Radiologist Interview

Good things only come about together

Interview with Prof. Dr. Elmar Kotter, Senior Physician, IT & QM in the Department of Radiology at the University Hospital Freiburg, and PD Dr. Daniel Pinto dos Santos, Senior Physician at the Institute for Diagnostic and Interventional Radiology at the University Hospital Cologne and at the Institute for Diagnostic and Interventional Radiology at the University Hospital Frankfurt.

To begin with, a basic question: What is your opinion of artificial intelligence (AI) in radiology?

<u>Dr. Daniel Pinto dos Santos:</u> For me, it is impossible to imagine radiology without AI. There will be many use cases in the future where it will become very relevant. AI is here to stay - and rightly so.

What would be predestined use cases?

<u>Prof. Dr. Elmar Kotter:</u> You can distinguish between low complexity, high volume use cases and high complexity, low volume use cases. A typical use case that comes to mind spontaneously is fracture detection. Or in the emergency room as a safety check that no pulmonary artery emboli are missed. Here, AI can be of proven help.

So it's primarily about safety, about a "second opinion." Or do you see AI also in primary diagnosis?

<u>Prof. E. Kotter:</u> I see the latter rather critically. The way we are set up today, the radiologist has to decide in the end. There can certainly be a preliminary diagnosis by AI, which presents its results. But AI is still a long way from being able to make decisions on its own.

Do we want to get there?

Dr. D. Pinto dos Santos: That opens up a very difficult ethical and legal discussion, which I also don't see as a priority at all right now. I see AI solutions as absolutely sensible for safeguarding diagnostics. But I also see another aspect: There are many things that we radiologists don't do today because they are too time-consuming in everyday clinical practice, for example, recording organ sizes or lung changes. I see the greatest potential for AI in these use cases, namely to make information available to us that we would always have liked to have, but which we do not currently have.

Prof. E. Kotter: I fully agree with Daniel. Collecting quantitative data automatically and systematically is an important use case for AI. Aortic diameters, for example, we only measure today if they seem conspicuous or because we are asked to do so. But we don't do that systematically. Measuring bone density or measuring liver density are all applications that would certainly be very helpful.

In order to be able to use the results easily, they have to be integrated into the reporting systems, i.e., into the PACS. Is that also your main requirement?

Prof. E. Kotter: Of course, but that is already reality. Ready-prepared images are sent to the PACS, and the radiologist can look at them there. This data exchange between different applications is standardized via corresponding IHE protocols.

Dr. D. Pinto dos Santos: I am convinced that the integration of the systems will make the difference between an accepted and an unaccepted solution in the future.

Prof. E. Kotter: The ideal is that we will eventually work with report templates and that the AI algorithms will help us fill in these templates. The radiologist fills in the gaps. I can well imagine that different algorithms will work together to detect different things and that, in the end, all the information will be summarized in a more structured report.

What does integration look like with contextflow?

Prof. E. Kotter: In addition to the variant just described, there is also the option of working directly in the contextflow interface. This is a bit more demanding but makes sense, for example, for decision support - especially with the connection to STATdx. A third scenario is the quality case application: Here, the software compares the results it has obtained from the images with the radiologist's findings and looks to see if there are any mismatches. If there are, the software sends an email to the radiologist with a corresponding note.

You both worked on the new version of contextflow's software. What was that process like?

Dr. D. Pinto dos Santos: I received screenshots or mock-ups with very specific questions: How do you see this feature? What representation would you like to see so that the software is intuitive to understand and use? That was a fruitful exchange that I really enjoyed. I think this involvement in development processes is enormously important because you have to understand each other in order to create a good tool that is helpful in everyday life.

Prof. E. Kotter: I would also like to praise the contextflow team. I experienced the exchange as a good, constructive discussion. Especially my feedback, when I tested the system, I perceived it as very welcome. It is not the case with all companies that criticism really falls on fertile ground. But this is the only way to move a solution forward.

What is your experience with contextflow solutions?

Dr. D. Pinto dos Santos: I think they can do some things very well, for example quantifying change, that's a real plus. Personally, I think it's very efficient in that it's less about prescribing a diagnosis and more about helping to find image patterns. That enables the radiologist to make a better diagnosis.

Prof. E. Kotter: I'd like to pick up on that because I really see contextflow as unique in that point. I don't know of any other solution that offers me comparable cases and thus supports me in my decision making. The solution also very elegantly circumvents the frequently cited problem of AI as a black box, i.e. the lack of transparency in decision making.

Professor Kotter, Doctor Pinto dos Santos, thank you very much for taking us a little way into the co-development process of contextflow.