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MAGAZINE

Zero-emission? Let us bring factories back to the cities

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It sounds like a paradox, but according to Wolfgang Wahlster, CEO and scientific director of DFKI, it makes no sense to build future zero-emission production centers if the commuting of workers remains highly polluting

We met prof. Wahlster at FBK during the conference entitled “The pleasure of research in AI”, and had a chat with him about the future of **artificial intelligence** and **industry 4.0**. He told us that it is hard for a research organization to compete with big companies in retaining talent, but also that there are great opportunities in the **manufacturing industry** in Europe.

Everyone talks about AI. How do you define it?
I see artificial intelligence as a very important part of computer science. Of course it has many connections with cognitive sciences and there are two approaches: the cognitive approach and the engineering approach. I think FBK and DFKI’s approach is the engineering one, which means we want to build computers that show behaviors that we would call intelligent if seen in human beings.

Based on your experience in artificial intelligence research, what are the factors needed for a successful innovation ecosystem?
One of the most important factors to really have an impact, both socially and industrially, is to have a good ecosystem around the institute, as is the case for FBK. It takes some time, but I think we have to find excellent industrial partners, big companies on the one hand, but also many spin-offs and small and medium-sized companies working on a common goal. An example would be manufacturing, or new types of cars, energy systems and so on. This is a strength that we have in Europe with clusters that see industry and academia work together.

What are the distinctive features of European research and innovation in AI, compared to global markets and trends?

I think the global market is mainly consumer oriented, with large online companies like Amazon, Google and Facebook in the US and Alibaba in Asia. In Europe we are rather weak in this industry. ***Our ecosystem is based more on the production of physical objects****. I think we are very good at using artificial intelligence for the physical products we are producing. In Germany, we have our machines, we have excellent appliances and the best washing machines. We also have* ***excellent means for harvesting*** *as well as excellent medical equipment. Our idea is to bring artificial intelligence into these physical systems, not to push it into consumption oriented internet systems.*

This also happens because we have an important disadvantage in Europe: ***a very fragmented digital market****. On the one hand, we have not only the language barrier, but also different cultures, which is the beauty of Europe, but that at the same time makes it very difficult to launch a product. If you go to China you have millions and millions of people, just think of Beijing with a population of 22 million. In Europe some states, like Finland, have only 7 million people and manufacturers need to adapt to the Finnish language. So we think it's better to stick to physical assets and inject artificial intelligence there, and that's what we're very successfully doing.*

How are relations between public research institutes and global companies changing research in artificial intelligence?

I think that global companies increasingly recognize the importance of AI for the ***innovation*** *of their company, its products, but also for the internal organization of production processes. I do not know any big global company that does not have an AI department. An increasing number of big companies have very interesting positions for researchers in artificial intelligence, so* ***as public institutions, we will struggle to retain our best talent****, because obviously jobs in these industrial laboratories are by far better paid. And the better the research conditions, the more people are willing to move. Every week we receive offers from all over the world and I have a hard time trying to convince researchers to stay with us at DFKI.*

How will industry 4.0 affect our lives in terms of employment rates and job quality?

Industry 4.0 frightens many people, who think they might lose their jobs. But what is happening is quite the opposite: we observe that the countries with the higher number of robots in Europe are those with the lowest unemployment rates. The demonstration is also given by the onshoring trend in the manufacturing sector. ***Many companies that have moved their production to Asia are now coming back***

because Industry 4.0 is going to lead to mass customization.
An example: if you want to configure your Adidas sports shoe on your laptop you do not want to wait 4 weeks before they are shipped from Malaysia; you would like for them to be at your doorstep in one or two days. This means that the place of production must be close to consumers, and that is why factories have to return to Europe. So, unlike general perception, I think that AI will lead to more jobs. As for the workers, I think this system, if well designed, can be a chance for relief, for support to work better. We are not talking about lifeless factories, but factories in which men and robots will work hand in hand.

What can the contribution of artificial intelligence techniques be to address the 17 sustainable development goals set by the UN in 2000 to eradicate poverty, hunger, illiteracy and disease?
A tangible goal is that, through industry 4.0, smart factories become ***zero-emission*** *and can relocate to city centers. For a long time, we have had the big problem that most of the big factories were located outside populated centers. So even if factories are getting increasingly cleaner, there is still a very active commuting between the place of residence and the place of work.*
What we want to do, through artificial intelligence, is to have smart factories that can stay directly in the residential areas, so that people can actually walk or cycle to work, thus ***cutting on CO2 production****. As it makes no sense to have zero CO2 rates and car traffic out of control.*
We are therefore convinced that only with ***artificial intelligence*** *it will be possible to achieve an intelligent management of resources in factories, so that the waste of resources is reduced as much as possible.*

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