# World Engineering Day for Sustainable Development

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Speaker 1: Tech Reimagined, redefining the relationship between people and technology brought to you by Endava. This is Tech Reimagined.

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Bradley Howard : Hello everyone. I'm Bradley Howard. And welcome to the latest episode of Tech Reimagined. Today marks a special day in the history of technology. It's world's engineering day for sustainable development. As it's the special day, we've asked Tom Gruber to join our podcast and celebrate it with us. Tom, would you like to introduce yourself?

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Tom Gruber : Hi, Bradley. Thanks for having me on your show. Yes, I'm Tom Gruber. I'm a serial entrepreneur. My third company was called Siri and it was the Siri that Apple bought and made a product out of. I have done companies in music and travel and in collective intelligence, and I'm also an avid underwater photographer and ocean conservation advocate. So today's a special day for me too.

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Bradley Howard : Well, thank you very much and welcome to Tech Reimagined. So you're one of the biggest AI advocates on the web at the moment. What's your view on how AI can accelerate sustainable development?

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Tom Gruber : It's an interesting question because a lot of us, especially seeing the potential of AI to change so many things, think it's a good idea to align what projects we choose to do with AI around important goals. And the sustainable development goals are a great framework for that. And there's a lot of obvious things like for instance, good health and wellbeing. AI is really doing exciting things in healthcare right now. I can go into some of that later. Education, it turns out if you want to scale education to five billion people, a good way of doing that is to introduce a little bit of the intelligent automation so they can have good intelligent tutors. And also of course, economic growth, and particularly the phrase decent work. AI can transform what is currently really horrible, dangerous muscle work into much more of a mental work, but those are sort of high level things.
 It turns out that there was a study on this question of how AI can help sustainable development goals that was published in the very prestigious journal, Nature Communications, early 2000. And in this study, they actually systematically counted up, went through every target of every goal and said, could AI impact this positively or negatively? And surprisingly three fourths of the goals, of the targets in the SDGs, the authors made a case that that could be positively impacted by artificial intelligence.
 Now, there are examples like being able to use remote sensing data from satellite data and more effectively see what's happening with the Earth's resources, identifying illegal fishing, noticing where deserts are encroaching, looking where forests are being burned down and so on. That can be enhanced by AI, but there's a million other things like that, Healthcare, like I said. The interesting thing was that the authors also claimed that about a third of the targets could be negatively impacted. And people who are really interested in this subject, I suggest you read the article and you'll find out that actually the optimist should be getting a little more credit.

 The ways in which the authors claimed that the SDGs were negatively impacted were often based on misunderstandings about how AI works. So, for example, they said, well, it can help with climate change, but it uses a lot of computing, which we know causes us to consume energy, which then means that we're going to have carbon pollution. And then they cite the example of Bitcoin, which burns a lot of energy. And as you probably know, Bitcoin isn't AI. It doesn't use AI, has nothing to do with AI. And what most people don't understand is that AI does use a lot of computation when the models are created, but not when the models are deployed. So for instance, when we build a model that when you can say, Hey, Siri, it can take gobs of expensive computers to make the model, but then you can deploy it on every little watch, which just runs on a tiny battery.
 So, in fact, and I looked at some of the negative things that they were saying, it turns out that very few of the negativities are actually caused by AI technology. Almost all of the negative consequences that the authors pointed out were caused by the in equal access to resources and therefore the unequal access to the benefits of the economic progress that the AI is going to be reducing. And that's not caused by the AI. It's caused by the societies and the economic situations in which people find themselves, which deploys the technology. As an amplification, there is a productivity tool. So on whole, I actually think that it's a bright day for SDGs when we bring in AI, because it can actually make a lot of things that used to be hard to do on a global scale doable now.

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Bradley Howard : For some of our listeners and viewers, can you just explain what an SDG is?

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Tom Gruber : Oh, sorry. SDG stands for sustainable development goal and the United nations has done a great job at sort of putting together a set of these targets or these goals that things like good health and wellbeing, quality engineering, quality education, a decent work environment, equality, and gender, and so on. They're making the case that if we have all this well- intended nonprofit NGO activity, we should organize them around a common set of global goals that all of humanity can agree to. And that's what they've done here. So that essentially, it becomes sort of an ethical metric that non- profit work can measure itself against.

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Bradley Howard : So that's on what I would call kind of the centralized view of AI, but we've also got AI on our own consumer devices and laptops, et cetera. We've just had the pandemic. And we've discovered that the digital divide in the world has actually grown more than anything, where we've had children at home who didn't have laptops. So they've missed months of school. My wife works in a school and it's been heartbreaking hearing how many kids don't have access to any technology during that time. Do you think that AI is making that digital divide get wider and wider if they didn't have the latest devices, for example, to use those voice assistants or AI tools?

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Tom Gruber : It is true that AI is software and software has to be distributed over computers. There's a lot of work being done to give everybody on the planet, a smartphone and an internet connection. That's independent of AI, and it will have benefits for humanity, independent of whatever technology is running on top of it. I'm assuming, and a lot of people are assuming that that goal can be achieved separately from guidance over how other technologies are being used. It turns out that AI is actually quite

frugal in the use of compute technology and compute resources on the mobile device. Like I said before with the example of the watch, a very large model can be built in expensive headquarters machines and then deployed on a battery powered device. That's true of all the AI applications that I know of, including ones that do have fairly sophisticated things.

Example would be there's a company I'm working with called migraine. ai that's actually being able to build vital signs that by looking at a selfie video that any smartphone takes. So you take a normal smartphone and it takes a selfie video. And then from that, it can do infer, heart rate, heart rate variability, even things like fever and so on. And it's being used to do COVID detection now among populations. So what's interesting here is that the models again are expensive to build, but it doesn't even matter what even cheap smartphones, once you're in the smartphone category, you have enough. So I think AI will actually be a counter to the digital divide because it won't be the access to the best and the fanciest computers, just the minimum, because you can put everything else through the AI.

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Bradley Howard : Do you think that we could find ourselves in a world where a voice assistant or an AI bot might say to us, no, you don't want to do that because of the environmental impact or some other negative impact to the world.

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Tom Gruber : Well, absolutely. Actually, a friend of mine was a building a app right now to do a personalized carbon footprint, a metric that you could carry around with you. And can you just point it out a thing you want to buy or a use of energy or something, and it can tell you its effect on your sort of personal score as it were, or your personal budget. That kind of technology, again this is just an app, runs on an app store is really, really small and simple. And that's going to be very common. More sophisticated versions of that will be actually conversational agents that may discuss with you your choice. And that's the thing that can be done. If, for example, in my household, we often discuss what kinds of things are recyclable, which ways and how much work is it worth doing to out certain kinds of plastics from others and so on.

Now that's a conversation that should be had sort of kind of at headquarters as it were and have a policy built. And then you can implement that policy in a conversational bot that can explain to somebody that in your neighborhood, that is what they call aspirational recycling, that will make a difference, but in your neighborhood over here, it's really important that you keep those batteries out of the waste stream or something like that. And it can give that kind of knowledge in a friendly kind of conversational way.

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Bradley Howard : We've had some discussions in Endava about map routing is always based on the most efficient time. Okay. So time is always the key goal, but we worked with a lot of car insurance companies and it's quite surprising that they don't influence the mapping technologies to say, actually, please don't go through that area because that's an accident, a hotspot. So, safety would be one. But also you would almost expect by now that some of the map technologies would suggest another routes based on lower emissions from your vehicle, or even ask you what kind of vehicle so that it could make a decision for you on what would be the lower impact. That's really interesting. Do you think we'll get to that point where we will get different choices based on different types of impacts and parameters?

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Tom Gruber : Oh yeah. I mean, that's all completely technically doable right now. There's absolutely no reason it couldn't be done. It's just a matter of policy, economic environment. Is there a business in doing that as an app right now? Maybe, maybe not. But if a government made it attractive in some way, or actually even more than governments these days. I work with some insurance companies that actually now view themselves as much more of a nurturing stewards kind of partners with their customers, not just financial tech, financial instruments. And so they really want to help optimize people's overall wellbeing and longterm wellness. And in that sense, they're building, they're subsidizing the building of technology to help people achieve basic goals of wellness and manage chronic diseases and so.

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Bradley Howard : We've talked about all the benefits of AI, but what'd you think some of the risks of AI might be in sustainable development?

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Tom Gruber : Well, the biggest risk is that it's used by bad actors to disrupt and that's already happening. And we saw that the dark money often funded by and today, it was the dark money came from a lot of from petrol chemical industry, but just dirty industry, funded a lot of propaganda in the United States in particular. And it reached the Brexit election as well, or this money funded the paid commerce, the paid commercial propaganda that undermined society's belief in evidence and science and responsible journalism. Oh, it's all fake news, or I can believe whatever I want about climate change. These kinds of things came from paid propaganda.
 And so that machine has AI in it. By the time it hits YouTube or Facebook, they're buying ads, they're promoting organic search as well. They're doing things to make them click worthy. The flywheel of downward spiral, misinformation and all that stuff is being amplified by these AI machines that are basically keeping people addicted. So we need to be careful about the bad actors and they have access to the technology, just like the good guys. And so it's not about the tech so much as it's about how it's being used.

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Bradley Howard : And what are your hopes for AI to contribute to a better world? You mentioned some other examples that were available here and now. Where do you want to get to?

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Tom Gruber : Well, I mean, the number one thing is that we have this incredible bounty of technological progress, and yet most people aren't even aware of it or have access to it because of various things, ignorance, or just too much hassle, it's too much trouble. AI is a kind of a general accessibility machine. We saw that in Siri. Siri could make the act of figuring out how to find an app or a set of apps and coordinate them together to help even something as simple as just getting a restaurant reservation, you could do it in one voice command.
 And so that's the kind of thing that'll happen. Let's say that we want to do this thing, like help me decide which product to buy based on my environmental goals or whatever. These are going to be routine if we have the motivation to do so. And that means that just like Google's, remember Google's mission? Google the greatest information tech company in the world, their mission was to make the information of the world universally accessible. They use that word, universally accessible to everyone. Well, I think the AI is

going to create the ability for the intelligence of the world to be accessible to anyone. And our challenge here is to make sure that the intelligence is being used to promote the truth and not misinformation and not propaganda.

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Bradley Howard : The truth is a really gray area. You might have a view of a particular truth about something. And I might have a slightly different view of the truth. So how do we expect AI to get to the middle of that?

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Tom Gruber : Well, there's some things we do agree on. I mean, Trump, they have a tally of how many times he lies per day. I mean, the lies that comes out of that man's mouth are documented facts. So there's no question there's a sort of a floor, a lower end than truth. And then there's the higher end with like, okay, how much of climate change is caused by greenhouse effects versus methane versus this, permafrost there is multi... But that's not whether humans are causing it, it's how and how much. And of course the AI doesn't have to know those subtleties. It has to know how to take the recognized known propaganda, known falsely known misinformation, which can be labeled by humans. I'll tell you what. I'll give an example. The way the spam was solved, the spam problem of email. Most email would be spam today if it wasn't solved. It was solved by companies like Google and the way they did it was they recognized that spam has no value. It can't transmit itself as a virus, unless it has a call to action. If you just read the spam and you don't do anything, it has no use at all and it will die. So spam always has to get you to do something and that signal of getting you to do something is what they use to identify the spam. It doesn't even matter which. There's a million different ways. So that's the same thing with AI. The AI can be used to detect that this information is being used to manipulate you in a way, and the AI may not know the actual subtlety of the technique, but it knows that that's the intent and they can label it. And then if necessary, have humans review what's going on and then either shut it down or let it go.

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Bradley Howard : So I think the answer was you think AI can do a little bit more for even better spam.

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Tom Gruber : Well and misinformation and propaganda. Yeah. Yeah. So we need to change the cure. I mean, this is sustainable development day, right? We have to remember that in five years we got hoodwinked. In five years, the growth of social media on mobile happened. And in those five years, two billion people got addicted to believing stuff about climate change they didn't believe five years earlier. So this thing happened quickly. It can unhappen. There's been a lot of damage, but memes now travel fast on the internet. And memes is kind of a low end version of information transfer, right? I mean, sometimes they're false memes, but you can actually transfer truth and enlightenment as well. So I think a lot of people are working on that, but that's the goal here. And effectively, the big picture I see to bring AI back into the picture again, is that AI can shore up human frailty, right?
So if I don't have good vision, I can wear glasses. If I don't have a good ability to do speech, I have AI that helps me speak for me now. If I want to be in a wheelchair that it needs robotic control, I can use AI to help with that. Well, I can also have AI help us be smarter as collective. So it turns out we are collectively making some big boo-boos, big mistakes about climate, big mistakes about governance and so on. And that AI can

actually help overcome some of the reasons why we are making those mistakes collectively and help us collectively make better decisions. And I think that's the next wave of human augmentation by technology.

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Bradley Howard : On that note, thank you so much for joining us today, Tom. It's been absolutely fantastic on this very special day. To all of our viewers and listeners, hope you've enjoyed this episode of Tech Reimagined with Tom Gruber. If you liked today's topic, please remember to show us some love by liking this podcast on your favorite platform. Please, don't forget to subscribe. Tune in next week for another exciting episode. If you've got any further questions or want to get in touch, please go to endava. com and click on the contact us page on the right- hand side. I'm Bradley Howard. This has been Tech Reimagined. Thanks for listening.