
This intelligent CT equals less time in front of the screen, more time with patients



Centre Cardiologique du Nord in France uses a new deep learning algorithm to reconstruct cardiac images.

The digital revolution has changed every aspect of our lives – from the way we communicate to the way we live and interact. We are slowly moving towards this transformation in healthcare, where big data, predictive analytics and artificial intelligence (AI) can do for healthcare what it has done for other industries – personalize recommendations, prioritize searches, tag pictures, and more.

“AI will have an astonishing impact in healthcare, and imaging will be the laying foundation,” says Dr. Laurent Macron, radiologist at Centre Cardiologique du Nord (CCN), a well-established private clinic specialized in heart and vascular diseases in Saint-Denis, France.

A cardiologist by training, Dr. Macron has already seen the benefits of the development of algorithms in cardiac imaging. “Scanning patients with rapid heart rate or arrhythmia has always been a challenge for us. In some cases, patients with arrhythmia couldn’t undergo a cardiac CT at all,” he explains.

Since the heart is in constant motion, acquiring a scan that isn’t blurred can be difficult. Especially in patients with high heart rates. In most cases, patients would instead have to undergo a coronary angiography – an invasive, delicate procedure that involves threading a catheter through the heart’s blood vessel.

But advances in software and reconstruction techniques are making equipment smarter, helping to overcome the challenges associated with cardiac CT scans.



"In the last 10 years, we've seen CT becoming more intelligent, including the development of software to help in the choice of protocols, to correct artifact movements on coronary arteries or to reduce metal artifacts. It's helped improve the quality of the raw data acquired by the CT scanner, but also further improved the quality of the data being analyzed post-acquisition".

Last summer, Dr. Macron became the first European user of GE Healthcare's Revolution Apex, a new CT with a deep learning reconstruction algorithm to rebuild images. Powered by Edison – a next generation intelligence platform that helps accelerate the development and adoption of AI technology – Revolution Apex has intelligent algorithms that deliver whole organ coverage, and breakthrough image quality, even for patients with high heart rates, high body mass index, compromised renal function and much more.

"The initial results are extremely encouraging, with an advance in image quality, and probably in diagnosis – this is what we are currently evaluating," says Dr. Macron.

"Most patients with suspected cardiac problems can now benefit from cardiac CT exams. In the last few years, we've seen tremendous improvements in the detection of coronary stenosis and in evaluating its severity, with a clear impact on patient care."

The improvements in the technology, with the wide coverage detector, combined with the performance of the X-ray tube and the speed of tube rotation now enables radiologists to acquire a full heart volume in just one heartbeat.

"It's an exciting time. We really feel that we are at a pivotal moment," says Dr. Macron. "The benefits in terms of productivity are clear, with less time spent on post-processing and reconstruction. In terms of clinical benefits, these new algorithms can help identify lesions that we wouldn't have seen otherwise. It's even more important in places where radiologists are not highly specialized".

This will for sure change the role of the radiologist – affording doctors more time to spend with their patients, addressing their increasing workload and potentially detecting disease earlier.

"Radiologists are first and foremost doctors. Our role is to choose the right exam, explain it to the patient, considering his emotional and social context," said Dr. Macron. "With the huge number of images that we need to read, we spend a lot of time behind a screen and not enough time with our patients".

But it will not be an easy road as there are still many challenges that need to be addressed. "Of course, there is an ideological challenge of being replaced or augmented by a machine. There are challenges in terms of technology readiness, business models, value of data and acceptance of these technologies," added Dr. Macron. "But I am certain that AI will transform the role of the radiologist, and for the best."

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Published on : Fri, 8 Mar 2019