Future living with AI and IA

BNAIC –BNVKI: FACt

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Good morning!

Before I start with my talk, I would like to say many thanks to the BeNeLux Association for Artificial Intelligence for allowing me to speak at this event.

Forty years ago, when I was still at school, I got to know to a short story by Isaac Asimov. The story was about 'Reason', which was published in 1941 and which already - at that time - opened the visionary ideas to the society about our future with something more or less unknown : Artificial Intelligence.

Since the year of publishing, 'Reason' has often been quoted as a reference with regard to the so-called 'Three Asimov Laws', which are:

- First, *a robot must not injure a human being or allow a human being to come to harm through inaction*.
- Second: *a robot must obey the orders of humans, unless these orders would contradict the first law*.
- And, third: *a robot must protect its own existence as long as this protection does not violate the first or second law*.

`Reason' is about a two-man spaceship crew and about Cutie, a robot, which or who, from a certain point on, perceives human commands as inferior and claims (loosely based on Descartes) that *he himself exists because he thinks*.

Cutie also argues to be superior to humans, because, for example, there is no need for sleep breaks, less prone to errors, and a performing of executable tasks more reliably and precisely.

When we read ‘Reason’, we learn that the space crew firstly tries to dissuade Cutie from these thoughts and to convince Cutie of their reality. But, all the arguments do not help and turning Cutie off also fails.

The situation comes to a head when a life-threatening situation arises that threatens to harm not only the spaceship, but the entire Earth. But, then, the two astronauts realise that despite all the dangers and problems with Cutie, all the machines keep working perfectly and that both the spaceship and the Earth still exist.

And, they come to the realisation that Cutie, although he was not aware of it, had been strictly following one rule all along: people must not come to harm. The astronauts conclude that they are in ‘good hands’ and need not do anything for the rest of their service, which means: they become superfluous.

Incidentally, the fact that Cutie disobeys human orders does not contradict Asimov's second law, for in Cutie's logic, he – as the prophet (as he sees himself) – is "more intelligent" than humans such that the disregard for human orders is thus due to the task of keeping people from endangering themselves.

‘Reason' ends with another team replacing the two astronauts, while Cutie remains on board.

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You may ask yourself now why I am telling you all of this? Well, the answer is quite simple. The question is to me, whether we, who live in the "here and now" and who are not part of this science fiction story, also become superfluous at some day? Will we not at some point, as part of a creeping process, leave our world and our lives in the hands of something or someone else?

In fact, the short story is a scenario for what developments our research can bring. On the one hand, there is the crew, Powell and Donovan, as well as Cutie. All represent a future scenario (albeit in a closed world) and embodying the theme of AI.

On the other side is Earth, the ‘here and now’, which describes an evolving scenario in which we, the humans, have it in our own hands to shape our future. Whereas the term AI is right in the situation in the space capsule, we should better say ‘IA’ in our world here and today - where IA stands for these little intelligent assistants, software and hardware beasts that seem to be exceedingly useful. In fact, the terminology used in fields outside academia, leads to a misunderstanding of the matter.

The winner of the Science Slam of the “Wissensstadt” Berlin 2021 is a friend and colleague of mine. He is a professor at the Dahlem Center for Machine Learning and Robotics at the FU Berlin. He gave a speech – with the support of his two 9-year-old daughters – about "Abstract and rational thinking, self-reflection, social interaction". In his talk, he enumerated what distinguishes AI from intelligent systems (IA): IA, he said, does only solve specific problems, such as a robot that explores the surface of the moon or a car that indicates how far you can still drive with the current fuel in the tank. His daughters consequently added that in their understanding "Artificial Intelligence is something that can tell jokes, recognise feelings, hold a conversation on its own and not just solve specific problems, in other words, everything that a human being can do". For my colleague, this is proof that even children develop a sense of what constitutes intelligence and what does not.

So, will we become superfluous? I do not know. But what I can do is to tell my impressions today. I would like to raise 4 points :

First, the human's level of education should and must be a central concern. When I gave an evening speech to 25 participants at a private business dinner in Luxembourg some time ago, one of the participants asked me: “Do you use Facebook?” I answered ‘no, I never do’. She was very surprised and asked how I could teach AI?

Many of us talk about Dartmouth College and the birth of modern AI in the 1950s. But we should not forget to think of the ancient Greeks and Thalos, the robot made entirely of bronze, created by Hephaestus to protect the island of Crete from invaders ~~(and: in the end Thalos died because of his love for a woman: Medeia).~~

Whoever talks about AI today mainly talks about the application of machine learning methods and overlooks the fact that the future depends on the past. This is because the training and test data (used) exist and the future models developed are only as good as data history allows them to be. Also, one often hears the statement "the more data, the better". This is not necessarily correct, because the quality of the data should, of course, also be taken into account.

The word AI has .long since become. a symbol for something inexplicable, almost a substitute religion. I often have to listen to sentences like "We are doing AI now, too" or "The AI says it works like this". But isn't it actually still the same engineering technique, just in new clothes?

I accepted in 2018 an invitation to Brussels as part of an EU event. One of the keynote speakers closed her speech with a remarkable sentence. She said, "There are 3 main issues when AI meets society and these are: Education, Education and Education.

I agree with her completely.

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A **second point** is the emergence of a double-edged usefulness aspect. For example, IA in modern vehicles take care of us with precisely computed information, such as calculating our current position and navigating us to our destination by including current traffic jam reports.

At moment, we have the choice to use them – if we know how. and .understand why to turn the systems on and off. The assistant keeps the vehicle in its lane by temporarily taking over the steering, it controls the starting of the car by checking whether the human is fit to drive and presents additional information regarding the vehicle's status with a series of statistical numbers. Self-driving cars are on the horizon and the prospect of actually just having to decide whether to get in or out is not far off.

This, of course, is all very useful! But, after a certain point, we get used to it and do not want to miss it. Usefulness becomes a matter of course and leads to a change in thinking: the acting before is no longer enough.

That is good and bad at the same time. It is good because it is a certain progress. But, too much usefulness is not only useful. The consequences are that on the one hand we rely on it too much and too often and simply risk forgetting about alternatives. The sense of being proactive and making an effort to understand things for oneself gets lost. Here we are again at point 1: Education. I sense more and more consumption.

Example: We follow the instructions of the navigation app on the mobile phone without keeping an eye on the road and thus risk being hit by, say, an electric car that we do not hear.

And, when a yellow light comes on in the car's display, constantly prompting us to have the next inspection within the next X days including blinking, changing colors, and counting the days to 0 and beyond, or when the assistant "recognises" tiredness at the wheel and suggests that we finally should stop and take a break, don't we begin to ask ourselves, who is actually serving whom here?

Fortunately, there is no punishment yet, such as small electric shocks if the recommended exit is not taken, or a higher insurance policy if the maintenance interval is not followed exactly. But social scoring in China tells us that this is not a distant prospect and could well be applied in other parts of the world in a weakened form.

What also scares me is who sets all these parameters, rules and patterns in the name of usability? The IA engineer? Myself, unconsciously, with a profile I am not aware of? Who explains the results?

A nice anecdote: a former colleague here at the University of Luxembourg told me once that at a project meeting with partners from industry, the fully automatic shutters on the windows, equipped with sensors, suddenly enveloped the room in complete darkness and all the participants could no longer even find their way to the light switch. That is crazy!

With all this usefulness and the associated goals and visions, one might get the idea that it is more about functioning digitised systems that we humans have to fit into. I can assure you that the shutters will always darken the room as soon as the sensors report too much brightness. You don't stand a chance in the office! So, maybe, Descartes' philosophical statement should not be "cogito, ergo sum " (I think, therefore I am), but "Utor, ergo sum" (I use, therefore I am).

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Third point: IA, AI and the symbiosis with myself.

Writing poems, painting pictures, optimizing body movements, or composing music, especially through techniques, which are often based on Deep Learning, are stimulating more and more artists and to use these techniques in the scope of creativity.

I think that is a good thing overall, but I hope that such creative developments remain transparent. Eventually, we should not only think of labels such as "Made in Europe" or "Made in China" but also of: "Made by Human" or "Made together with Bob, the artificial composer".

I would like to remember *Harold Cohen*, a former painter and enthusiastic user of Aaron, his machine and student. Harold Cohen made jokes that "he was the first artist who would ever be able to have a posthumous exhibition of new works created entirely after his own death".

I also want to mention *Taryn Southern*, a pop artist, who says: "using AI, I am writing my lyrics and vocal melodies and am using that as a source of inspiration. Because I am able to iterate with the music and because it gives feedback and parameters and because I can edit as many times as I need, it still feels like it is mine." Also, *Holly Herndon*, another pop artist, calls "her laptop as the most intimate instrument".

Most recently, the head of the German Telecom company proudly informed us - through a major German newspaper and various social networks - that *the 10th Symphony* of Ludwig van Beethoven could finally be composed with the help of Deep Learning. Wow! But what bothers me a lot here is the implicit general assertion "the 10th symphony" and not "a version of the 10th symphony". I mean, many of us could do the same: we take Beethoven compositions as underlying data, train our system, and then apply it to our version of the 10th symphony. With our parameters, our model, and our creativity. Then, we already have several 10th symphonies and we could organise a concert: "10 times Beethoven's Tenth".

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Fourth point: Acceptance.

Our home is highly secured, also with cameras and sensors, digitisation here and there with connections to emergency services and the police, and the possibility to switch the reading lamp on and off even when we ourselves are in the Bahamas.

A few years ago, I attended a lecture, in which the speaker reported on an ‘intelligent’ carpet. This carpet was full of sensors and able to recognize/predict a patient's falling over as an emergency and thus call the emergency service and the police.

One vision and demand called for by Eric Topol, Director of Scripps Research and one of the leading minds in AI and Medicine, is to treat patients at home. So, imagine someone falls over, the carpet calls the emergency, and then Bob, the intelligent robot assistant, does the emergency care on the spot! This is absolute madness!

However, at a conference of the German Ethics Council in Berlin in 2019, a colleague from Augsburg spoke about a study on the subject of care for the elderly, involving healthcare robots and inmates of an old people's home. She mentioned that after the end of the trial period, the participants were asked how they felt about this time. There was (at least) one woman who said that she liked the project with her robot very much, but not because of its functionality and care, but because every two days the young female students visited her and came to maintain the system".

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In a survey that I conducted in 2020 with some of my students as well as with some of my colleagues, a total of 116 responded as follows to the question of whether AI (in the sense of IA) was pro or against humanity. Here is the result: 14 of them were very pro, 21 were almost pro, 63 saw AI as a double-edged sword, 13 were slightly against, and 3 were very against. Yes, and 2 of them did not care at all. Even though it was not a representative survey, there is a healthy level of scepticism and balance in terms of different views. That is good.

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No matter what happens. Already today, we can no longer say with certainty whether the voice on the phone is not a machine after all. To pass the ‘good old’ Turing Test is within reach. What is important for me, too, is a transparency of IA and AI. From my point of view, the insight that one should continuously educate oneself further and that one always should try to understand the 'things behind' are essential. That does not always work, but at least we should give a try. In fact, the worst thing is always to remain in the dark.

Of course, incredibly powerful technology is an advance that we (not only as Europeans) should not miss. After all, we want a world that is more sustainable, safer and more ethical.

But new technologies should be there for humans, not the other way around. New technologies should be transparent and, as things change, adaptable. Technology should be tested in the long run and technology should not developed exclusively by engineers.

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Please do not understand me wrong: I believe that IA (and AI) will more come true. I am not afraid of the technology although it is sometimes annoying. I am much more afraid of people with missing knowledge, who uncritically accept a ‘wisdom of the crowd’, disregard the basic ethical and moral principles for the sake of power and economic advantage.

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Let me conclude by returning briefly to the short story: nothing is known about the return of the two astronauts to Earth and it was not even left to the reader's imagination to think about what might happen after their return.

I believe that the return itself to Earth will probably be exemplary, something like this:

with the help of a guiding beam proactively adjusted by Cutie, the space capsule will be steered fully automatically into the Earth's atmosphere. Risks are, of course, minimised in advance and any problems, for example with the heat tiles, are adjusted absolutely safely with the latest materials, diverse optimisations, and some predictive factors.

And the crew will not be alone, because space tourism has long since begun. So the journey might be delayed a little due to space traffic jams. Both can sleep peacefully, a robot mum in a hologram or a QT robot give them security, and only because of a preliminary medical examination - shortly before landing - do both have to raise their left arm and turn their head to the side. Reason: both receive an injection with nano-robots that are designed to deliver the necessary drugs to the right parts of the body to quickly build and regenerate the muscles.

Yes, and of course, all data is sent to the ground station and the crew’s state of mind is constantly monitored. The space capsule finally lands safely, but not in the Nevada desert, but on the roof of the Hilton Hotel in New York. Why? The hotel had the best forecast values for a successful and safe return.

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I look forward to your questions.

Thank you very much!