

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 am your host Rashmi Mohan.

Talking about artificial intelligence and its impact on humanity has been a trending topic across the world. We are either touting its miraculous benefits to every aspect of our life or predicting the doomsday scenarios that it could bring our way. Love it or hate it, there's no ignoring it.

Our next guest might arguably be the definitive voice on all things related to AI. At last count, a few hundred connections away from 1 million followers on LinkedIn and a LinkedIn Top Voice 2020 finalist, he is definitely a force to be reckoned with. Steve Nouri is an award-winning technical leader, a data scientist, an academic, an entrepreneur having founded multiple ventures, and a global leader on artificial intelligence. He is on the Forbes Technology Council, a committee member at the International Organization for Standardization or ISO, and the founder of the nonprofit organization, AI4Diversity. Steve, welcome to ACM ByteCast.

Steve Nouri: Thank you for having me, Rashmi.

Rashmi Mohan: Great. No, we are super excited to have this conversation with you. I'd like to lead with a question that I ask all my guests. Steve, if you could please introduce yourself and talk about what you currently do as well as what brought you into this field of work in computing?

Steve Nouri: My journey to computing and data science is a little bit of a boring one, which, as a child, I started with playing with computer games when I was 10 years old. I think my dad had a plan for it because he bought a computer not for gaming and I ended up playing a lot of interesting computer games of the time, probably early nineties, which was not the highest quality of the graphics, but it was nonetheless interesting.

It just evolved from playing computer games and then trying to understand how to make computer games. To be honest, I was thinking, how can we produce programs that can do all those graphics and sound. When I was 14 or 15, I went to a computer educational course and there was a person sitting besides me, was doing programming and I was just watching, it looked like magic, he was just writing a couple of sentences with numbers. And then finally, after executing it, he would see some shapes with colors and screens. So I was like, that is magic, that's what I actually wanted all the time to learn.

When he left, I started playing with his codes. So I started changing those numbers and things that I could understand. It was easier to play with colors, if

it was a red, I changed it to maybe green and then I could see which one of those shapes are changing colors. Essentially, it was a streamlined jumping into programming when I was 14 or 15. And from there, I was always fascinated with computer coding. I did codings in many different languages starting from C, C++ and then visuals, Microsoft, visual Basic, and C#. And I did my Bachelor's in software engineering as well.

As I said, it was so straightforward to what I'm doing right now that when I hear people have very interesting background of doing something totally different and accidentally finding out about data sciences, sometimes I envy. I was a project manager for a project, hospital information system. We were collecting a lot of data related to patients, medicines, procedures and I always wanted to understand if I can do something more with those data. It seems that we have some ways of querying these data, but it's not as dynamic. It's not as complex to extract all the interesting nuggets in those data. So I started doing research around 20 years ago to understand what in the world is used to extract those patterns and more interesting insights. That's where I got into data analytics and did my masters in data analytics. Back then, the terminology data science was not coined or it was not as popular so we were using knowledge extraction or data analytics in the same way.

Long story short, I have worked for many companies, mostly government and public sectors since then as a lead data scientist and head of data science, managing teams, delivering products, doing research. It was an interesting rollercoaster ride of working on in the startups, very fast pace and then working for public sector, which is much different from that environment.

And these days, I mostly focus on the projects that I'm running myself. In the private sector, I have founded two organization, Hackmakers and AI4Diversity and also advising a couple of companies. As you just mentioned, I'm in advisory board for hardware business review, I'm also a council member for Forbes and do a couple of little things here and there and enjoying the geek word of the technology and data.

Rashmi Mohan:

That's fascinating. Not the word of choice that I would use in terms of little, but an incredible journey. And I don't think you need to envy anybody, Steve, those of us that find that passion early on, I think it's an incredible journey for you to be able to build on that interest from playing computer games to actually being so deeply involved in data science.

And I know you've had such a diverse career, almost seems like a lot of it is self-motivated, a lot of self-learning where you're looking at code from what a friend was doing to then saying, I want to actually understand how I can extract more value from this data. I know you also worked in the Australian government's research institution, CSIRO, I'm sorry, CSIRO. I was wondering if you could maybe talk a little bit about that phase, Steve, what areas of research did you pursue?

Steve Nouri: Yes, you are actually right about being self-motivated. I just randomly find something that I care about and just my brain locks into it and I have no way out until I find what I want to learn or at least I need to satisfy that curiosity. As you mentioned, the work that I did for CSIRO, I was working as the head of data science for Data61, which is a business subsidiary of CSIRO, focusing on data science and AI. I was responsible for a great team of researchers, software engineers, product managers, and we had three major projects back then.

One of them was more entrepreneurial, which was a product. We were trying to understand what are the traits of the students that make them to be successful finding a job during or after graduation. So we made a product as a website and then we tried to match students with jobs in startups or smaller companies. And by doing that, we started collecting data and use those data to understand those trades. There was a couple of studies that published articles and studies that published and we also collaborated very closely with universities in that regard.

Apart from that, there was another interesting research, that one was a little bit more different in the topic, but at the same time, interesting. So there was a team of researchers that we were working on understanding or predicting the financial outcome of the companies using the public data, which is not necessarily indication of the financial stage or their income. For example, what is the current state of their website and the language they use in their website, the technology that they have used in their website or anything that we could find and scrape it from the internet that is available in a public domain?

It is interesting that we were able to predict the company's financial situations in terms of being successful or not just using this public data with a pretty decent accuracy, I think it was around 60% or something around that, which is not too bad. Because essentially, we didn't have the direct indications of the work that they were doing and it helped us to also help the government. When a government wants to give away grants or help these companies, sometimes they don't have access to a lot of information about them and that'd be somehow a helpful tool for decision makers. And these two were the main interesting research projects. There's a couple of other things that the team were doing, but I'm very proud of these ones because we could be able to finalize it during the time that I was there.

Rashmi Mohan: No, they sound like great projects. And also, to me, it sounds like, of course, the government was interested in because it was a good way for them to understand where might be the areas where they should be investing or at least marketing the new grants that they might have available. But also, seems like the target audience that you were reaching out to probably were willing participants. Because there's a fair amount of benefit that they get, whether it's the entrepreneurs that are looking for funding or the students that are looking for jobs. Did you find that it was easy enough to be able to gather this data with the participants?

Steve Nouri: 100%. For example, for students, it was even more than willing. They were very excited about being part of this platform because we found that it's much more important for us to deliver value before asking for any data or any help. So that's why I said there was a little bit of entrepreneurial mindset behind it. A lot of government research is directly going into databases and the information is available or sending surveys and it means that there's nothing for you in it. It's all for the research, which eventually it would go to the public, but there is no immediate benefit for the person.

But we made a website to actually match these people to an internship or graduate roles and that's where they could get a lot of benefit because they could just literally use it as a tool to find a job. And this information would just be something they would fill in the form to find the perfect match so it was very easy, there was a lot of excitement from our students side and academics were also very helpful. At the same time, startups were also very supportive of this project because they could find higher quality students matched with their requirements. So that's a best scenario, everybody's winning and getting the value out of this relationship.

Rashmi Mohan: For sure, that sounds like definitely a match made in heaven. But one thing I wanted, it happened and you were talking about the entrepreneurial nature of these projects that you were working on. You've been an academic, you've been a teacher in some part in your career and you continue to be somebody who enjoys sharing knowledge based on your online interactions. So did you feel like you had that spirit of entrepreneurship and being able to apply your research to build products or build value from the beginning? How did you approach this whole idea of these projects or even your work with Data61?

Steve Nouri: First of all, about the teaching, I was always fascinated about the power of teaching. In terms of learning, I remember very early days when I was probably 17, I started teaching to students at high school. So back then, my programming skills was a little bit beyond what is expected for a high school student so I was able to leverage that to help others. As I said, I could understand what is in it for me in terms of getting the returns and that was the motivator for me. I could see that I'm helping others, but at the same time I'm learning and it motivates me to stay on top of the trends, update myself, push myself forward. So from there, I was always passionate about teaching.

And when I went back to university to teach advanced machine learning, I exactly thought about the same scenarios, how can I do something that would help students get ready for a job and then at the same time make myself interested and excited? And that particular course was literally the most advanced course for post-graduate students, it's called Advanced Machine Learning. And me coming from outside the academia, it was also interesting for students to come to my class and ask the questions about how the real life situation is for a data professional, how they're going to leverage it in their work later and a lot of questions that made them more engaged. And that's a boring

course, which is very deep into machine learning and math and stats just became more interesting and engaging for them, I hope so.

And as you mentioned also, when I was at Data61 at CSIRO, I always wanted to think, how can I take those studies further? I really enjoy the interaction with people at the impact of the work that I'm doing and also being more closer to the consumers or the users of those projects, I think that has been always obvious. So from there, my mindset always was like, which one of these projects can be a spin off from CSIRO and Data61? I think that's an interesting one that we were able to spin off that project, the website from CSIRO and that became a commercial product that was acquired by another company, which is a very successful outcome for a research project to go forward and become an impactful business. And kudos to the team and all the people that helped during this project, the managers, the directors, and all the team members to make it happen.

Rashmi Mohan: That's such a great story, thank you for sharing that. And one of the other things that you mentioned, which I think is immensely valuable, is that, to you, teaching is a method of learning. And I agree, I think most of us also feel that way, that the more you teach a certain topic, the better your understanding of it grows and the finesse with which you're able to communicate and really get to the meat of the topic improves with every subsequent conversation that you have around that topic.

I know that you currently are such a prolific content creator, if you will, you shared a diverse pool of content online on LinkedIn. You talk about startups that are making waves in AI or tools for anybody who wants to enter the field and you've focused on ways to build diversity in the AI field. I'm wondering what sparked that? Was it a part of this whole, I love to teach and so I'm going to share information with folks and enable them to break into this field?

Steve Nouri: Yeah, that's actually pretty much aligned with my teaching at university. There was a mixture of things that has happened at that point of time. At that stage of my life, I wanted to grow my network professionally and also I was teaching data science at university and my students were really enjoying the content and they were asking me for some recommendations about future studies in different relevant topics or how they can get more hands on with those theoretical parts of the course. So I was always researching about, what is available, is the library is available in Python or what is the new platform? Just because I had to answer those questions and as a teacher, as a lecturer, you try to be the know all and try to answer as much question as possible. And I was like, so I'm doing this research, I'm sharing it with my own students, they are loving it. I would like to try to see if I can use the social media and share it with a broader audience because that's the reason that social media exists, you can get more audience around the world.

And I just started doing that for some time and being consistent was very important because I was literally sharing things once or twice a week at the point of time that I started six years ago. And at that point, seems that data science was still a little bit of mystery, I don't know if it is still a mystery or not, but a lot of people wanted to enter into this field. They didn't know how to do it and they didn't know where to find the right material. There was a little bit of hype around AI and data science, there was a lot of interest in learning and also it was a very high paid job. So all of them together and that coincident of me being available sharing it, it seems that I was one of the pioneers of the learning materials in data science and AI on LinkedIn. And that helped me to get a lot of visibility through that short timeframe.

And then later when my focus shifted from teaching to actually doing things and those entrepreneurial projects, then I started mixing my content with the latest innovations and the latest projects in AI and data science. The innovative projects that have impact, especially whatever is using AI to deliver some social impact or pushing forward the technology. And that also opened up another front and a lot of people started engaging with my post not necessarily wanting to learn about AI in a sense of doing it, they wanted to understand what AI is doing to their current or future and they wanted to know how can they leverage AI without being an AI engineer or a data professional. So that was the story.

And through this six years of nonstop being available sharing things that people like it, and that's essentially what I liked for myself and what I enjoyed and in am interested to learn. I got a lot of people supporting my content and I appreciate all of their support and it seems that this is my brand right now, that everybody knows what I'm going to share every day. People are excited, probably interested hopefully that see my post about the future of AI or maybe a bit of nuggets about how to learn a particular tool or maybe a new platform.

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And that's such an amazing and interesting trajectory, Steve, because, like you said, started out with sharing content for people to learn. But I'm sure as you started to share more content around, these are the new innovative applications that are coming up in this space, those are of interest to you. But I'm sure that also drove commentary on people giving you views that probably aligned with yours as well as views that opposed yours. And that's a part of the journey that you spoke about, teaching that leads to learning. I'm sure that enhanced your own knowledge about each of these areas that you were talking about.

The other thing that I want to touch upon, which I think you briefly mentioned, is talking about personal brand. Because really, almost 1 million followers on LinkedIn, this is a very significant part of your identity now. And as a practitioner

using the power of LinkedIn and understanding how to leverage this wide reach for the benefit of others and yourself, it's pretty amazing how you've been able to do it. But I would love to understand, what do you think is the biggest driver for this? I know you're personally motivated to share, but what would you say is a good reason why anybody who's navigating their career should think about it? Why should anybody consider building their brand online, from a technical perspective?

Steve Nouri:

Of course, everybody can have their own motivation of why they want to be in a social media platform or why they want to use it to make their own personal brand. But what I've learned through these years, is that having a personal brand will give you another dimension from being an employee. Because as an employee, you are bound to your employer and all of your identity is within your interaction with your employer. And that is fine, but you can always have more in that. You can always have leverages in terms of, let's say, finding a new job, finding a better job, or connecting with like-minded people that will bring more opportunities. And this is for everyone, just literally everyone should think about, what are the other opportunities out there for them to grow to connect to people to find more interesting careers in the future.

A social media platform like LinkedIn specifically provides huge amount of opportunities. That is, sometimes people used to tell me back then when I started, LinkedIn is just a placeholder for your resume, you need to just come back here when you're looking for a job or you want to update your resume, that is supposed to be LinkedIn. I understand probably when it started that started as a resume face holder or every six months you would share your new certificate or whenever you change job you just change your title and everybody will just say congratulations. It evolved from there to being a content platform now.

After Microsoft acquired LinkedIn, they had a huge push to make it a content creation platform essentially similar to YouTube, to TikTok, whatever other platforms that are out there, but in a professional manner. So you need to just make sure that you stick to certain criteria, which it is not very different from the other platforms, but you might want to share the content that are relevant to your career or would help you to get connected to your future customers or employers, that's what I can understand.

But at the same time, another takeaway is that, by adding value to your audience without expecting something direct and short term, you would accumulate huge amount of opportunities that you can always go back to leverage in any sense. If you want to be an entrepreneur in 10 years from now, even if you don't know what is exactly going to look like, it is better to start connecting with people and start adding value and make people to be aware of you and have a positive image of you because the moment that you actually need someone to listen to you, it is too late to start.

We can always argue it's never too late to start, but I'm going to just go out of the, I didn't even say, it is too late to start when you need it because things happen in a very step by step and long term fashion. You need to be consistent, you need to think about a long term gain to be able to do it. And then when you already have your business and you want to talk about an interesting product that you want to release tomorrow, that is probably a little bit late for you.

Any students that are learning any courses, they need to start sharing more on LinkedIn, they need to be more active. They always ask me, I'm not a professional, I haven't learned this topic yet, I'm not an expert. I don't feel that I need to talk about it because there are lots of professors in here, there are lots of professionals with years of experience and I don't have the right to talk about any topic. And that cannot be any wronger than this, it is totally incorrect understanding of social media. You can literally talk about your learning journey.

I'm just going to make it very straightforward and easy. If you go to a class and they teach you math and the stats, you can literally come to this platform and say, I learned about this particular equation today, I found it very interesting. This is the background, this is what it is going to be used for and maybe a couple of links to the places to learn more about it and that's it. This is how you can start, it doesn't need you to be a professor to talk about an equation or anything that you learn from maybe a movie, even a motivational source of motivation from a movie, or something that you experience in real life at work, at university, at college. All of them can be great materials and people would appreciate it.

The other aspect of sharing on social media is that, always, you would get people coming back to you with some feedback. Some of them might not be very helpful, some of them might look a little bit too aggressive. That's the reality, you would learn from it anyway. Whenever you have in a stance, whenever you have an opinion putting a line in the sand, there would be people that would agree with you and some people would disagree, and that is a good position to be. If you want to be known and you want to have your own identity, then you need to have an opinion. If we are all afraid of putting our opinions out there just because we will be judged and we might get negative feedback, people might disagree with us, then the other way is just to be indifferent and stay quiet. I cannot see any benefit of just becoming invisible in the world because somebody might not be happy with our stance.

Rashmi Mohan: That's such a incredibly valuable viewpoint, Steve, because I think that's probably what holds many of us back, the fear of being judged. But also, the other piece that you brought up, which is, you don't need to be working on something pathbreaking or something that has never been said before in order to share what your viewpoint is. Like you said, if I learned something, my journey of learning that same math equation that maybe 10 other people have learned might just be slightly different. And I think putting your journey out there, the way you learned, as well as maybe some of the challenges that you

face might help someone else feel more validated that, I'm not completely off the mark and there are other people who have had this similar experience.

And I think of that particularly, especially when it comes to diversity and there's a lot of commentary on, especially folks that come from a slightly diverse background in tech, whether that's gender or age or whatever that might be, are hesitant to participate in these forums because they don't feel like they belong. And I think the more of us that do that, it just makes the entire environment a little bit more welcoming.

Steve Nouri: That's totally 100% true. Even for people with diverse background, this is the best place to find the others that are supporting you or similar to you. Like, Even if I'm a minority in my geographical location, I can still find people with a similar background on social media, it's not too difficult. And it's out of maybe 500 million people on LinkedIn, you would be able to find couple of thousand that totally have the same experience or similar experience, they would be supportive. You would find people that are helpful, they teach you something, they would be able to give you opportunities.

That's just thinking about, the half full of the cup is the best way to go forward. You don't need the 500 million people on LinkedIn to be able to leverage the value of LinkedIn. It just literally starts from the people that you know at university, the people that maybe are available in your geographical location, and the people that have the same journey as you are having right now. The students, maybe if you are learning anything about, let's say, computer science, then that's where you will shine.

Rashmi Mohan: An extremely refreshing perspective and to reiterate what you had said earlier is, your career itself is a marathon, not a sprint. So investing in it for the long term in terms of thinking about where it might go, but starting to invest in building that brand for yourself is super important and this is a great way to do that.

I did want to talk about your two entrepreneurial ventures as well that you're currently involved with, Steve. One of them is called Hackmakers, what brought about the interest in hackathons? It's obviously very popular, it's an exciting thing for engineers to participate in. What did you find valuable and what is the value proposition that you feel companies that engage with you get out of it? What is the ROI that they're looking for?

Steve Nouri: It is another interesting story. I was head of data science at ACS, a Australian computer society in Australia. And then what happened is just, during the COVID, probably the first or second month of the COVID, there was a news about, Australia will have probably too many COVID cases very soon and we will not have enough ICU beds for those people in need. So there was a conversation about, how can we flatten the curve and how can we probably

stay at home even more, take care of ourselves, make sure that we would not hit that particular problem of demand of supply?

And at that point, we came up with an idea of running a hackathon. Let's have a hackathon, people stay at home during the weekend. It was probably around the Easter holidays where everybody was not sure what's going to happen during Easter holidays, are people going to go out and socialize and make the situation go worse? Or are we going to all together decide to stay home and make sure that it doesn't go wrong? And we thought maybe that is a good idea for people that are staying at home, especially the techies, because I believe that hackathons are techies playground. So for techies, maybe that's a good way to spend time during the holidays, since they're locked up at homes and they cannot do anything fun, they joined this hackathon, which was called Flatten the Curve to socialize, build something.

And essentially, we had two goals of keeping people interested happy at home and also at the same, time delivering some solutions for this particular problem of the COVID in early days. It went super popular, the project timeframe was literally 10 days from the moment that we started advertising and talking about it to the moment we delivered this hackathon. And in 10 days, we're able to get around 2000 participants in majorly Australia and New Zealand. And that was the aha moment, the beginning of thinking about running hackathons.

Later on when I left ACS, I was thinking, this is my passion, I loved it, I want to do it more frequently. And it seems that this is something that probably during COVID, people would be more interested. So I literally started with my team to run hackathons every couple of months as a fun side hustle for us. It wasn't supposed to be a job, it was supposed to be just a fun thing to do. But then during such a short time, it became very popular and it got a lot of interest of these large corporates to be part of it as a partner, as a sponsor from Microsoft, Google, Oracle, IBM, and you name it. They were reaching out to us, we were reaching out to them and that was a very good collaboration happening there that showed us that there is a value of doing it better and more frequently.

Then it became a startup, we got funded by the government, we also got some investors. And we're building the platform right now, it is an end to end innovation platform which will enable people to go through phases to be able to come up with some interesting innovative solutions for problems from the ideations, from coming up with different ways of tackling a problem systematically and then collaborating to deliver a POC or an MVP in a platform that would allow you to collaborate in a virtual environment. That is the goal, we are in the earliest stage of delivering that. Right now, there is something interesting happening, we are going to do it in a web 3 fashion in a decentralized way, which means that we're going to open it to the public to contribute to this projects and to own it. That is probably something that will revolutionize the whole community aspect of the internet in future. And we would like to be one of the pioneers of leveraging that mindset of web 3.

That's the next step for us. We have done hackathons with a couple of great companies and organizations around the world. And the last hackathon was the World Innovation Day, which was the second time we did it with the help of international organizations like UNESCO. And all the big tech companies also usually will come into deliver such an interesting project that would help the global community come together and think about innovative ways to tackle the problems that are we are having all together around the world, which is identified by United Nations as global goals. So it was a very successful event, around 4,000 people participated and we are hoping to continue that fashion and always try to innovate the way that we're doing it ourselves. We learned a lot in the last couple of years, we have been running it for two years already, and this is an evolving community project for us.

Rashmi Mohan: Well, congratulations. That impact and the amazing work that you're doing is definitely going to have far reaching impact. I think the fact that you're also now opening it up for contributions will only mean that it'll be so much richer with the newer ideas that come in for you to be able to grow it. And also, it sounds like a lot of the projects that you've been working on recently is more for tech for good, which is always something that's very warm and close to my heart for sure.

I could go on with this conversation, Steve, but we are running out of time. But I would love to ask you for our final byte, what are you most excited about in the field of AI over the next, say, five years?

Steve Nouri: That's a very difficult question to answer because I'm excited about a lot of things happening, very good projects in different directions of the applications of AI in industries. One thing that I'm very excited is one of the projects that we are pushing forward, AI4Diversity, and it is essentially a community led project. It's a non-for-profit community led projects that would bring together different groups of people with different backgrounds, the people with different socio-economical background, with the culture background, with different gender, everything that can of bring this diversity together would be ideal for us. We have started it around six, seven months ago, we already have more than 10,000 people signed up from all over the world to be part of this initiative. This initiative essentially is planning to educate and enable people with different backgrounds, but also is going to help us understand how can we ensure the fairness and the notion of responsibility for AI.

And it doesn't mean that AI we're going to be responsible, we are going to make a responsible AI that is transparent, accountable, people are making it in the fashion that it's fair and explainable. And if something goes wrong, we are able to understand it, mitigate the risk, and if not, there is a way actually for people to intervene and make sure that it will not impact anyone in a negative way. So that is one topic very close to my heart and very soon we will start opening the chapters in different countries, collaborating with our partners and see how can we deliver some social impact for good.

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Rashmi Mohan: That is definitely something to be very excited about, thank you so much for telling us about that. I hope our listeners also check it out and participate, I, for certain, will. Steve, this has been an amazing conversation, thank you so much for taking the time to speak with us at ACM ByteCast.

Steve Nouri: Thank you very much, Rashmi.

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