Artificial Intelligence – indistinguishability from humans is still far away

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What are the chances that humanity is outsmarted by 'Artificial Intelligence' ?

Tomaso Poggio (laughs): Very low. Our research at the center of Brain and Cognitive Sciences at MIT attempts to go beyond the applications of machine learning and is trying to understand intelligence and how the brain produces information. What we will not see in the next five to ten or even thirty years, is that machines are as intelligent as one of us – with this, I mean indistinguishable from a human being. Understanding the brain is one of the most significant challenges in science today, together with the problem of understanding the origin of the universe, the source of life, the nature of space and time, and the structure of matter. But I think once we make progress in understanding intelligence and we can make ourselves smarter or create machines that help us to think better. It will be easier to solve all the other big problems in science. So I guess this is the primary problem: understanding intelligence – how the brain generates it and how to replicate it in machines. It also means understanding ourselves in a very particular sense. Humanity has been after this ambitious task – from a philosophic point of view – for at least 2000 years.

What are the most significant changes in our daily lives during the next 10 to 15 years, that we can expect, concerning

the findings in the field of artificial intelligence?

Poggio: There are already several solutions for problems that help us facilitate our daily lives or entertain us, like Deep Blue grandmasters of chess and computers that win at Jeopardy. The work I was involved in over that last decade was developing algorithms for face detection in digital cameras, for example. We also developed further algorithms for finding pedestrians in images of the road. This technology is used now by the Israeli company Mobileye which provides cameras for car manufacturers like General Motors, BMW, or Audi.

Orcam, for example, developed a system to help visually impaired people with macula degeneration. They produce glasses that will read, speak, and recognize objects. Those glasses will be on sale in the US in a couple of months.

Over the next decade, many more applications like this will penetrate our daily lives, systems that can drive a car, speech recognition, systems that can translate from one system to another, and many more. But all of them are at human-level performance only in a narrow domain of intelligence; none can be called intelligent as they only cover a fragment of human intelligence.

Do we face risks by applying these systems and relying on them?

Poggio: The scenario, that appears in several movies and is mostly quoted when it comes to artificial intelligence, is the risk of machines that will suddenly become more intelligent than us and take over.

(smiles) I think this is very unlikely for several reasons. A more realistic danger we have to protect ourselves is the possibility of malicious software entering computer-driven cars by hackers and other examples like this.

That would be the typical danger that any software has to

face?

Poggio: Yes, but of course, as software becomes more responsible, it also becomes more critical. It´s one thing if a computer virus makes your pc crash, it´s another thing if a computer virus makes your car crash, especially if you are driving a hundred miles an hour on the motorway.

Are there new jobs that can derive from the field of artificial intelligence?

Poggio: Until five years ago, the field of statistics was not very sought after. But now suddenly, because statistics is related to machine learning and big data, statisticians are becoming rock stars. But I think in the short term, there will be more jobs lost because of computers than jobs gained. And I think that this is the real risk for the next decade: machines are going to take over more and more jobs. The positions of engineers, statisticians, and people who design computers will still be save on one hand. On the other hand, handymen like plumber, gardener, or electricians are difficult to replace by machines for a while. Everything in the middle, pilots, surgeons, financial advisors are replaceable – not all of them, but the demand will decrease. Its a funny problem because if the cost of energy remains low, the economy will be as productive as before or even more productive, but people need to work less. It´s just that economy is not built this way.

One of the human core values is creativity – is it possible that machines produce creative outcomes?

Poggio: I think we are overestimating creativity. I guess for good evolutionary reasons; we attribute to people a lot of things that are just chance. I don´t see why machines could not be creative. It will probably take longer to develop devices in this sense, but I don´t see any principal reason why this should be impossible.

What is your vision?

Poggio: I´ve always been intrigued by the question: What is intelligence? When I was a child, I marveled at Einstein and how a brain like the one of Einstein could exist. There are many big problems in the world, and a lifetime is not long enough to understand and solve all of them. But understanding intelligence and making the brain smarter or helping the brain to become more intelligent by the use of smart machines, is the foundation to solve all other problems. Even a partial solution to the problem of intelligence has enormous potential benefits for our society, technology, and the economy. It´s fascinating being able to work on this process.

Tomaso Poggio speaks at the MIT conference Vienna 2015, march 25-26
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