Collaborating with machines will be increasingly important
Mats Lewan

As artificial intelligence is growing increasingly capable, collaboration between humans and machines is becoming more and more important. One critical aspect of such collaboration is context. That was one of the conclusions at a panel on AI, organized by EIT Digital Stockholm Node in collaboration with KTH Kista, on September 14, 2017. The panel was part of a seminar series in which experts from the academia and the industrial sector were invited to discuss hot topics in the field of digital transformation.

Mats Lewan, Daniel Gillblad, Kai Hübner och Anne Håkansson *at the EIT Digital Sweden CLC*

Foto: Loredana Cerrato

I had the honor to moderate the AI panel entitled *Advanced AI User Interfaces* with panelists **Anne Håkansson**, Associate Professor in Computer Science at KTH, focusing on AI, knowledge based expert systems and negotiations between AI based systems, **Daniel Gillblad**, senior AI researcher at the Swedish research Institute RISE SICS, and **Kai Hübner**, Co-Founder and CTO at the start-up Gleechi, developing technology for virtual and physical movements of hands.

Already at the start of the discussion, the panelists pointed out that despite a series of eye-catching examples of progress in AI based technology in the last few years, specifically with self-learning systems built on the concept of *deep learning*, the underlying technologies and methods are not new. Instead, the recent progress is largely due to a significant increase in the amounts of available training data and to more powerful computers.

The panelists also emphasized the importance of awareness of possible errors in the output from otherwise seemingly accurate AI based algorithms. Anne Håkansson reminded us that no matter how accurate algorithms might be, their output is always a statistic evaluation, which always includes a risk of be wrong.

Daniel Gillblad addressed the concern that AI systems can make biased decisions, simply because the data they have been trained on might contain biases, e.g. against race, ethnicity or gender. The problem is that once such systems are trained they essentially become black boxes, which are very difficult to analyze.

One key to solve this issue is the increased capacity in AI systems to handle natural language. Using natural language, AI systems could be designed to explain themselves in different ways, either by presenting a logic model of their way of processing data, as a kind of a story, or by answering questions.

And while a storytelling capacity would be a way to keep humans in the loop in advanced AI based systems, the opposite is also of great importance—finding ways and methods for humans to teach AI systems effectively, explaining reality to them, as we would explain it to other humans.

This is one aspect of what's being discussed more and more with regard to AI—how machines and humans can collaborate, rather than following the dystopian Hollywood-like fear that machines will threaten humans, first taking our jobs and then conquering our world too, with supreme power and intelligence.

Ironically, making machines collaborate with each other is a challenge in itself, which Anne Håkansson focuses on in her research, investigating independent systems that manage autonomous systems and resolve conflicts between them. Collaboration between machines and humans takes this to the next level.

Daniel Gillblad highlighted the increasing importance of context for building and training relevant AI based systems. One example is autonomous cars—it's not sufficient for such cars being able to navigate and drive on all sorts of roads in all sorts of conditions. They must also be able to interact with people in all kinds of situations where human drivers interact with other humans today.

But making interaction between humans and machines more natural is just one desired outcome of collaboration. Another is increased performance—it's well known that the best chess teams today consist of humans and machines together, and it can be assumed that a well developed collaboration between machines and humans will be a powerful combination in most fields, from business and public administration to academic research and art.

"Machines have changed human society because they complement it. Machines have greater strength, precision, speed and repeatability and thus created the industrialization leap. I think this is a good example on how also AI can in a similar way complement human society—being better at summarizing big amounts of data and helping humans understand it to improve human society," Kai Hübner commented.

AI systems of today are still narrow, in the meaning that they are specialized on a specific task such as image recognition or language translation. In many fields, though, machines are already outperforming humans at their specific task.

Humans, on the other hand, are still superior at understanding broad perspectives, integrating results from different domains and drawing conclusions, combining different insights. In four specific areas humans will also prevail over machines for quite some time—creativity, capacity to motivate and convince other people, empathy and fine dexterity.

A general advice for both individuals and businesses is therefore to try to build a collaboration with machines, first asking what machines can do better, which will often be repetitive tasks that humans would rather have a machine do for them, then analyzing how humans could use the liberated time expanding into tasks related to one of those four areas, or performing cross-functional tasks.

This strategy has several advantages. One is that it will lead to increased productivity, another is that it avoids laying off people in organizations where some tasks are automated by AI, a third is that it decreases the fear for machines as hostile competitors to humans, thus improving our possibilities to embrace AI based technology and shape it to something that is useful and positive for individuals, businesses and society.

This should also put us in a better position, as AI technology grows increasingly powerful. Which naturally leads to the final question I asked the panel: Will we ever be able to build human level AI?

Anne Håkansson answered that while she had always been fairly skeptical to that, she recently started to change her mind. Daniel Gillberg, however, noted that even though it most probably will be possible, we still don't have a clue of how to get there, so the question of a time frame for reaching human level AI is still very unclear. Meanwhile, the best we can do is making AI our friend.

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