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No Need to Worry!

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A balanced and realistic discussion on what digitalisation can and cannot achieve in the years to come will help to dispel fears, says Roland Siegwart.

Where will digitalisation be in ten years' time? A very difficult question indeed. When it comes to the future of digitalisation, realistic ideas and utopian visions become intermingled with fears and hopes. I think it's high time to add some structure to the discussion, and I'll venture to try.

Total digital immersion

Digitalisation already pervades much of our lives. This means that data is more efficiently and reliably analysed, interlinked and available on mobile devices from anywhere. No one wants to do without the benefits of Google Maps or electronic train timetables.
This kind of digitalisation will continue to advance and make people's lives easier – simply because this is what people want, and technology continues to deliver new solutions in response. If in ten years we can vote with secure e-ballots instead of having to fill out tedious forms, then I'm the last one to oppose this.

What can artificial intelligence deliver?

There is also a heated debate about artificial intelligence (AI) and self-learning systems. AI indeed continues to pull off ever more impressive feats: A year ago, for example, Google's DeepMind algorithms succeeded in beating the world champion in the highly complex board game of Go. Deep learning can optimise output (such as identifying cancerous tissue) based on relevant input (many images of cancerous tissue). Computers are better than humans in this regard, because they can access and process large volumes of data much faster.
But I think some AI experts – and especially non-experts – go too far when they put the achievements of AI on a pedestal and create false expectations. Today's AI systems are very limited in their abilities and can be applied only to structurable problems. I have yet to see an AI program that is able to comprehend the complexity of our real environment even on an elementary level or come up with completely new ideas. It remains to be seen what will be possible in ten years and, of course, what will not.

The dream of self-driving vehicles

"Will we see self-driving cars on the streets in a few years?" It's a question people often ask me and that I can answer with an emphatic "yes and no". Technologically speaking, it is already possible for a car to drive autonomously on the motorway or find a spot in a car park. But it will be a long time before cars can correctly navigate the chaotic Central intersection in the heart of Zurich during rush hour traffic. Why?
Motorways and car parks are very structured environments built specifically for cars. So a self-driving car only has to reliably identify a limited number of objects and situations. In contrast, a self-driving car will encounter a virtually unlimited number of challenges at the Central intersection in Zurich: pedestrians, cyclists, dogs, trams, other drivers' signals and many others requiring reliable interpretation. Even the latest trials and successes cannot hide the fact that self-driving cars still have a long way to go before they can navigate streets everywhere.

Robots are still unable to comprehend their environment

In short, despite very extensive research efforts in AI and robotics, robots still have not developed "intelligence" over the last several decades. In contrast to the realms of data analysis and strategic games, autonomous robots need a human-like comprehension of their environment. Robotics goes beyond simply having good AI algorithms; what is needed is multi-modal perception that enables reliable decisions based on partial information, in turn allowing for precise interaction with a complex and dynamic environment. We're still far from this.

Exaggerated predictions

So I think it's exaggerated and ridiculous when people predict that robots will replace people in many places in the next 10 or 20 years. How many robots have you met that can cut your hair, repair your washing machine or lay new tiles in your bathroom?
What I imagine instead is that digitalisation, AI, and particularly robots will achieve incremental advances that will make certain tasks more efficient and reliable. But they are certainly unlikely to become as creative and interactive as humans in the coming decades. So there is no reason to fear that robots will take all our jobs or even take over the world.
This is why we need to view AI and robotics technology with a critical eye, while at the same time taking advantage of the opportunities they offer, so that they can do dangerous jobs, make our streets safer as well as make agriculture more efficient and sustainable. When applied in the right way, AI and robotics can make the world a better place for everyone.

This article was first published on "ETH Zurich Zukunftsblog".

***About the author**: Roland Siegwart is a professor for autonomous mobile robots at ETH Zurich and founding co-director of the Wyss Zurich. He is currently Head of ETH Zurich's Institute for Robotics and Intelligent Systems. Siegwart also studied mechanical engineering at ETH Zurich, spent ten years as a professor at EPFL Lausanne, and held visiting positions at Stanford University and NASA Ames. He was also Vice President of Research and Corporate Relations at ETH Zurich from 2010-2014. Siegwart co-founded a half a dozen spin-off companies. He also strongly supports and promotes innovation and entrepreneurship in Switzerland.*

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