Future (/Future)

We can take machine learning everywhere but it's not going to be one size fits all: Alan Edelman

Jayadevan PK (https://factordaily.com/author/jayadevan-pk/) | January 25, 2018 | 7 min

The demand for talent that can work on artificial intelligence and its applications is set to spike as it becomes pervasive in industries ranging from automotive to retail. Tech giants are fighting over AI talent, often paying anywhere between $300,000-$500,000 (https://www.nytimes.com/2017/10/22/technology/artificial-intelligence-experts-salaries.html) for their skills.

It's still early days but in Bengaluru, which led the charge during the outsourcing boom, some early moves are being made to ready talent for the fourth industrial revolution (https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-

means-and-how-to-respond/)— one where machines and software meld into one.

Can India supply that talent? Last week we wrote about how the country is moving to address the AI talent supply gap (https://factordaily.com/india-ai-talent-gap-google-microsoft/). Earlier this week, we caught up with MIT's professor Alan Edelman and Viral Shah, the co-creators of Julia Programming Language (https://factordaily.com/viral-shah-julia-computing/) to ask them what next.

Edelman, a 2018 IEEE fellow and the winner of awards including the Charles Babbage Award, was in Bengaluru to teach a batch of 80 students in Machine Learning technologies at the Ramaiah Institute of Technology, which trains thousands of engineers every year.

Edited excerpts from the interview.

As science and technology begins to come into focus, how is education changing?

Edelman: There's traditional teaching, which in a way is starting to feel old-fashioned sometimes, and then newer MOOCs that caters to quick learning and can scale once you create them. I think the human element is lost in some of these things. Learning, in the end, is not from the textbooks. It's what you learn from other people and that will never go away. It's not one or the other — you take the best of both worlds. Many MOOCs will die but the ones that capture the human element and the cutting edge will be the winners.

I come from a math department. You see math going on a board and if you like ideas, that's exciting. There's a very small number of people who love ideas for their own sake. Most of us like to see where ideas get used and that's what brings it alive. Until recently, it's been difficult to take these theoretical ideas and bring them to the real world. But now, anybody can bring it to life. This is what we are doing with Julia.

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Shah: I remember when I took Alan's Random Matrix Theory class (not officially) and I'm not a mathematician. I'd go through chapter one and I'm like I understood everything. Then chapter two and three and then there'd be this one line that made no sense and I'd drop the class. But then, Alan would help me push through the line. That unlocks the rest of the class.

Why does machine learning require interdisciplinary skills?

Edelman: People are quite compartmentalised in these worlds. Maybe you are a good engineer and not a computer scientist. Then the other way, you could be a computer scientist and not worry about solving the engineering equation. That was fine for many years. Machine learning has changed the world here. You got to have the whole thing in one system now. Nothing has ever demanded it at this level before.

It's not just good enough to be an engineer who writes code and make it work just because your boss wanted it yesterday. It just doesn't work anymore. It's also not enough to build a beautiful system and make it work but not address the heart of the problem. Now you have to teach people to become more than they are.

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What's really the demand for AI talent?

Edelman: Machine learning right now is very different from what we see today. It's as much art as it is science. Sometimes it will just work and you can push a button. A lot of times, it doesn't work.

> People are hearing the hype now and they think it will solve everything.

People are hearing the hype now and they think it will solve everything. We need to take this body of work and bend it to new needs. We need people who understand not just how to press the button but a bit below so they can change it, make it do something different so it can accomplish what it was meant for. In today's world, we can take machine learning everywhere we want but it's not going to be one size fits all. We'll still need the human element. There's so much art to designing a neural network. We need many skilled people to do that because we can now apply this to the whole range of human knowledge.

Shah: Unless you believe that Google or Amazon will do everything.

Edelman: Google will do a lot of things for a lot of people. But not everything for everyone.

Countries like China are investing heavily in AI talent…

Edelman: They're smart.

Why is there so much interest from nations all over the world?

Edelman: We all believe it's going to change everything– how things are done. You want to be part of it.

Shah: Silicon Valley is driven by the Big Five and China is driven by the Big Three. We believe that basic math and science which is relatively strong in India combined with the right form of training should make everyone masters of these skills. Democratising is the name of the game. Programming is a basic form of learning.

Edelman: They're not that hard to learn. The perception is that if you don't have a PhD or work for Google, you'll never be able to figure this out. It's not true. This stuff is eminently learnable and is probably easier than many things that we try to teach. It can be done in a manner where humans can be enabled to create new possibilities.

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On jobs, which side are you on?

Edelman: In the end, it's going to be a team of computers and humans. It's never going to be just computers for at least the next century or two. I don't want to go beyond that. This business about computers replacing humans is utter nonsense. Enhancing humans for sure.

Boring jobs will go away. New jobs are being created. That's the way human experience has always been.

Shah: It's a big opportunity for India, especially. Y2K was a big opportunity where the latent talent in India could be put to create economic value creation. Machine learning offers another opportunity. India writes the software for the rest of the world and there is no choice but for the Indian IT industry to take on the machine learning layer of the software stack now, otherwise someone else will.

How should a young engineer approach a career?

Edelman: Creativity is the realm of the humans. Rote stuff is for the computers. You might have to do the rote stuff to improve the muscles but it's the creativity that the world's going to value going forward.

Shah: It's all about enabling rather than building gates. Our system builds gates and lets you through if you write the right answers. But real enabling is about empowering students to learn at their own pace and learn things that are not necessarily for some arbitrary degree but in the true sense of learning.

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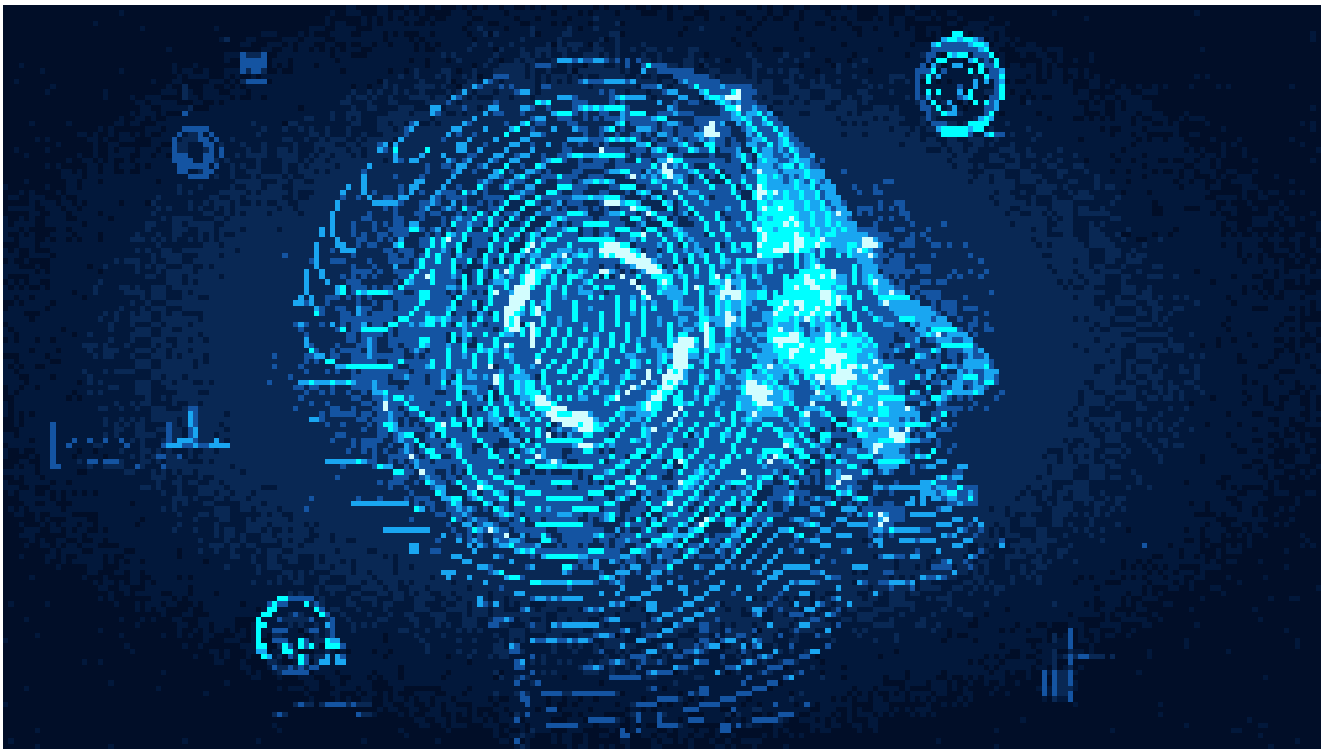

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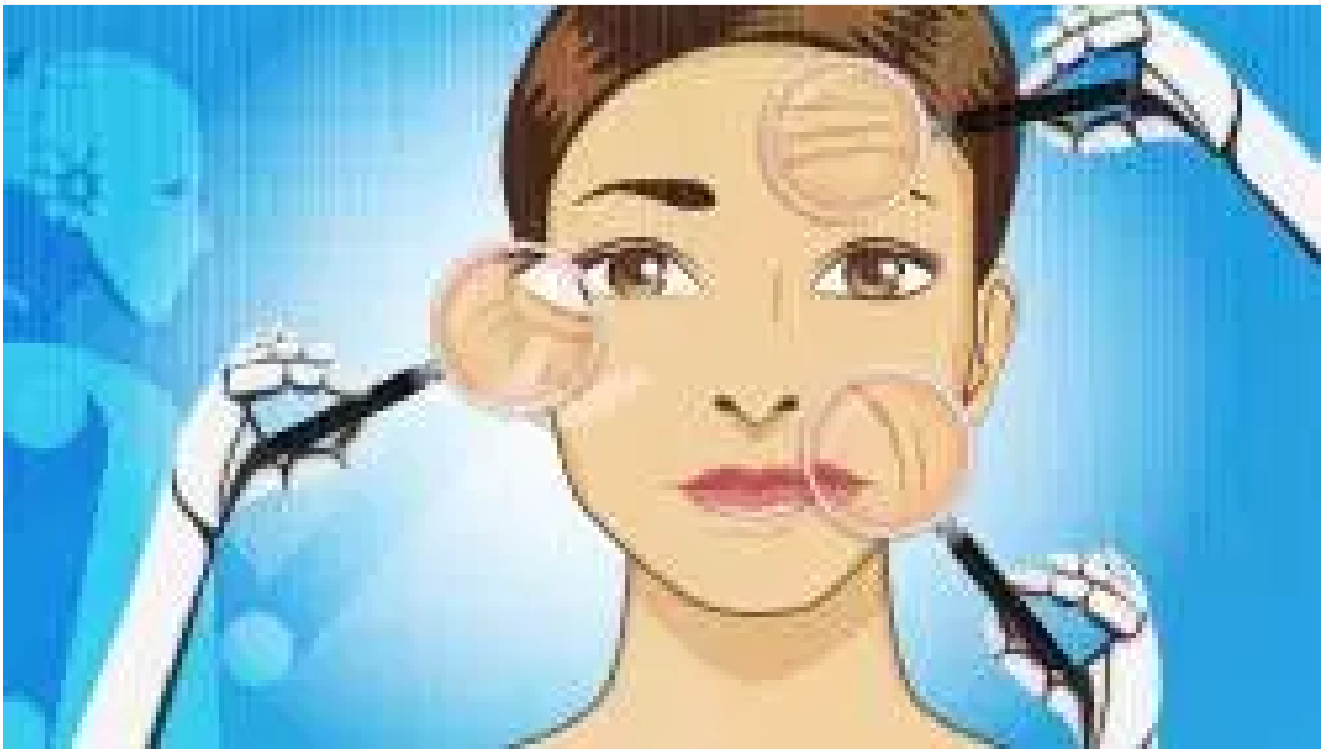

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