a very hard question to answer. I'm certainly open to offering my own personal insight. I think for me it really comes down to disclosure. Obviously, I wouldn't be in the AI field if I wasn't

enthusiastic about the technology, but it also brings about these capabilities that definitely affects things like privacy, perceptions of the world. How we're engaging with those around us?

So I think we're at a moment right now to where if you're going to make those steps forward into this to use artificial intelligence to fulfill those types of use cases in the consumer space, you need to make sure that your partners and that your customers fully understand that that is part of the engagement that they're going to have with you.

So I think where consumer organizations get into trouble is when they kind of a leap ahead of where the people that they're serving are expecting them to be. They don't give those people a chance to opt out or to give feedback saying, "That doesn't work for me."

I don't think there is a single answer that works for everybody so far with – I'm both enthusiastic personally about AI and I have great concern working in this field about the potential for privacy to be violated, but I also know people that whether or not they have any interest in AI, they want to maintain strict privacy and they're trying to figure out how to use even the tools that are out today where you have social media tools that are able to predict your behavior, your likes and dislikes, even better than your own cognizant awareness allows.

So it's a fair thing to say that a social media site literally knows more about you than you do in the sense that they have objectively observed certain behaviors and that we are emotional beings and we tend to want to think of ourselves in a particular way, and we may not be very honest or observant about how our behavior is leading.

So it's such a complex world, and one of the things I'm always telling people is these are the conversations that we need to be having. Literally, everyone listening to this right now needs to think their way through what their own positions. What works for you and what doesn't work for you and are you ready as you engage consumer companies to be able to kind of stand up for your own set of beliefs and your own set of interactions at a level that you're comfortable with? I would argue that probably most people have not taken that very active a step yet.

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[00:20:40] JM: Looking for a job is painful, and if you are in software and you have the skillset needed to get a job in technology, it can sometimes seem very strange that it takes so long to find a job that's a good fit for you.

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[INTERVIEW CONTINUED]

[00:22:30] JM: Many of these conversations that I have seem to devolve into a very emotional conversation. So for example, the conversation around should you have a voice interface in your home? The first response that I almost always get from somebody who I'm talking to about a voice interface and whether or not they should have one is, "I don't want that thing. It's listening to me all the time. I'm not interested."

The smartphone does the same thing, and if you bring that up to these people, at least in the examples that I've had, they basically get a cognitive dissonance and they cancel the conversation. They're like, "Yeah. I don't really want talk about this."

If they were to zoom in a little bit further, like first of all, there's no difference. Second of all, if there's any difference, it's that the hardware is more secure and you're not installing random third-party apps on to your smartphone device. Furthermore, it actually provides a ton of utility. So as somebody who spends so much of their time talking to people about "AI", how do you navigate these issues that have become so sensitive to people?

[00:23:52] CB: I do the same thing that you just said, where I tried to point out the deal, if you will, that people have already signed up for. A lot of cases, not very thoughtfully, not very cognizant of the implications.

I personally carry around an iPhone. That's my personal iPhone. I carry around an iPad, my personal. I also have a work iPhone that I'm assigned. We have our laptops in my house. I have Google devices. I have Amazon devices and all of these have various listening capabilities, and they're all – They can all be turned on remotely and it's something that I personally am very, very aware of. I know that in finding my own choice of where to accept the tradeoffs between privacy and utility with these devices, you can, in some cases, go in to the settings and decide, "No. You're not allowed to upload data." That might be default setting on, that kind of stuff.

So in our family, we're a little bit thoughtful about the fact that there are many microphones around and, just technically speaking, aside from the legal and regulatory constraints, that a lot is possible. Then when you not only think about the fact that you have all these microphones and all these input devices, cameras around, that data can be used in many different ways. Some of them you might think of very wonderfully, and others quite nefarious.

You just have to – If you're going be thoughtful about it, you have to accommodate that realization in your life, and it takes a few brain cycles to go through that, which is probably why most people turn away from it. But that is exactly why if you work in the defense industry or if you're in the military or DOD and you have any sort of classified access, then you literally have to leave all of your electronics out when you have those kinds of meetings and stuff, and that is

why. Because if you do have a nefarious actor in there, whether this'd be in the military space, whether it'd be in the consumer space, wherever, that technical capability exists. So you should be aware of it.

[00:26:07] JM: When I think about the government's use of large data or "AI", it seems so nascent. I mean, we can talk about AI, but the amount of data that the government has relative to how much use they are making of that data, even in just like noncontroversial ways, like, can I get a passport faster or something? Can we build roads more efficiently? These kinds of things are not really – I mean, slowly but surely, I'm sure we'll get them.

But I think in some ways, this mirrors the ways that legacy enterprises are like talking about their AI strategy, but largely there's almost no difference between – For many large enterprises, there's almost no difference between an AI strategy and just like a data platform strategy. Just getting your data in order, cleaning your data, making very simple regressions based off of that data. Are we even at the stage where enterprises can build useful models? When can they build useful models? Are enterprises just kind of figuring out how to get their data in order or are they actually building models that are helping them in transformational ways?

[00:27:42] CB: I think it depends on the motivation, obviously, of the people in each organization on how they're approaching it. For-profit businesses are out to make a profit, and I think it would be naïve to think that they're going to use data in a way that is not to further that goal. That's why they're collecting it. That's what they're there for, and that would include obviously all the cloud companies.

I think the place where those kind of organizations get into trouble is when the people that they're serving don't have a clear understanding of how that data is going to be used and have not given their consent for data to be used in that way. I think that is different from nonprofits and government agencies because they are there to serve the public or serve the constituencies that they have. I think that, presumably, if a nonprofit is in fact able to secure their 501(c)(3) designation from the IRS, it means because they have been deemed a public charity and therefore the public good, and hopefully they're operating in that manner.

But just be aware where those interactions are and, specifically, don't give consent to use data unless you're fully cognizant of how those organizations are going to be, because they can learn about you and your various behaviors that may influence their for-profit operations. If you're okay with that, then go ahead and do that, and I've had to consider that myself, recognizing that by opting into certain social networks and search companies, that I know they're going to use that data and they're going to mix it with other people and try to get not only views of me as a person, but also larger societal views that can further their business. You really have to just recognize whether or not you want to be part of their transformation process.

[00:29:36] JM: What's the most creative application of generative adversarial networks that you've seen?

[00:29:41] CB: The most creative. I would say we're still trying to figure that out right now.

[00:29:45] JM: By the way, I'm not telling like creative from like, "I got a GANs to write me a movie script or something." I just mean like from a technical perspective.

[00:29:53] CB: Well, I mean, I don't even know that it's the technical perspective that's the most interesting. It is a particular approach to model development, and we may want to find that, where you have essentially, in layman's terms, you have one model that is generating possibilities and you have another model that's kind of discriminating what's real and what's not. In that feedback loop, let them together as a team produce better and better content towards whatever that end goal is.

So there have been some pretty amazing areas in terms of music creation that I've heard, in terms of artwork. You probably are familiar with the fact that there was a group somewhere in Europe. I don't remember the specifics. But they had created a painting, probably about two years ago now roughly, and they were going to sell it at Christie's Auction House.

I think that roughly they were thinking it might go for something like 10,000 American dollars. It ended up fetching somewhere in the neighborhood of half a million at the end, potentially because it was the first of its type to use GANs in this kind of big art way. I don't know how that would affect pricing going forward, but it was interesting moment, because it was the moment

where we first realized with some of these innovations that we're literally in the world of art that, yes, AI can be creative. Yes, AI can generate things in an artistic sense that we had up till that moment reserved for human intellect and thinking that would be the last bastion of where humans would be dominating for some time to come.

So now that we understand that AI has a creative ability in the model itself, it creates where do we want to go with this? There're a lot of ethical issues. What is valid to create? How does that interoperate with humans? It can be great for simulations. The sky is really the limit on the technology. So I know that myself on the Practical AI podcast, my cohost, Daniel Whintenack, we are eagerly watching what happens week after week and month after month. I think kind of calling out some of the more novel things that we see along the way.

[00:31:56] JM: Okay. But that piece of art, that was not actually like a milestone in like computer creativity. I mean, computer creativity, you can say some AutoCAD design or some data visualization, like a really nice line graph. There's really not much of a difference between that and a work of art created by a GANs.

[00:32:25] CB: I'm going to disagree with you right there, and I'll tell you why. I don't even think it's what is the actual output itself. I think it's the fact that if you're going to open up a CAD program and work on it, it's still requiring the creative element. That provides tools for you to use to realize this vision that you as an artist may have. But at the end of the day, it's not the CAD software is only enabling this thing that you have in you as an artist. What GANs have done in this concept of creating this painting and things that have come subsequent to that with music and with photography and everything is that it's no longer arising out of ourselves as humans.

I actually do think not because of the technical output, but because of the source, it was truly a touchstone moment for humans more than AI, and that this thing which we always expected to be the last thing to go to computing was there already.

So we've had to kind of readjust and go, "Hmm, that thing that I thought we'd hold in reserve is different." It affects humans in a fairly deep way in that way. If you're looking at it just about the technical output of the art itself, I can totally see your point.

But it is change what may happen. For instance, in the creative worlds going forward at this point, if you're a marketing agency and you have a client, do you have a staff of designers going forward that are creating the novel things that you're trying to sell a Fortune 500 company in terms of branding and in terms of the various marketing campaigns, or do you have a bunch of supercomputers that are running thousands of GAN instances and generating ideas? Whether they be music, or imagery, or stories and dialogue, whatever, that you're going to turn around sell? I think it's actually a really big moment.

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[00:34:27] JM: As businesses become more integrated with their software than ever before, it has become possible to understand the business more clearly through monitoring, logging, and advanced data visibility. Sumo Logic is a continuous intelligence platform that builds tools for operations, security and cloud native infrastructure. The company has studied thousands of businesses to get an understanding of modern continuous intelligence and then compile that information into the continuous intelligence report, which is available at softwareengineeringdaily.com/sumologic.

The Sumo Logic continuous intelligence report contains statistics about the modern world of infrastructure. Here are some statistics I found particularly useful. 64% of the businesses in the survey were entirely on Amazon Web Services, which was vastly more than any other cloud provider, or multi-cloud, or on-prem deployment. That's a lot of infrastructure on AWS.

Another factoid I found was that a typical enterprise uses 15 AWS services, and one in three enterprises uses AWS Lambda. It appears serverless is catching on. There are lots of other fascinating statistics in the continuous intelligence report, including information on database adaption, Kubernetes and web server popularity.

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[INTERVIEW CONTINUED]

[00:36:17] JM: Just to drill into this a little bit further. So the AutoCAD example, with AutoCAD or with data visualization like an Excel model, you're often drawing relationships between data points using interpolation and then you are saying, "Okay. Based off of this set of data points and the interpolative relationship that I have described to you, computer, please extrapolate beyond this model that I have described to you."

Then the computer has been able to do that for a long time. I mean, our interpolation extrapolation has gotten better. The only difference with the GANs stuff is you're saying, "Hey, here are some works of art, and here are some parameters that I'm going to define that I want you to look at those works of art in terms of, and here's the interpolative relationship I want you to think about between those works of art based on those parameters that I have described to you. Now please extrapolate from that relationship," and it's really just the same thing. I mean, I think it's great. I think it's wonderful, but I think it's just iterative.

[00:37:37] CB: I do agree. It is iterative in one sense, but I think the thing that distinguishes the two is that in the case of the first where you're using software as a tool as a human, you're still talking about the kernel of that creative vision came from the person. They came from the human.

As you look at model-generated art, and it doesn't have to be art, by the way. It can be all sorts of different task in the world and stuff, then you're looking at a capability coming about where you didn't have to start with an artistic talent in a human from the origin of that. As we're looking, as you start multiplying this new capability in the compute world out across many industries, that's why we're arriving at this moment now where we have to decide what is this relationship that we're going to have with computing, since in many cases that nugget of creativity, that nugget of insight, did not start with a human. It started with a model somewhere.

If you run that out on any given industry and you say, "Well, we're going to proceed down the –" It may be that instead of building on the shoulders of human giants, you may be building on the shoulders of model giants, which is why we us as humans need to start rethinking how we interact with AI going forward. What is the right relationship? Because it will change the business models.

If you're a business person out there and one of these companies that we were just alluding to a few minutes ago with a profit motive, then you have an option between do I use humans for this going forward or do I use models for this going forward or some mix of the two? If it's a mix, what does that mix look like and what are the moral, ethical considerations that we need to apply to those as well just as organizations and citizens of the world at large?

So I think we're in a moment of really trying to figure out a lot of the implications where we may be starting small, and I think you kind of pointed out that that's that evolution, but you also crossed the line in that evolution that's led to a whole bunch of new things coming in the world before us.

[00:40:04] JM: Yeah. I mean, whether or not it's iterative, whether or not there is a total adjacency between somebody building an Excel model and defining the parameters in their Excel model versus somebody defining an art generation model. Whether or not that is discrete or continuous relationship between those two paradigms, I do think that whatever watermark we crossed recently, maybe it was literally what you're describing. We've crossed some indefinable moment in computer-generated creativity, or maybe it's just we could define it in terms of just the amount of applications of interpolation and extrapolation in "deep neural networks" and these other things that are from one point of view just iterative, but you could also say like, "Well, we're basically just – We've just iterated beyond vacuum tubes."

I mean, it's clearly like there have been significant inflection points in the roadmap from vacuum tubes to multimillion dollar Christie's art sales from AI generation. I do think that something really significant has happened recently and there's just so much going on and I think that's what your podcast covers.

You do have a mix of the technical and the cultural, and I think that's important because there's a lot of people who sit between – I mean, everybody experiences the cultural impacts of AI. Everybody's experiencing this on a day-to-day basis, and the technical elements, people have varying degrees of fluency with it. People have varying degrees of desire to attain that fluency. I think by exploring both of those sides of AI, you are covering a lot of ground.

Why the name Practical AI? Of all the adjectives that you could have chosen, why Practical AI?

[00:42:16] CB: So we kind of backed our way into that, to be perfectly honest, and it came with the vision on it wasn't even specific to the podcast, but the vision on what Daniel and I wanted to do in the world in this arena, and that is there are so much hype around AI. Once upon a time, it was the kind of thing where when you read technical articles online or back when things were still in paper magazines and stuff, you'd see it there. But if you look at the last five years, you go back 10 years ago and it was very rare that you would have AI in the media that you would watch you CNN or Fox or whatever your preference would be and see a regular set of stories. But we are now in an age where it is just normal mass media conversation.

With that, there is a lot of hype and there is a lot of marketing that goes with that, and there's a lot of misinformation on what it is at any given point in time. So when Daniel and I, we were already friends and we came from the software development world actually where we got to know each other. But in this AI space we said, "We've been learning and we're recognizing that there're a lot of misunderstanding and misinformation out there. Why don't we help ground people? Why don't we help provide a medium where people can come and just see what it really is? What are the real capabilities and what are – Based on those, even without the hype, what is the implication to the world around us and society of those technical advancements that we're seeing?"

Much like this conversation we're having right now, we want to have this conversation with the entire world, if possible. So we deliberately chose to make it practical in a sense of its both practical. It's very accessible to people. I commonly say, if your grandmother wants to learn about AI, they should listen our podcast, because we do talk about technical topics, but we take the time to define the jargon along the way so that anybody can understand it. In doing that, it makes it productive in their lives even if they're not an AI person, even if they have some job that is in their minds very different from AI and they just would understand what is this thing and how it would affect their lives? So we like to say that we make AI practical, productive and accessible to everyone, and that's why, that very practical, connecting you and your life, whatever that life is, with this thing that's out there changing the world in a lot of ways, but often not the hyped ways that people are worrying about.

[00:45:03] JM: All right. We're nearing the end of our time. I got a couple of more questions for you. Let's say I give you $2 million cash. No attachments, except you have to leave your company and you have to start an AI company today. You have to spend at least a million dollars building that company. What would that company be?

[00:45:26] CB: Honestly, there are so many opportunities. The real answer I get people asking me on a regular basis, do I want to go to other organizations or create new companies from scratch? I'm in Atlanta and I participate in Atlanta Startup Community. We actually host an AI meet-up at the Georgia Tech Incubator. So I have that opportunity and I have these conversations. I don't have one that I see. I can think of so many, and I don't know what's right for me right now.

But to be perfectly honest, what the kinds of work that we're doing at my current employment, which is Lockheed Martin, is just so freaking cool, that I honestly don't want to go do the startup right now. Maybe someday, but right now I am so busy learning and seeing what's possible at a company that is pretty quiet about its AI stuff because of the industry it's in.

But we have so much cool stuff out there that it really puts us in that top tier, and very few people are aware of that, that if I get to a point where I'm not learning anymore and things aren't moving and I don't feel that, then maybe I'll consider that. But there are big problems in the world that AI can be a component to solving. Some of those include medicine and healthcare, which I'm keenly interested in. One of the things that I love doing is animal advocacy, animal rescue type stuff, and I started a nonprofit to do work with AI and other advanced technologies in animal welfare, animal advocacy type issues, because there wasn't the profit motive.

So for the moment, staying at Lockheed Martin for the foreseeable future, learning is much as I can. Taking my spare time to use these technologies to save animal lives as an animal lover, and then maybe someday if the time is right I'll look elsewhere. But they're just so many opportunities. I would challenge you. If you're in farming, there AI capabilities in farming and things that you would never normally associate with AI using CNN's to look at crops and give them just the right amount. That's not even new. That's not cutting edge. That's been around for several years. There's really not an industry out there that you can apply this technology to in an

incredibly productive way. So it's really pick what your passion is and then say, "How can I take this great toolset and utilize it in that way?"

[00:47:47] JM: Last question. What's the difference between podcasting and journalism?

[00:47:52] CB: That is a very, very good question. So I guess it really is – You can podcast and you may or may not be a journalist, and sometimes I feel like an amateur journalist too with podcasting and sometimes I don't. Really depends. For me, it changes day-to-day. Not sure what the right definition. I feel like the journalist at least I tend to associate with, kind of the classical news person who is objectively trying to get to the truth of everything and that you can count on their objectivity. I will confess that I don't always do that myself as a podcaster. Maybe I'm not bound to that level of kind of searching for the facts.

I think I probably am more the conversationalist and I just like talking to smart people who are doing really cool things. Not sure that would rise to the level of what I think of as journalism, but I know I have a whole lot of fun doing it and hope to continue for some time.

[00:48:50] JM: Cheers to that.

[00:48:52] CB: Thanks a lot.

[00:48:52] JM: Thank you, Chris. It's been great talking to you.

[00:48:54] CB: You too. Thank you.

[END OF INTERVIEW]

[00:49:05] JM: If your product has dashboards and reports, you know the importance of making those analytic products beautiful. Logi Analytics gives you embedded analytics and rich visualizations. You don't need to be a designer to get great analytics in your product. According to the Gartner Analyst Firm, the look and feel of embedded analytics has a direct impact on how end-users perceive your application.

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