

# HOLGER MEY

Vice President, Advanced Concepts, Airbus

## Ali ASLAN

Already, you see through the first two statements from Masood and Mari, that there is a bit of a contrast, with Masood striking a more cautious tone, not pessimistic, but cautious, while Mari is saying that we are going to prevail and having a much more optimistic outlook. Let us see where Holger Mey falls into this. Your title is Vice President of Advanced Concepts, which is an ambitious title. With that title and your job at Airbus, we would like to hear where you think AI is heading.

## Holger MEY

Thank you. I am not actually a techie, I am a political scientist and I studied security policy, defence related issues for about 35 years. My role is to consider the future a bit and see what the future security challenges are, because the better we understand them, the better we understand future customer requirements. Doing that, of course, you usually discover old and new things, things that you have seen for centuries or even millennia, and others that are new. I will try to put Artificial Intelligence into a bit of context.

History is always continuity and change, so in a sense many of the future wars and challenges we know pretty well from Roman times. In a sense, we have the Roman Empire plus cyber; things that are old and things that are new. Of course, sometimes new stuff replaces the old and, indeed, we have very little cavalry today, although horses could well be useful in some areas in Afghanistan. However, when we invented long-range weaponry such as bow and arrow, it was superior to clubs, but only as long as the archer did not come within striking distance of the club. In the future, we are going to see laser weapons and cyberwar, but also explosives, guns, etc. Trend extrapolation usually means it is about higher, faster, further, but sometimes there is something new. Henry Ford made this wonderful statement about cars that if he had asked customers what they wanted, they would have said faster horses. Sometimes, we have to explain why we invented the combustion engine, etc, and that things are going to change. The big changes we are going to face are nanotechnology, biotechnology, robotics, and Artificial Intelligence. The really interesting thing that comes up is when these four megatrends merge. We had a chemical and a biological evolution and perhaps one day we will have a mental evolution—and I cannot wait for this to happen. If you watch TV in the afternoon and zap through the channels, you see soap operas and soul striptease shows, and I physically suffer after five minutes because I find it so unbearable. Is this really Homo sapiens? Is this the result of evolution so far? Or, can we move beyond that? Let us see.

We are at the edge of moving into digital production in the economy, 3D printing, i.e. additive manufacturing, etc. That is just the first step and we will move further into the biomolecular or bio-nano production. For instance, we will be able to produce an almost endless amount of meat without animals. If you lose an arm in an accident, it will regrow. It is only a question of time, because it does not violate the laws of physics. We have interesting views, like those of Stephen Hawking who says that Artificial Intelligence is the biggest threat to mankind. While molecular biologists say it is the mutation rate of microorganism, because they undermine our immunisation efforts.

Let us look at computers. As we build and programme them today, computers are instruction-executing machines. We write instructions and they do what they are told to do, wonderfully, beautifully, in a reliable manner, but they do what we tell them, even if we tell them to learn they learn. What exactly is it that they do differently? So far they do things very fast and very reliably. There is a competition in supercomputers every year and China has won three times in a row. Last year, we were at 93 quadrillion operations (FLOPs) per second, which is pretty fast, but it is nothing if we move into quantum computers. What it means in the future and in other words: computing capability will not be the limiting factor. The question is: what is it you want to calculate? It may come as a surprise, but computers actually cannot do maths very well. If I ask any of you what three plus five is, you will immediately say eight. A computer cannot say that because it has to say "if this, than that", "if this, than that", and it does it incredibly fast, but that is what it does.

Computers do many things better than human beings, e.g. they control complex production processes, perform dangerous tasks, and we move on with automatism and, at some time, autonomous systems. At the beginning, they repeat narrowly predefined actions, but they, of course, move beyond that. We have seen a film where these tiny little flying taxis do 'sense and avoid' by themselves. If it comes to combat robots, we maintain the decision to kill or not to kill, but everything else could be done by the machine. If you enter a situation where all the issues at stake are well predefined, it is comparatively easy. If you are a commander of a missile defence unit and the sensors tell you that there is a ballistic missile approaching one of your cities, and you should launch the interceptors, then you better launch the interceptors. You are not going to call for a cabinet meeting, you do it and launch the interceptors. All the situations are pretty clear.

However, how will the computer decide when you are the passenger, not the driver, in an autonomous vehicle and you enter a dangerous situation where you either drive over a kid and survive, or you drive against the wall and the kid is safe, but you die? We have to decide at the moment, but if the decision was left to the computer it would probably say that Mr. Mey you are now 59 years old with three adult kids. The doctor's bills keep going up and we could use your retirement pension fund for other things. Here is a young guy with good genes, good intelligence, facing his whole life, and paying all his future work life into the insurances, should he not be the one to survive? Even if I do not like it, I probably must accept the overall situation, because if we move into autonomous driving, the likelihood of a deadly or life endangering situation is a million times lower than when people drive. Probably statistically I have to accept it, no matter how I feel.

Then, the question is: what is intelligence? We do not know. I think that what we usually call intelligence is the result of an intelligence test. You do a test and we call the result intelligence quotient. Does it do good things to us? We usually think yes, but lots of the people in the Third Reich in Germany were pretty intelligent, but they were also very evil. What exactly do we look at? Is it artificial intelligence or the use of intelligence by artificial organisms or machines? What makes the difference? What actually is "artificial"? Human beings are natural and they do something that is the application of natural laws (the laws of physics), so it is not so artificial. Of course, emotions are another thing. If I give my students what they consider to be a very rational, cold-blooded world view and they ask me about the emotions, I ask them back what emotions? Hate, perfidy, bestiality, etc.? And they say, no we mean love, charity, and care. Therefore, I tell them that they obviously have used their brains to make a rational differentiation to distinguish these emotions from other emotions. Hence, emotions are not *per se* good but can be terribly bad. But what is bad? Whether we consider emotions good or bad depends on a value judgment which is closely related to culture.

Therefore, once we start with automation and autonomous systems we automatically run into liability problems. For example, household robots in Japan taking care of the household or taking care of the elderly. If somebody is injured or even killed by a robot, what do we do? Do we put the robot in prison? Is it the software developer, the producer, the guy who sold the machine, the people who bought it, the person who switched it on? At the end of the day, who is actually liable? We have to discuss this very carefully as we enter this process.

Last remarks. Ray Kurzweil, a famous theorist of artificial intelligence, wrote a nice article 15 or 20 years ago, with the title, 'The computers will convince us that we are superfluous'. If we do not want to be superfluous, we must think about our role in nature. What is it that we can do better than computers? At the end of the day, it is not about humans controlling computers, because who would it be? Do you want Mr Hitler to be in control? Stalin, Mao or Pol Pot? No, we only want good people to be in control, but who is good and who defines it? This always comes back to us, our cultures and value systems, preference, and priorities. We should not just educate our children at universities to become computers, in the sense of memorising everything and repeating it for exams. We should encourage them to think outside the box; to challenge conventional wisdom; to be innovative in all these things. I think that is now at the core of the challenge and we will see that China is likely to programme autonomous systems differently from us, because they value collectivism and individualism differently from us. All these issues are key when it comes to artificial intelligence. Thank you.

#### **Ali ASLAN**

Thank you, Holger, for giving us an historical, if not philosophical approach to the subject of Artificial Intelligence and of course, a much-needed plea not to watch daytime television.



**Masood AHMED**

Is that when your show is on?

**Ali ASLAN**

My show is on in the evening, so I am safe.