UNIT 7 Audioscript

CONNECT to the topic page 62

Host Andy Davis: This week, we're looking at new technologies. Today my guest is Professor William Mancini. Good afternoon, Professor.

Guest Prof. William Mancini: Hello Andy.

Host: Now, you call yourself an applied science technologist. What is that?

Guest: Well, it's somebody who looks at using scientific knowledge to solve practical problems. We think about the relationship between new technologies and life, society, and the environment.

Host: Interesting. Now I know you've written a lot about what you see as some of the key emerging technologies. Can you give us a glimpse of some of these?

Guest: Sure. Well certainly one thing is "big data" analysis. You know, as technology develops, the amount of data we're producing is increasing rapidly, and the way that we analyze big data helps us make important decisions in commerce, in politics, in medicine, in education. It's huge.

Host: So applied science technologists deal with big data analysis?

Guest: Absolutely. And we do this through what we call the Network of Things—the connected network of physical objects containing electronics, software, and sensors that allow data to be exchanged. By 2022, it's estimated that there'll be a network of 50 billion connected objects. And that means, for example, that when paired with artificial intelligence technology, factories will become smarter and more efficient.

Host: Meaning what?

Guest: Meaning an additional $2 trillion in the global economy.

Host: Now you mentioned artificial intelligence. What do you predict there?

Guest: Well, there's been major progress with artificial intelligence—AI—in recent years.

Host: Creating intelligent robots?

Guest: Moving in that direction, but we're not close to creating a truly intelligent robot in my opinion. For sure though, robots will continue to move out of the industrial and scientific worlds and into our daily lives … kind of like how computers spread to the home in the 1980s.

Host: We've got time for just one more example of emerging technologies. What?

Guest: I'd say 3-D printing—the process of making three-dimensional solid objects from a digital file.

3-D printers will transform industries as the printers become cheaper. Already they're a $3.1 billion industry. And that's growing by 35 percent each year. But, you know, there are so many other exciting technologies out there: biotechnology and nanomaterials, for example, and … .

Host: Indeed, but sadly we'll have to finish there. Professor, thank you.

FOCUS your attention page 65

Speaker: A lot of people get nervous about the idea of artificial intelligence. But there are a couple of misconceptions I'd like to point out—two misguided ideas that are closely connected. *First*, when people think of AI, they picture spooky robots—human-like machines that could threaten humankind. However, the robots aren't really the AI; the AI is actually the human-engineered computer *inside* the robot, and most of us don't seem to have a problem with smart computers, right? Basically, the AI is the brain—the human-designed brain—and the robot the body or container. The *second* misconception is that, while we might not realize it, we use AI in our daily lives all the time. We use it in cars; for example, in automatic braking and fuel systems. We use it in cell phones when we navigate using our map apps, when we get music recommendations or tomorrow's weather. And search engines use it to rank pages and recommend products especially for you. So, it's not something new. …

WATCH the lecture page 66

Professor Helena Sonin: E01 As I promised last time, today I'm going to talk about artificial intelligence. Or what people often call *AI*. For sure, artificial intelligence is a subject people tend to feel strongly about—and not just the scientific community, but sociologists and philosophers and economists, as well as the average person. And although this topic has received a lot of attention lately, in fact, AI has always been controversial. Back in the late 1970s, the workers' unions fought against the introduction of robots in car manufacturing plants because robots were putting a lot of people out of work. And you have to ask: Why did the introduction of robots on assembly lines appeal to management? Of course, the bottom line is economics. Basically, the robots were more efficient and more reliable. They didn't ask for pay raises and they didn't get sick, or skip a day of work to watch the World Cup final, right?! Well, how quickly things change: Today we don't give robots in manufacturing plants a second thought. They're part of our culture now. And that's something to keep in mind as we talk about AI: how

attitudes change over time as people get used to new technologies and how new generations see existing technologies as perfectly normal. **E02** So, we're going to explore the benefits and risks of AI. But before we do that, we want to understand the distinction that's often made between a *weak* form of AI and a *strong* form of AI. Weak AI refers to an intelligence system that is *un*thinking, *un*conscious, and has *no* self-awareness. It simply does something—usually a single task. Here I'm talking about vacuuming the home, navigating a route, parking your car for you, playing chess against you. A single task. A weak AI system does not have *real* intelligence in the way a human being does. They have no awareness of what they're doing and no choice of whether or not to do it. OK? That's the weak version of AI. **E03** Strong AI, on the other hand, is more the stuff of sci-fi movies. Strong AI refers to an artificial consciousness. Strong AI is oriented toward creating a thinking, conscious machine that seems to be equivalent to a human being. A strong AI system knows it exists and wants to continue to exist and even evolve. If you've ever seen the classic sci-fi movies *2001: A Space Odyssey*, *i-Robot*, *The Terminator*, or *Her*, you'll know what I'm talking about. The AI is developing a meaningful, even overpowering relationship with their human "masters." **E04** As you can imagine, people don't worry so much about the weak form of AI. It's generally the strong form that gets people nervous. They imagine AI robots, for example, becoming smarter than human beings, developing themselves beyond the control of human beings, maybe leaving humankind out of control of its own destiny. Some writers have even claimed that robots will reach human levels of intelligence and consciousness within the next 10 or 15 years—a moment that has been described as "technological singularity." This means the point where robots begin to outsmart humans by redesigning themselves, without any further human input. And hey, that's a pretty scary thought, right? **E05** So, that's the big picture. But let's now go to some specifics. What are some of the particular benefits of AI? And what are the risks of AI? Let's look at just a couple of the benefits first. The first advantage I'd like to mention is the ability of AI-driven machines to deal with *difficult, complex, and dangerous tasks that are currently done by humans. You can already see this, for example, with bomb disposal or the exploration of new planets*. Also on the plus side, there's the very real possibility that AI could lead to sophisticated techniques that would help us address global problems such as the depletion of natural resources, pollution, and climate change. For example, there are now robots that can go to the source of an oil spill in the ocean immediately rather than waiting for days or weeks for humans to address the problem. And scrubber robots are being developed that can suck CO_2 out of the atmosphere. Clever stuff! **E06** Although the potential benefits of AI are virtually limitless, a lot of people have been skeptical about the unbridled development of AI. One of the things AI skeptics have zeroed in on is the fact that machines lack emotion. Without

emotion, an AI robot will not be able to sympathize with individuals and their unique situations—something that's essentially human and which most of us are very good at. This lack of emotion may lead machines to act over-rationally and, consequently, at odds with human interests. A computer-led future would likely be a very cold, impersonal one in that sense. **E07** Next is the concern about replacing and "downsizing" humans. We've seen how robots can free up humans to do other things—think back to those car factory workers. Right? The robots freed them from the monotony of assembly line work. Trouble is, although this "freedom" might seem like a good thing, it could also have a downside and lead to feelings of uselessness. And that could trigger mental illness, obesity, and other health and social problems. So that's another area of concern. **E08** And finally, there's the moral argument—a big one, especially in some religious communities. Some people believe that intelligence, intuition, and self-awareness are the universe's gift to humankind, and to try to replicate or even improve on them is like "fooling with mother nature." It's morally wrong. **E09** All right, so where are we with all this? Well, we can't turn the clock back and "uninvent" artificial intelligence. Nope, that genie's out of the bottle, and let's face it, you can't stop progress. Progress takes on a life of its own. So, perhaps instead of being reactionary, we need to get ahead of this thing. In other words, we—all of us—need to think about how we want AI to develop in the future and what the implications might be for human life. We need to understand the technology so that we can control it and help make certain that it's a benefit to humankind rather than a threat. And, of course, that's not just about the technology itself—it's also about being responsible as human beings in how we use it. And that's a topic we'll deal with next time.

TALK about the topic page 69

Shelley: Hi, everybody. So, I guess I'm the group leader today. So we're trying to discuss AI, pros and cons, OK?

Ben: Right. So, I think there are a lot of …

Shelley: Wait a second Ben, I just want to set the goal here, OK? So, we're going to come up with a list of reasons to support or oppose Artificial Intelligence. So, Ben, you can start.

Ben: OK, sure. So I think, to me, this whole AI thing is pretty disturbing. I think we can all agree it's getting kind of spooky.

Kenzie: Yeah, I'm with you on that. "Spooky" is the right word. I mean, I used to think that having smart robots to help humans would be so cool.

Hugh: What do you mean by "cool"?

Ben: I think having robots might make our lives easier, smarter. More entertaining.

Shelley: But it sounds like, Kenzie, you don't feel that way? At least not right now?

Kenzie: No, no, I don't. After listening to that lecture, I'm not sure that being surrounded by intelligent machines is such a good idea.

Hugh: But you want to be surrounded by intelligent people, don't you?

Kenzie: Well, yeah, but that's different.

Ben: You know, maybe we're all overreacting a little.

Hugh: Yeah, maybe we're just thinking of those sci-fi movies like *The Terminator* or *Blade Runner*, where the robots get out of control. But that stuff is fiction—it's not real.

Kenzie: I get your point, but some of those movies are pretty close to reality.

Shelley: Like what? What's an example?

Kenzie: Well, like in *2001: A Space Odyssey*. It's kind of an old movie now—but it shows that a robot can make decisions by itself, even if the decision isn't good for humans.

Hugh: Yes, actually, that does scare me, too.

Shelley: OK, so we can say this: One reason to oppose AI is that AI robots can make decisions that are bad for people. OK? Any other reasons to oppose AI?