

'AI can assist us in image analysis at lightning speed.
I sincerely believe in the power of AI.
It will also only make our profession richer.'

ERIK RANSCHAERT - RADIOLOGIST



'Radiology is the specialty par excellence that has already gone through a complete transition over the years. During my training at the University of Leuven, we were still working with photographic film. The advent of digital imaging a few years later brought about a first major transformation. Years later came PACS (Picture Archiving and Communication System). This marked a major step forward in the way medical images were managed, stored and shared. PACS enabled even better collaboration between doctors. And now we are fully seeing the impact of AI on our profession. By now, we are used to adapting.

The digital transformation of our profession has fascinated me for years. More than that, it quickly became a thread running through my career. In 2000, I founded a teleradiology company that allows images to be viewed remotely and not necessarily in the hospital itself. I was one of the pioneers then. In 2016, I obtained my PhD on that topic from the University of Antwerp. Now I work three days a week as a radiologist at the hospital, but I also teach medical students at the University of Ghent about AI in healthcare. I also conduct scientific research on AI in our sector and advise companies and hospitals on implementing AI in their professional activities.

MORE EFFICIENCY THANKS TO AI

About a decade ago, AI started rearing its head here and there. What is AI? How will AI affect our job? How far can it go? Expectations were huge at the time. A lot of fuss was also made in the media about the impact of AI on our profession as radiologists. Will our profession eventually disappear? Will AI take over from us? There was doubt and fear. Meanwhile, this wind has died down somewhat. We realise that a lot is possible in the radiological field thanks to AI and that this will mainly help us to work more and more efficiently as radiologists.

Indeed, we are seeing an increasing demand for imaging in radiology. Our examinations are also becoming increasingly complex. Our scanners can do more and more. Consequently, we also need to extract more and more information from our images. We feel we are gradually reaching our limit. AI can help us with this

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Take radiography for bone fractures. A patient rushes into the emergency department in the middle of the night. A picture is taken, then the emergency doctor reviews. As an extra back- gen support, AI can also accurately analyse the photo and tell whether it is actually a fracture or not, thanks to algorithms. The patient knows where he or she stands in no time. The radiologist does not even need to be called.

AI can also play a role in screening for breast cancer. When taking a mammogram, a specific procedure has to be followed in our country as well. For example, each mammogram must be viewed by at least two radiologists. In case of doubt, a third radiologist also looks at the image. In our country, all women from the age of 50 are invited for a mammogram every 2 years. That means a lot of extra examinations and a large capacity of radiologists. AI can also help us in this as an assistant. For instance, AI can take over the role of the second radiologist. If there is any doubt, he or she can still look at the results with us. But one radiologist falls away in this scenario anyway. Research showed that accuracy increased by 20% thanks to AI. Consequently, 20% fewer cancers would be missed. Moreover, it is faster and cheaper. Currently, there is plenty of research being done on whether we can also use AI effectively for breast cancer screening. There is still insufficient 'evidence', but the prospects are favourable.

Do such use cases remove doubt? We are on the right track. If you want to build confidence in a particular technology, you need to be able to demonstrate even more that it has real benefits in clinical practice and that fewer mistakes are made than before. We need to start testing and gathering evidence on a large scale. We are in the midst of doing that.

SOME OBSTACLES

Who will pay for all this? Who will invest in the necessary software to enable AI? That too appears to be another problem. Suppose there is clear evidence that, as a doctor, you can examine 20% more patients in a day thanks to AI. Then the hospital may reason that you can generate more revenue at the same time,

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without expanding radiological capacity, which is therefore a positive business case that also makes the investment pay off. But currently, even this evidence is not conclusive. Moreover, the NIHD is not yet making any reimbursement in this area. If you want to invest in AI as a department or hospital, you have to do it yourself. That too slows down the application.

Moreover, the applications today are sometimes too narrow. You can train an algorithm to detect a fracture, but that algorithm will only focus on that. Suppose there were also a bone tumour, that algorithm will not detect it. Consequently, a radiologist will never be able to be replaced. AI does not yet offer the ability to assess the full picture.

CT SCAN WITHOUT CONTRAST MEDIUM

I am currently one of the initiators of Netzeroaict.eu, a particularly interesting project at Oxford University. We are developing algorithms for AI to do CT scans. In such a CT scan, you normally inject contrast medium into the patient to better see the blood vessels and organs and better characterise an abnormality. Now we are training an algorithm that allows us to make this contrast virtually and so we may not need to inject anything at all. A revolutionary and sustainable step in the field of radiology. Because those contrast liquids are polluting and expensive. In some hospitals, patients have to pay extra for them. Moreover, the burden on the patient is much smaller: no more needles, no more strain on the kidneys, no allergic reactions... We received a large budget for this from the European Community, allowing us to work on it for four years. As a radiologist, it is very exciting to work on this.

THE IMPORTANCE OF ACTIVE INVOLVEMENT

I don't see Artificial Intelligence as a threat to our profession, but rather as a help. Because I have a clear view of what AI can and cannot do, I also see the limitations. That immediately takes away the fear of losing our job. It's important that our future radiologists also get this insight during their training. Better to be actively involved than wait and see. Also as far as the hospitals are concerned. Their vision and policy should be adapted to this. Preferably today rather than tomorrow. Currently, we radiologists are in the frontline for this because we are working with digital images. But soon anaesthetists, dermatologists, ophthalmologists and other specialists will also be at the management's door with their demand for AI applications. It is high time that hospital directors focus on this.

Ethical concerns also need to be urgently scrutinised. What about patient privacy? Technically, it is already possible to filter out all patient data from images by encrypting or pseudonymising those images. The information related to the person can be omitted so that that person is not recognised elsewhere. But clear agreements need to be made on that too, based on contracts and agreements. But that too takes time and effort. And what about the bias or so-called prejudice in the data on which algorithms are trained? Are the medical data of all population groups present to train the algorithms? This is another area where hospitals and developers need to adopt appropriate policies. Some hospitals are prepared for this. They have their own team of ethicists and a DPO (Data Privacy Officer). Other hospitals rather take a wait-and-see approach. And that is pernicious. Because the ever-increasing influence of AI is irreversible. So we need to jump on that train in our sector too.



CONVERSION TAKES TIME

Unfortunately, the reaction time in medicine is a bit slower than in the corporate world. We are less flexible because scientific research is often linked to each step. Before we implement something, we have to be able to prove scientifically that it is reliable and really works. Just like with new drugs: before a drug comes on the market, it has to meet the necessary scientific requirements. Consequently, conversion requires more time. But we all need to pull together. Not only from the doctors' perspective, but also together with computer scientists and other experts in the field. We also need to close that gap as soon as possible. We need people who can communicate with both sides, so that we as doctors can make our needs clear to those developing the products. This communication, too, could be better. But it is being worked on. And that creates prospects. I sincerely believe in the power of AI. It will also only make our profession richer.'