TEDxMIT at CSAIL
May 28, 2019
Daniela Rus

Over the next few decades, humanity has some major challenges to contend with: climate change, curing disease, ending inequality, ensuring sustainability, eliminating poverty. It would be easy to look at this list and feel disheartened.

But I don't. I feel hopeful. Because when I look around, I see the many ways in which technology has made the world better. Just imagine a day without the Internet, the World Wide Web, the Smart Phone, and everything they enable. No access to information. No digital media. No social media. No online shopping. No GPS. No diagnostic imaging. I can also imagine the doors technology will open for the future.

That's not to say there won't be challenges. There will be, and we'll need to create new science, technologies and solutions. We will have to be thoughtful about the consequences of our work. We'll have to ensure that advancements serve the greater good and that everyone would have the opportunity to benefit from the future that technology offers. It's our responsibility to make sure that happens.

Next, you'll hear from some incredible speakers who are helping lead this charge. Their accomplishments speak for themselves—as does their commitment to pushing our field—and its impact on the world—forward.

You may also notice one other commonality—our speakers are all women. It's not a coincidence. As we planned this event, we made an intentional decision to highlight what these great women researchers from MIT have brought to the world. And to reflect upon how much more we could collectively accomplish if men and women were equal participants in advancing technology and making the world better through technology.

As you listen to today's speakers, and reflect, you may find yourself surprised that women are still underrepresented in technology. And yet, the numbers are undeniable.

According to a 2018 McKinsey study, women account for only 26% of the computing workforce.[1] Even worse, that number has actually fallen over the past 15 years while women made big gains in other fields.[2] For example, more than one in three lawyers

[1] https://www.mckinsey.com/industries/high-tech/our-insights/closing-the-tech-gender-gap-through-philanthropy-and-corporate-social-responsibility

[2] https://www.theatlantic.com/magazine/archive/2017/04/why-is-silicon-valley-so-awful-to-women/517788/

are now women, compared to fewer than 1 in 10 in 1974[3]; and 2018 marked the first class of medical students that was majority female in the USA.[4]

When we consider the work of the future, computation, technology, science, and engineering will play a central role. These fields are essential, along with other important skills like communication, collaboration, critical thinking, and creativity, among others. When we ask our kids what they want to be when they grow up, I wish we could hear boys and girls alike say things like astronaut, climatologist, neuroscientist, roboticist, computer scientist…

It may not sound like the obvious choice, but the way I see it, those of us who know how to make things AND "breathe life" into those things through programming have superpowers. We can make real the things we imagine. And who wouldn't want to do that?

For me, technology was an obvious choice. I grew up in a family of scientists. My father built the first computers in Romania, and my mother was a professor of physics. It always seemed like STEM was in my DNA.

As a school student, I was interested in art, history, geology, literature, math and just about anything else I could get my hands on. But the constraints of growing up in Romania—and being good at math and physics—put me directly on the STEM track.

At that time, it was standard practice for all high-school age students to spend a week each month working in a factory. The Romanian government believed this would help us get some trade skills and prepare us to become part of the proletariat.

For some time, one week each month, I worked in a factory that made spare parts for locomotives. I was a teenager and this work didn't feel very useful—to me, or to the factory workers who didn't seem to want us there.

But as I look back, I can now see the ways in which that experience contributed to my own career journey. I learned to use machines such the lathe. I made screws from scratch. I began to understand the physical aspects of making things.

As the math we learned in school became more abstract, I realized that I wanted to do something related to STEM, yes, but something with a physical component.

Now, here I am at MIT, living my dream, getting to build robots that bring together the world of computation and the physical world of mechanisms and materials. And also thinking about how to ensure that young girls discover the same excitement of

[3] https://blog.dol.gov/2017/03/01/12-stats-about-working-women
[4] https://www.washingtonpost.com/local/social-issues/women-are-now-a-majority-of-entering-medical-students-nationwide/2018/01/22/b2eb00e8-f22e-11e7-b3bf-ab90a706e175_story.html?noredirect=on&utm_term=.31d0c8693493

making things—preferably *without* the rigid education of factory jobs in 20th century Romania.

Every woman you hear from today will bring her own story, her own accomplishments, and her own unique perspective to this stage. That kind of inclusion is exactly what we need in technology: to make women's voices, experiences, and expertise count equally.

It's the right thing to do—and it's the best thing for our field and for the world. The research is clear: if you value innovation and new ideas—as our fields should and must—diversity is crucial. Studies have shown that not only do additional voices bring more ideas, but that *the act of adding diversity* to a group helps people see that different perspectives exist and therefore adapt their behavior. Diversity encourages people to anticipate different perspectives, work harder to reach a consensus, and often achieve better outcomes.[5]

But diversity alone isn't enough. We're all aware of the dynamics that push women out of technology at a much higher rate than men.[6] Studies have shown that women struggle to get the same opportunities for career advancement or even the same pay as their male counterparts.[7] Many feel excluded by a sexist work culture.[8] And few fail to notice the lack of women in senior leadership roles in most technology organizations.[9]

It's up to us—the people, the researchers, the professors, the students, the entrepreneurs, and the business leaders—to cause change, to create a truly inclusive environment where everyone feels part of the whole. When we achieve that type of inclusion, we'll be able to focus on what's achievable rather than who is in the room. And that's exactly what we need if we're going to take advantage of all that computing, science, engineering, and broadly speaking technology can help us: (1) accomplish, and (2) ensure that the outcomes benefit the greater good.

Whether we're pursuing the future of algorithms, tailoring hardware to machine learning, increasing accessibility, building truly intelligent machines, imagining the future of industries from fashion to food to retail to manufacturing to exploration and—yes—solving many of the world's biggest problems, we need all the talent, creativity, and diversity of experiences that women bring to the table.

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[5] https://www.scientificamerican.com/article/how-diversity-makes-us-smarter/

[6] https://futurism.com/tech-industrys-gender-problem-hurting-women

[7] https://www.fastcompany.com/90274067/this-is-why-women-leave-jobs-in-tech

[8] https://www.theatlantic.com/magazine/archive/2017/04/why-is-silicon-valley-so-awful-to-women/517788/

[9] https://www.oecd-forum.org/users/91062-tarah-wheeler/posts/31567-leaving-at-lightspeed-the-number-of-senior-women-in-tech-is-decreasing

We need to educate all children, girls and boys, equally on the opportunities available in these fields, give them the chance to shine, and ensure that we're creating inclusive environments for them to work in. As I like to put it, computational thinking and computational making should be part of literacy in the 21st century.

As you listen to all these incredible women over the course of today, think about how much richer we all are because they chose to pursue their passion for technology. Each of the speakers has big dreams with transformative impact.

Barbara Liskov invented the first object-oriented programming language, which is the foundation of the software industry. Julie Shah is enabling people and machines to work side-by-side in manufacturing. Nergis Mavalvala is uncovering how the universe started. Krystyn Van Vliet is inventing the future of manufacturing. Vivienne Sze is inventing new computers tailored for machine learning. Ronitt Rubinfeld invented sublinear time algorithms, which ushered in the age of big data. Judy Brewer is on a quest to ensure technological inclusion for people with disabilities. Dava Newman is creating the technologies that will take us to the stars, and Hamsa Balakrishnan is laying the foundations for turning transportation into a utility available to anybody anytime!

Now it's our turn to ask how we can ensure the next generation has an opportunity to make the same kind of impact. To paraphrase our hometown hero President John F. Kennedy, we need to prepare young girls to see both what technology can do for them—and what **they** can **do** for technology. I can't wait to hear from our extraordinary women engineers and scientists from MIT.

Thank you.