

Rashmi Mohan: This is ACM ByteCast, a podcast series from the Association for Computing Machinery, the world's largest educational and scientific computing society. We talk to researchers, practitioners, and innovators who are at the intersection of computing research and practice. They share their experiences, the lessons they've learned, and their own visions for the future of computing. I'm your host, Rashmi Mohan.

You can't be what you don't see. There is nobody who lives by that quote more than our next guest. An inspiration, a role model. Dr. Nashlie Sephus is a computer scientist and an expert in artificial intelligence. Having been a beneficiary of strong mentorship and guidance, she pays it forward on a daily basis. Dr. Sephus serves as a technology evangelist at Amazon Web Services AI, where she works on eliminating bias in machine learning models. She was CTO at Partpic, a technology startup working on visual search that was eventually acquired by Amazon where she led the visual search and AR team as an applied scientist until recently. She's the co-founder and CEO of Bean Path, a nonprofit organization committed to transforming Jackson, Mississippi into a tech hub. Dr. Sephus is also a prolific speaker and was awarded the Ada Lovelace Award in 2019. Nashlie, welcome to ACM ByteCast.

Dr. Nashlie Sep...: Awesome. Thank you so much for having me.

Rashmi Mohan: Entirely our pleasure. I'd like to lead with a simple question that I ask all my guests, Nashlie, which is if you could please introduce yourself and talk about what you currently do and also give us a little bit of insight into what drew you into this field of work.

Dr. Nashlie Sep...: Absolutely. So I'll say by day, our principal AI scientists at Amazon and my team focuses on responsible AI. So we do a lot of testing evaluations on all of our AI models for all the different web services or cloud computing offerings that AWS has, which is a lot. And so it covers areas like NLP, voice image, video, also texts, time series data, so many different types of data and different applications that people are using our services for. So we have to make sure that we understand all the use cases as much as possible and we're being transparent about how well it works. And so I say by night and weekends, I'm a CEO and founder of a nonprofit based in Jackson, Mississippi that's doing some amazing work in the community to help people get access and exposure to tools, knowledge and the network to help strengthen that tech ecosystem and bridge the tech gap in places like Jackson, Mississippi where we're based.

Rashmi Mohan: Fantastic. You'd have to tell us how you have more than 24 hours in a day to do all of this. We're all seeking that answer, but it's so fascinating to hear about your work and we'll talk more about that. But what I'd love to hear, Nashlie, is why the interest in computer science? What brought you into it? I know that you got into it when you were in middle and high school, so what was the motivation?

Dr. Nashlie Sep...: Oh, man. I remember just really being interested in math growing up. That was always my top performing class. I also was a musician, played the piano, played percussion, and so there's a lot of math actually involved in being a musician. And so I believe that along with my upbringing, I always say I grew up in a house full of women, and so my mother, my grandmother, my sister, we all had to be very hands-on with things. So there wasn't like a man you could say, "Hey, take the trash out." We had to take the trash out ourselves, we had to mow the yard, and we were doing things like changing ceiling fans, and I just remember all that hands-on work, it really made me interested in how do things work and how do we fix them because money was tight, so you can't always call someone to come and repair things, so sometimes you just got to do it yourself.

And so I really believe that that led me to an interest in something I didn't know what it was called until the summer after my eighth grade year, my eighth grade teacher, she sent me to this engineering camp for girls. It actually was at the time sponsored by the Society of Women Engineers and it was located at Mississippi State University where I ultimately ended up going to undergrad. And I remember that it was just amazing. It just blew my mind and all the things you could do, learning about all the different types of engineering, especially computer engineering, which is a little bit of both of electrical engineering and computer science. And I thought it was so cool how you could type these letters and numbers into the computer and it could control pretty much anything. And little did I know that eventually the world would run off of these computers and computer programming language, but it was just fascinating to me at the time.

Rashmi Mohan: That's amazing to hear, Nashlie. I was reading a little bit about your background, and I mean in terms of your bio, and I know in your free time you said you liked to DIY and I was meaning to ask you where did that interest come from? And now it's pretty obvious. I mean, I think hands-on experience, whether that is just by need or by interest, it's possibly the best way to learn about how things work and truly a mark of an engineer. I also find it very fascinating that you talk about math and music because one of the things that I also read about was that your PhD dissertation was in a field, and I think you worked on digital signal processing in music data mining. That's not very common for a computer scientist either. So I'm very intrigued by that and I would love to hear, and love for our listeners to hear about how did that come about? Why did you pick that topic? What kind of key problems did you encounter while working on your PhD?

Dr. Nashlie Sep...: Oh, wow, you really did your research too 'cause no one speaks about my dissertation. That was so long ago, but you're right, it was like a culmination of my music background and signal processing at the time. Digital signal processing was like the core and the basis of machine learning and how do we extract these features out of signals and be able to better recognize what's in the signal without having to actually hear it or actually having to interact with it. I remember at this time when I started grad school, I was actually really into the Shazam app. I thought it was so cool that you could use that app and listen to

any song and it could tell you what the song was. Now at the time, this was brand new. It was like this wasn't anything anybody was used to. And I said, "Wow, how does this thing work?"

And I found out it's based on pattern recognition and machine learning and information retrieval and music signals. And so that's what I was interested in. And so at this time, I was starting grad school at Georgia Tech. I needed to pick a topic so all the grad students out there understand that is a very daunting process sometimes. But I had to just go with my passion. I mean, I have to do things that I believe in, do things that I'm passionate about because that's what keeps me motivated, especially when it gets tough. And so if you know anything about getting a PhD, especially getting one at Georgia Tech or any top engineering school is very difficult. It's not for the faint or the weak, and I think it really made a stronger person out of me to go through that.

But because it was focused on music information retrieval and getting, figuring out how to use frequency analysis to understand what's in an audio signal and also how do you separate these different sources, we call it source separation in the signal processing world, and how do you take that and be able to make emphasis about those types of signals in the future. And so that was what my thesis was based on.

Rashmi Mohan: There's definitely so many lessons in there, Nashlie, based on what you said. One is getting a PhD is not simple. A large part of your PhD time is spent on trying to determine what problem you want to solve. The second thing is around passion, picking a subject that you're passionate about so that when you have really tough times, you can really lean in and say, okay, I really enjoyed this subject and so I'm going to stick through this hard part and try and get through to the other side. So it's pretty amazing that you were able to combine those two and find and have the grit to be able to work through that process and really enjoy your graduate school journey. So that was probably the introduction to just moving towards AI, and I'd love to see how did that translate into talking mostly about bias, but also I'd love to understand what was your journey. So let's start from there. What happened after the PhD?

Dr. Nashlie Sep...: Yeah, so actually even before I finished the PhD AI machine learning, it actually wasn't even referred to as AI as much at the time, but machine learning pattern recognition, those same techniques that I would apply to audio signals and music signals, you could apply to speech, you could apply to video, you can apply it to images. It's just adding more dimensions to the data set, but the techniques are actually the same. And so when I found that out, because I had to do other work for my PhD, I did work in all those other areas including even brain signals. So it's just amazing how it's all math at the end of the day. The data, once you format it the correct way, is exactly the same math to find those patterns and different techniques that you can find that work better for some types of data than other types of data.

And that's when machine learning was born. And so somewhere between me finishing my PhD and starting to work at the startup company, I figured out, started doing research and learning more about the different Gaussian mixture models and the large image models that at the time, ImageNet and some of these other algorithms, convolutional neural networks were reborn and these things were reborn. A lot of people credit this to Professor Yann LeCun and his research, and I believe that he was able to basically find a way to train these models a lot quicker than what it used to take. And so now when you have quicker training, you can also train something on your laptop. You can do it. At that time, we were training simple, smaller scale models. It would take days, it would take almost a week. Now, fast-forward to now we can train simple models within minutes with the computational power that we now have and also moving to the cloud.

And so before even some of the work that I did in grad school, we had a server in the lab, and that's a thing of the past, at least at this time. Now you have so many computational power in the data centers, whether it be AWS or Google Cloud, that you can now process things a lot faster. And so those two things together, speeding up the model and also being able to have processing power that wasn't necessarily local, if you didn't have access to it, you can also get it on the cloud, those two things really sped up the research of AI. And so now you start to see all sorts of applications that are not just in the journal publications, but they're in the consumer world too. And so it's pretty remarkable when you look at that whole journey of how we got to where we are now with AI and even improved interfaces that makes it where my grandmother can literally use AI.

Rashmi Mohan: Those are very, very valid points, Nashlie, what you're talking about. I think eliminating the infrastructure issues as well as the processing speed and then the speed of the models themselves allows you to focus on solving these applied problems that are real world issues that can be then provide solutions for consumers. How did you get into the, I mean, we'll talk about your startup in a bit, but how did you get into particularly interested in eliminating bias in AI? So we talked about datasets, we talked about the ability to process them in a much more expedient manner, but I know that you are particularly interested in eliminating bias. You've spoken about say personal experiences with products not working well for you, was that a motivation? Would you care to elaborate?

Dr. Nashlie Sep...: Sure, sure. So I do have a quick story. So when you think about biases in technology, and one of them, I remember back in, I think it was around 2008, 2007, I was finishing up undergrad. I was doing a longer internship in between undergrad and grad school. I actually was working at Delphi as a company that designed the Bluetooth radios in the Toyota Camrys and some of the other car systems. And so we would have to test the voice recognition because back then we used to have to dial numbers by speaking them into the microphone in the car system. And so they would always use my voice to test the system because I had a southern accent, and this was in the Midwest at the time. And so it would always get certain numbers wrong when I would say them.

And so they would literally use me to test the system that I was working on. It was pretty funny, but I was like, yeah, this thing is pretty much useless to me if I can't understand certain numbers, I can't literally dial my own number or dial my home number or my mom's number. And so it really makes you think back to when people design these systems, who do they have in mind? And so it's come full circle now that I focus on responsible AI and fairness and evaluating biases, unwanted biases in AI now even at Amazon as a scientist there. And that actually came about during 2019 when I was actually switching from one team over to another team that now focused on face technologies. And at this time there was a paper called the Gender Shades paper that pointed out some of the disparities in some of these commercial algorithms and services, including Amazon.

So I was called to that team to investigate and help, which we were able to mitigate those biases and disparities in certain groups and also understand what was causing the bias. And so it actually was something that we didn't even expect. It was actually hair length. So it can be things and biases and systems that you wouldn't even know to test for, and there's a methodology that you use to actually go about how you evaluate systems. And so we were able to improve upon that system and that process and then take that same methodology and apply it to all of our other systems. So at the time, we focused on this team, and then we built a team that focused on all of the products as a whole. And we were able to move forward, building more methodologies, which now today we focus on many different, we call dimensions under responsible AI, including fairness, transparency, governance, explainability, robustness.

There's also how do you check with the age of generative AI now, how do you check for veracity and against hallucinations and copyright information? And so there's so many things that go underneath that umbrella. And back then all we were concerned with was security and privacy in terms of even cybersecurity. But it's a whole other realm now that we have to understand that we make sure that we look into and how do you hold these companies accountable for these products, not just the large ones, but the smaller startups because one day those startups are going to be bigger companies too. And so working together with consumers, with public policy, with government, we can figure out how to better enforce and regulate these technologies like appliances.

Rashmi Mohan: Yeah, no, absolutely. I think I also found it funny though, you were talking about the Bluetooth radio in your car. I mean, it's such a testament to having a diverse team and building products for, I mean, having you on that team very quickly helped them identify that the product was not built for everybody, which is fascinating. We talk a lot about diversity, but I think this is such a key example to show the valid, the need for us to have a group of people who are building a product that actually have very different perspectives.

Dr. Nashlie Sep...: Yeah, absolutely.

Rashmi Mohan: I would love to hear more about when you talk about responsible AI, Nashlie, you also spoke about the fact that we need to have governance around this. So in terms of, I mean, one, you work for an organization and obviously you're building tools to help eliminate bias within your own products. Are you also involved in more of an open consortium where you are starting to define the guardrails for responsible AI, and are you seeing interest from other groups and other organizations as well?

Dr. Nashlie Sep...: Oh, yeah. There's so much interest now, and a lot of it is credited to that paper, Gender Shades, the authors Joy Buolamwini, Timnit Gebru and a lot of the work that was done in that timing with her organization, the Algorithmic Justice League. We also have an organization called Black NAI that does a lot of the conferences. They have workshops at a lot of the conferences such as the NeurIPS Conference. I've seen also specific tracks dedicated to responsible AI at larger conferences like the CBPR, the Computer Vision Conference, the ICML, ACM even. And so a lot of these areas are primitive, so there's so much more room for research to be done in these areas. And also thinking about the larger companies. For example, at Amazon, at AWS, we still publish papers. My team actually consists of scientists and fellows, we call them fellows or scholars who are actually professors who have joint positions at universities and in industry.

And so they're able to leverage the theoretical background and research and also apply it to the practical products that actually get deployed to consumers every day. And I think that is a very interesting intersection because what's in theory is in theory and what's in practice can be different than that. But a lot of times it is influenced. So the more that we work together and talk about it, I think is better.

Rashmi Mohan: Absolutely. I can also imagine the immense benefit that students of some of these professors might have and basically just having a foot in the real world and in the applications of the theories that they're developing, that sounds like an amazing collaboration.

Dr. Nashlie Sep...: Yeah.

Rashmi Mohan: One of the other things that I did want to talk about, Nashlie, was also in terms of when you're talking about eliminating bias in data, I know you have also spoken about just the data set life cycle. Are there any best practices that you would like to share in terms of just keeping training data fair and free of bias? How do you continuously learn and counter your own biases? Are there tools available? What would you suggest is a good way to think about that problem?

Dr. Nashlie Sep...: Absolutely. So a good way to test for biases in your data, we often say look at not just the different groupings of the data, but look at the sub groupings of the data. And so that can be, for example, women who live in the US who are non-native English speakers, or that can be people who live in a certain zip code who make a certain amount of money. And so that's really where you find some of

your disparities when you look at the error rates amongst those sub-groupings and not just the high level groupings. And so sometimes the deeper you dig, the more you'll find, and I think in many cases it's fine. Often it's fine to have biases as long as you're transparent about it. If you're selling a product and being transparent about the intended uses, the unintended uses, that's something that we call a model card or an AWS, we call it our service card.

It basically explains, hey, we tested this model and this is the type of data set we tested on. This is what we found to be best case, best practices for this particular model to hopefully inform the user about how to best use that product because it's very difficult to get even error rates across every single group. And so oftentimes you will have bias, but as long as it's not unwanted bias, you're usually okay. I think also sanitization of the data is very important. Again, AI is all built on the data. That's where it starts. We've heard the saying, garbage in, garbage out. If you're using the calculator and you type in the wrong numbers, then yeah, you're going to get the wrong output.

Same thing works with these AI models, and so having extra care in how data is annotated, maybe even thinking about how you have diversity in the people annotating your data or make sure that they're properly trained and go through some link to make sure that there is some consensus amongst those people that are annotating the data and making sure that there are no incorrect labels, annotated labels in that data. Because I remember back in 2019, we were looking at lots of data sets that were operating data sets, like on the shelf data sets that had already been in the market, and the annotations were just flat out wrong.

They were missing data, it was incorrect data. And so if you think about all the companies that were using these data sets from the beginning, that's terrible in terms of whatever other applications they were building. And you further cascade on more and more issues to this whole system. And so that it just shows you how important it is just in the data alone to make sure that you're taking very much care in the biases in the data and annotating the data. And one more thing I'll say about the data, a lot of times you would think that, okay, if I have an even amount of data for each group or each subgroup, then my algorithm should be fine.

Well, that's not always the case. And so algorithms, machine learning models, are all based on statistics. There's a percentage that you're right, there's a percentage that is wrong. There's even a confidence score as to how confident are we that this result is the right result or the wrong result. And so with that, it depends. Sometimes you need a little bit more training data for one of those groups or subgroups than you would for other groups. Key example, in some data sets using ticks, for example, we did this study with a group of people in a workshop and they were consistently getting the wrong, basically the model was mixing up the number seven and the number one in these handwritten digits.

And so we had to include a little bit more training data for the number seven and the number one, but all the other digits were fine. We didn't include any extra data for those, and the performance did not decrease in those areas. And so it just goes to show you the difference between what we call equity and data instead of equality. And sometimes some groups need more attention or more resources than other groups in order to achieve the same task.

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That's such a great point you make. Nashlie, I definitely want to talk about equity and equality, and thank you for so much for really talking in detail about how to think about data and how to think about eliminating bias in data. I have a shootout question. Say a company that is trying to put out a product, there is always a time to market pressure. You want to get your product out as quickly as possible. Is it easy enough to determine inaccuracies in your data as well as inaccuracies in how your product is applied such that it prevents people from rushing through this process? Because you were talking about it, you want to make sure that you have diversity in the people that are annotating the data, and to be able to get that group of people and to be able to do this in a patient manner to actually get it right takes time. So I'm just wondering, is there a way, is there inherent checks and balances to make sure that we aren't rushing through this?

Dr. Nashlie Sep...: Yeah, so the whole governance piece of that is very relevant because you can have different people, different components. So there are many stages of the AI pipeline even, or even just product development in general. And so there's a conception stage in AI. There's the cleaning your data, there's training the data, there's testing the model, there's more iterations and it all keeps going over and over and over. And so if you have at one end of that pipeline, someone who's not doing what they're supposed to be doing, they're not adhering to those governance practices, best practices, and they're not aware of the risk, if they don't follow those practices, then that can mess up everything else downstream.

And so it's very important that everyone commits to doing their part when it comes to the AI lifecycle, which you say is a very much so an iterative lifecycle as opposed to traditional product development where usually you have a very straightforward software requirements, you deploy that product, you test it beforehand, and it is fine as long as the environment doesn't change, or even if the environment doesn't change, the system still performs the way it's supposed to.

Now, in contrast, an AI model can vary. So we can have another version of the model we deploy, and the results may be different for certain groups, whereas you have certain groups that may have performed very well in that model, now



you may have some groups that performed well, but other groups that performed well before now don't perform well. You also have situations where you deploy a model and it is very susceptible to the changes in this environment. And we call that model drift, where your model now has unwanted biases, whereas when you first deployed it didn't. And so an AI system is very different.

And nowadays, we have systems that are multimodal. So you have some that have agents. You have, especially with the generative AI world that we're in now, we have outputs from these large language models that we've seen Claude, OpenAI, and then you add on filters on top of that, guardrails on top of that, other models and agents and bots that help you connect all these models together in this hybrid system. And every stage of that system, you have best practices that need to be followed. And every system, essentially every subsystem works together to make the whole better in general. So there's a little bit more involved and which is why with AI, these governance practices are very important.

Rashmi Mohan: Understood. Thank you, Nashlie. That's very reassuring to think that people are thinking about governance and thinking about how to enforce this across the industry as well. I want to pivot a little bit to talk about your entrepreneurship journey, Nashlie. I know you have experience working in a startup and as their CTO very early in your career, in fact from what I understand, you were still a student when you joined PartPic. I was wondering, what did PartPic do? What was the problem you were trying to solve?

Dr. Nashlie Sep...: Yeah, so PartPic was an idea that started by CEO, Jewel Berks, now Jewel Berks Solomon. She had the idea of working at a parts company in customer service where people would call in asking for, "Hey, I need this part, I need that part." And this was a large company. And so they would often try to describe the part and how do you describe something that you really don't know what it is. So they'll say, "Hey, I need this thingamabob. It's about the size of my hand. It's black." So she said, "Hey, can you just take a picture, save us both some time. Just send me a picture of the part and then I can send you the correct part." So then she had the idea, what if we cut out that whole interaction and just make it where they upload a picture to an app and the app uses some sort of process to recognize the part, and then we send them a link to where they can purchase and order the part.

And so she did more research. She found out that parts companies have millions of dollars a year that they spend on sending the wrong part and having to send the correct part. So there was an actual business case to this idea as well that she actually experienced. And so she needed some assistant building this product. And so we were connected via a mutual friend and I was able to help build the first prototype and train some of the first AI models that would recognize these parts. And we would say, for example, "Hey, take a picture of the part," the app will walk you through taking a picture. We would ask you to

put a size reference next to the part, so like a penny. And we were able to say, "Hey, this is a hex bolt. It's two inches long, it's half an inch base diameter, and it's stainless steel number two, and this is where you can buy this part."

And so that was what Partpic, the app, actually did. And you're right, I was CTO. It was actually really just helping out at first because I was finishing up at Georgia Tech and she hadn't raised a lot of money for the app and for the business, and I actually graduated, ended up working at a consulting firm in New York City, and I remember getting a call nine months later after we built that first prototype and she was like, "Hey, we raised the money and we need you to be our CTO." And I was like, "Oh." And fortunately for me, I was in New York City at the time and it was like 20 inches of snow on the ground and I was like, "Okay, I'm happy to come back to Atlanta and be back in the south for this warm weather and close to my family in Mississippi."

And so I was very motivated to take that role even though I took a pay cut. I didn't know anything about startups at the time. Interesting enough in the era that I came through grad school, there wasn't a lot of talk about entrepreneurship and startups. Getting my degree in computer engineering, even my PhD. I think maybe the last semester there may have been different programs that we could enter into or maybe there were and I just didn't know about it. But this is a whole world that I had to learn about, this startup world, and how do you raise capital and how do you make a business case for your technology? Because building great technology is cool. As technologists, that's what we want to do, but you have to be able to market that product because ideas are cheap, but it also has to be a feasible product.

And so we were able to all work together as a team, create this company that fortunately we end up selling that company into Amazon. Ironically enough, I was presenting on stage as CTO of PartPic after I came back to Atlanta. And I remember this was in Boston of May of 2016, and I was talking about the technology. I came off the stage. I really wasn't even supposed to be at that conference. Jewel was supposed to be there, but she had another engagement. So I decided to step up and take that on. And I remember presenting and I came off the stage and that's where the Amazon guy, he was in the audience, and he connected with me and we ended up selling the company to Amazon three months later. And I was like, "Wow, who would've thought that this journey would lead here?" And then majority of the team joined Amazon. So I came into Amazon in a very non-traditional way. I didn't even know I would still be here by now, but I am there almost eight years later. And so it's been a very interesting journey.

Rashmi Mohan: What a phenomenal story, Nashlie. I mean, I love the fact that Jewel actually identified a problem, just working a very different job, working in customer support in a parts company to actually be able to have that vision to say, "Oh, okay, there is a technology that can solve this problem for me in a much better way." I also love the fact that you joined the company while you were still a

student and took on a leadership role and a senior technical leadership role as practically your first job. Are there some inherent tricks or lessons you learned because of that experience that have stayed with you and served you well?

Dr. Nashlie Sep...: Absolutely. That was my first time being in a management role. And I learned that people management, actually, you have to be a little bit of many things. You have to be a little bit of a mother, a little bit of a counselor, a little bit of a motivator. You got to get people at their best so that they can be productive because that's what makes this whole company work is you have people doing what everybody does their part, and it contributes to the whole. And so I know for a fact I wouldn't have gotten that opportunity at any corporate America company that I may have been working at. I definitely didn't have that opportunity where I was working at the time. And so actually it was the opposite. It was very much so your typical corporate America, being the only one, being the woman that wasn't heard oftentimes in some of the meetings and feeling like you're always behind.

And it was just the total opposite. I have to compare it to the Marvel movie, the Black Panther, and in that movie, Shuri is the top tech lead person in there, and it's actually a black woman. So I would compare that to me being Shuri at Park Peak, and it was an awesome feeling. Imagine the feeling of no glass ceiling. You literally do what is needed. You have none of the extra anxieties or imposter syndromes, and you are able to just be productive. And it was an amazing feeling that led to me being manager even at Amazon once we got acquired and managing teams for years to come. I'm actually an individual contributor now, but I wouldn't have known I had that skill set if that opportunity had not presented itself.

Rashmi Mohan: What a fascinating story, Nashlie. I completely understand what you're talking about in terms of that, the level of confidence that you could gain from that experience. And when you talk about no glass ceiling, it's amazing because once you've played the role, and I feel that's true for many individuals, mostly women, is once you've played the role, you realize that, oh, that was not so hard, and I can do that. But until then, you're always doubting yourself and always thinking you need to do two more things before you can aim for that bigger role. So it's really very heartening to hear what you're talking about. And you are a serial entrepreneur because now you are a founder of Bean Path, a non-profit organization. You are on a mission to change the narrative of what is possible from a city in the deep south of the US. So I'd love to hear more about Bean Path and your vision for Jackson, Mississippi.

Dr. Nashlie Sep...: Yes, yes. So obviously having all of this success, especially early in my career, having joined Amazon, actually when I turned 30, and that's when I realized, okay, have I made it? Is this the promised land? Is this where I want to be, this where I want to end up? And so just trying to realize, I actually felt like this wasn't the end. It was so much more that I wanted to do, that I could do, especially now with a lot of more financial resources. And so I decided...

Actually, I remember talking to one of my colleagues at work, and he was actually an Indian gentleman, but he lived in Silicon Valley, San Francisco Bay Area, and he was on one of our teams, and we were just talking at lunch and he was saying, "Yeah, I own two shopping malls in India." And I was like, "Wait, what?"

Wait, you could still do that and still do what you're doing. And he was like, "Yeah, people do it." And that was really the first time. And I knew that, again, we're often taught you go to school, you get a job and you retire, and that's it. I didn't know that there was this whole entrepreneur world. Like I mentioned, I didn't know anything about startups even though I was working at a startup. But I definitely didn't know anything about this world of working in corporate and still being an entrepreneur. And there are so many people that do it. I've come across people that own gyms and smoothie shops, and they're able to create businesses outside of their work because as you know, working in the tech field, it can be very lucrative. And so there's a lot of things you can invest in with your money and with your capital, including real estate.

And so I thought along with I want to do something more for my hometown and my community that I grew up in and how do I pay it forward? And so I went to Jackson and I remember looking to start this organization that would help people move more progressively in terms of technology and provide the community with these tools and access to this expertise that they needed in order to strengthen this huge tech gap that we have, not just in Jackson, Mississippi, but a lot of places across the Southeast. And I think there's more disparities even in Mississippi, given that majority of people in Mississippi actually live below the poverty line. So there's a huge lack of access to internet even. There's a lack of access to just having and being in this conversation about the tech ecosystem and what's possible. I believe tech can be a game changer for someone.

It can really change your lifestyle, it can change your trajectory, it can change generational wealth. And so I wanted to impart that back into the community. So I started the Bean Path. Bean Path comes from being a... Most people know, my coders out there, know that Bean was actually a computer programming term in Java language, which is a smaller function that you can add on and extend as much as you need to make it do more, like the building blocks. And so most people though, think of bean as a seed. You put it in the ground and it grows. And I'm a gardener as well, so I have some beans out there every now and then they grow into this vine that just takes over. And so we were trying to help people find their pathway with technology. And so that's where the name Bean Path came from.

We started in the local libraries in Jackson, Mississippi, and before we knew it, people were lined up at the library doors coming to get this tech help. We were setting up a tech help shop. There would be everyone from people's grandmas to kids who just wanted to see what an engineer looked like, what does the

engineer do? What does it mean to major in computer science? And we provided that access right there for them in the communities. And so I then proceeded to purchase land in Jackson, Mississippi, actually downtown, so we could scale what we're doing. It's one thing I learned at Amazon is how to scale. And so I also knew that the wealthy owned real estate. So not that I thought I was wealthy or anything, but I just thought it was a good idea. So I decided to purchase property. We now have 22 acres and eight buildings in downtown Jackson.

And this is in an area that is very much so in need of revitalization. And so to date, we have two buildings that we've renovated. One is the Bean Path headquarters and MakerSpace, it's the first MakerSpace in downtown Jackson. We do a lot of activities there, everything from AI and robotics to 3D printing, laser cutting, woodworking, pottery, sewing, embroidery, drones. So lots and lots of activities there to fuse what the people are used to, to things that they aren't used to, and being able to merge the two in Steam.

And then also our second building is our big event venue, which we actually called the Bean Barn. It's funny because when I went to purchase the Bean Barn, they already called it the Bean Barn, they actually used to process soybean and cotton in this facility. And so it's a huge 17,000 square foot barn in the middle of the city. And so we purchased the Bean Barn, and now we have other activities there, like we're getting ready to start food trucks and yoga and skating lessons and things like that. So really bringing the community out and creating a hub for the community. And indirectly, before people know it, they're learning about all these emerging technologies and helping to move the whole community forward.

Rashmi Mohan: You are such an inspiration, Nashlie, just listening to you talk, I can feel the passion in your voice, and I love that you're applying the skills that you're learning in your day job and really inspiring an entire community of people. And I strongly believe that one person dreaming big and making things happen can uplift their entire community. And that's exactly what you're doing. It's fascinating, and I wish you all the very best for all that you envision to do with Bean Path. This has been such an amazing conversation. For our final bite, Nashlie, I'd love to hear from you, what are you most excited about in the next five years, whether that's with technology, AI, or with what you want to do with Bean Path?

Dr. Nashlie Sep...: Yeah, so I'm really excited about the future of AI and the fact that I can now have this AI conversation with a lot of people because we tried to have this conversation 10 years ago and people didn't know what we're talking about, but now people know what we're talking about, so we can now have this conversation. And hopefully that levels the playing field a little bit more. Hopefully people are a little bit less intimidated with AI and the technology, and along with learning the limitations, hopefully they also learn how to use it to their benefit in their day-to-day lives. I'm also hoping that this opens up the

world for more innovation, especially in areas that didn't have access to this technology before. I'm very excited that more companies are thinking about AI in a more responsible way than before, and that our government is also concerned about how do we continue to enforce people using it in a responsible way.

So we will continue to move the charge there. And then lastly, with the Bean path, I'm excited for growth, the Bean path, the Vine, it's going to keep growing. It's going to keep dropping seeds in other locations and maybe even scaling across other cities like Jackson that could use something like Bean Path to help embed these tools and knowledge and networks in the community to bridge the tech gap. So as long as I'm here, I'm going to keep doing my best in what I can do to help move things forward and partner with anyone who's interested and excited about the future.

Rashmi Mohan: Fantastic. Thank you for the thoughtful and inspirational work that you do. And also thank you for taking the time to speak with us at ACM ByteCast.

Dr. Nashlie Sep...: Thank you so much for having me.

Rashmi Mohan: ACM ByteCast is a production of the association for Computing Machinery's Practitioner's Board. To learn more about ACM and its activities, visit [acm.org](http://acm.org). For more information about this and other episodes, please visit our website at [learning.acm.org/ByteCast](http://learning.acm.org/ByteCast). That's [learning.acm.org/B-Y-T-E-C-A-S-T](http://learning.acm.org/B-Y-T-E-C-A-S-T).