How AI enables a more humane healthcare system

Nijmegen tops the international rankings of cities using artificial intelligence to fight breast cancer and other diseases, alongside universities such as Harvard and Stanford. "Research, business, and government come together here in a unique way", says Jaap Kroes, AI team leader at Screenpoint Medical. The Nijmegen-based medtech company specialises in developing technology that allows breast cancer scans to be analysed faster and more efficiently. "The number of mistakes by AI is decreasing. With proper research and the right regulation, we can work on technology that allows us to find breast cancer faster and more often, and hopefully in the future doctors will have the time and space they need for their patients again."

"One of the first real applications of AI in the medical world is in mammograms, the scans we use to detect breast cancer", Kroes says. "That's because there have been all kinds of population studies all over the world for thirty years, so the data has been collected very consistently. In addition, the question with breast cancer is very clear; 'is it breast cancer, yes or no?' With lung cancer, for example, it is more complicated. A lung is closer to all sorts of organs and because of that, there is a higher chance of 'by-catch'. All kinds of things happen in a breast, too, but because there aren't as many diseases that show up there, a tumour is relatively easier to find there."

Needle in a haystack

"Out of the thousands of women who are screened and have a mammogram, fortunately only 3 or 4 actually have breast cancer. But radiologists have to examine them all equally carefully, and it's not easy to spot a tumour on a scan." Finding breast cancer is like looking for a needle in a haystack. Doctors used to do this by sight, but with technology from Screenpoint Medical, they can now have the scans analysed by an AI system. "Our system has already analysed millions of scans, from women of different countries and with different backgrounds. Based on this data, it draws up an opinion or conclusion about the submitted scan. It's up to the physician how to move forward with this output."

Kroes leads Screenpoint Medical's AI team. "I'm looking with the team to improve current products, but we are also exploring interesting directions outside radiology, for example. We recently completed the MARBLE project, where we developed software to compare women's

Unexpected Intersection
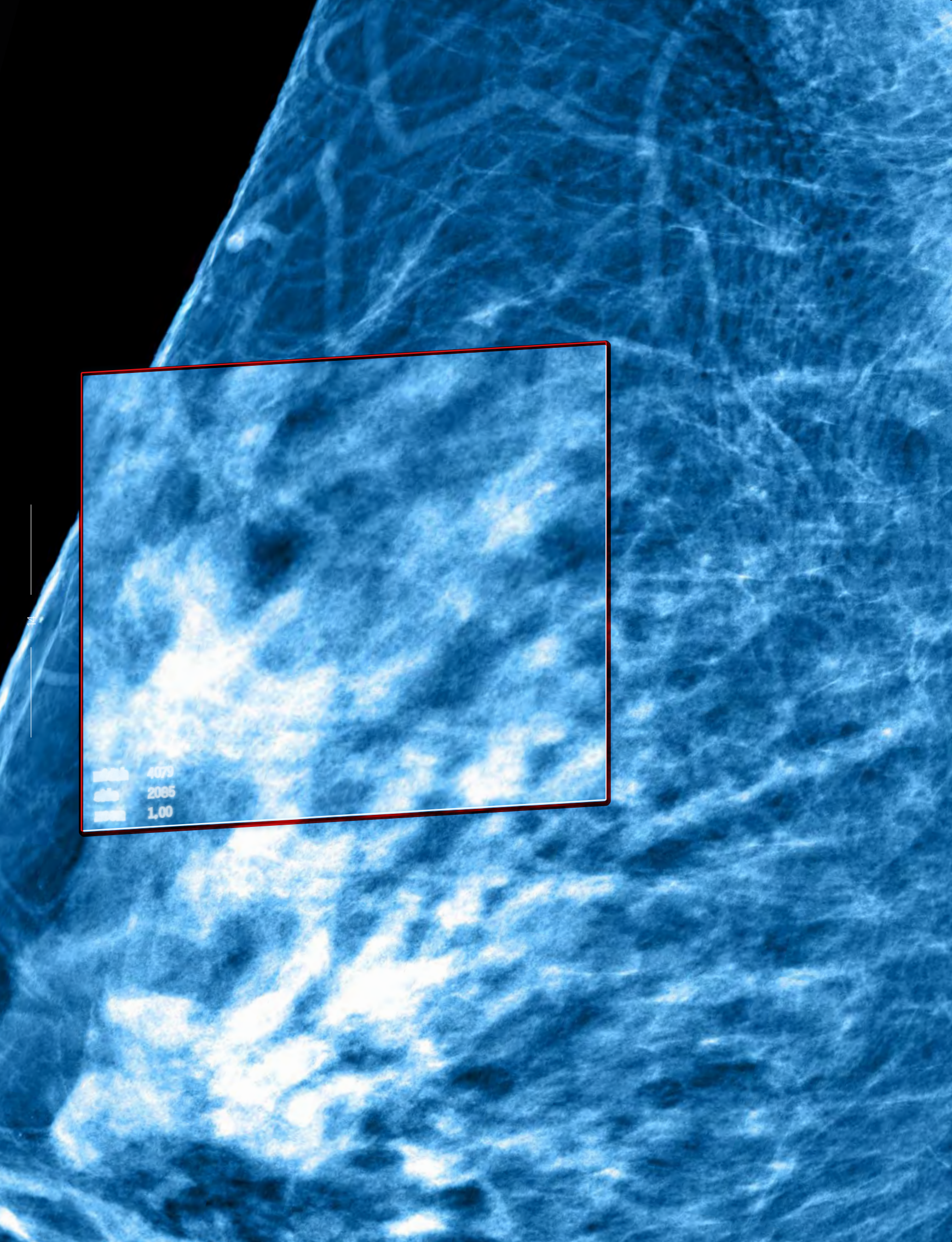
current mammograms with their mammograms from previous scans. A change between the two scans may indicate something is going on. Together with the Radboud University and the Radboudumc, and with the support of EFRO, we have expanded our technology, which will allow us to provide even better support in the future."

FDA-cleared

According to Kroes, Nijmegen is a world leader in the application of AI technology, particularly in healthcare. "The Netherlands is highly advanced in the field of breast cancer research and treatment. We were one of the first countries to establish a nationwide breast cancer screening program in the 1990s. Nijmegen is home to the Radboudumc and the national expertise centre for breast cancer research (LRCB). So you have companies, research, the clinical side - as well as the connection with the population. That's really unique."

Screenpoint Medical is not the only company in Nijmegen working with AI on the early cancer detection. "The floor above us houses Thirona, who specialise in AI technology for lung and eye cancer scans. Together with them, we are one of the few in the Netherlands with FDA approval in this field. This means that we can also introduce our technology in the US. It is really special to find two companies with this certification here in the same building on the Heyendaal campus."

Are we being too strict with AI?

It sometimes seems as though humans are allowed to make one mistake after another, but what about AI? "Twenty years ago, AI was still a funny little thing you would come across once at a trade show somewhere. 5 years ago, it was booming, everyone wanted something to do with it. Now, we are in a phase where it is seen more and more as an application, really as a product. I think this is a positive development, but we still have to remain cautious. If the trust is misplaced or gets out of hand, then there is a greater risk of mistakes. You can see this in ChatGPT, for example, where people copy and paste text without checking it."

Nevertheless, AI generally makes fewer mistakes than humans. "People, including doctors, get distracted, tired, or have things on their minds. As a patient, you can suffer from that. AI is controllable and measurable and it is not guided by prejudice or discrimination - with humans, we are not always sure. Still, we are stricter with AI than we are with humans. Just look at the 'benefits affair' or self-driving cars: when things go wrong, all confidence is lost. Understandably so, because when things go wrong, the consequences are huge. It may not sound very exciting, but that is precisely why good regulation and legislation at this stage are so important."

Staying alert in the AI revolution

"In other countries, the adoption of AI in population research is moving faster than in the Netherlands", notes Kroes. "For example, our products are already being used in Sweden, Denmark, and Spain. One reason for this is that everything is locally or regionally organised. After a successful pilot in the Copenhagen region, we were able to move on to the next region in Denmark. In the Netherlands, the introduction of this type of technology is organised nationally, so it sometimes takes longer, but nevertheless, our country is still playing a leading role in the field."

With the right laws and regulations, Kroes thinks AI can actually help make healthcare more humane. "We should not use everything unchecked, but we should dare to apply of what we know works. From that you can make better decisions and have more personalised healthcare. If we apply AI intelligently, it also creates more space again for interpersonal contact between doctor and patient and more tailored care. And if you can use AI for a second opinion, and possibly save someone's life, wouldn't it almost be unethical not to do so?"

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