When will AI make your diagnosis?

When used correctly, artificial intelligence (AI) already sees more than humans do: one model, for example, detects signs of liver disease or diabetes in electrocardiograms – diseases that at first glance have nothing to do with the heart. This is possible because AI recognises patterns across thousands of data sets that remain hidden to the human eye.

Researchers are now looking into what happens when multimodal AI models combine different data sources, such as ECGs, blood values and X-ray images. The hope is that this broader perspective will make it possible to detect new disease patterns and facilitate predictions. This is also the aim of the highly contentious "foundation models" that form the backbone of generative AI. These are designed not only to perform a specific task – such as detecting a particular disease – but also to respond flexibly to questions posed by physicians. Yet they are still a long way off. Strict regulatory requirements are holding things back for one thing, and transferring research findings into clinical practice is fraught with difficulties: just because AI delivers good results based on curated research data sets does not necessarily mean it will do the same when dealing with real-world patient data. The danger is that it will make incorrect diagnoses. Systems therefore need to be very robust – and standards for measuring this are still very much in their infancy.

That said, initial applications have been in use for years and are running in the background. AI programmes are already detecting abnormalities in X-ray and MRI images as reliably as specialists – without ever getting tired or needing breaks. For patients, however, visiting the doctor remains a familiar experience: the diagnosis is still made by a fellow human being.

Prof. Dr Nils Strodthoff

AI4Health Division