



**GE HEALTHCARE
SPECIAL SUPPLEMENT**

Cover Story:

The Future is Digital

102 **Prof. Boris Brkljačić:** ECR 2020: Leadership and Collaboration

107 **John Nosta:** The Convergence of Technology and Health

112 **Prof. Daniel Drucker:** Advancing the Understanding and Treatment of Type 2 Diabetes

126 **COVID-19:** What Can Healthcare Learn?

162 **Leontios Hadjileontiadis:** Novel Interventions for Early Parkinson Detection

171 **Paul Timmers:** Hotspot: AI and Ethics in Health Innovation

182 **Wilfried & Maximilian von Eiff:** Digitalisation in Healthcare

188 **Peter Dierickx:** The Inner Workings of a 'Smart' Hospital



Leveraging the Power of AI on Smart Devices



The results of the MIT Technology Review survey, in partnership with GE Healthcare, emphasize AI's potential and ensure that the technology is here to stay, but its ability to overcome potential disruption must be addressed.

GE Healthcare believes the solution is in packaging. By unlocking data, breaking it out of silos, and deploying it on the right platform, AI can seamlessly integrate into existing workflow, thereby making it easier for providers to adopt these algorithms.

To do this, GE Healthcare recently introduced the Edison Developer Program to help healthcare providers gain easier access to market-ready AI algorithms and applications by directly integrating these technologies into existing workflows.

“Edison works to meet clinicians where they are and provide the intelligent solutions they need, when they need them,” explains Karley Yoder, Vice President, Artificial Intelligence, at GE Healthcare. “It combines diverse data sets from across modalities, vendors, healthcare networks and life sciences settings to enable quick development of advanced intelligent applications and reduce barriers for developers to create intelligent solutions.”

These solutions can be deployed on medical devices, via the cloud or on the edge, a computing technology that sits close to the physical device.

“The platform selected for the deployment of each application is a strategic one, since each offering provides

unique benefits to radiologists and technologists,” continues Yoder. “That said, many of our product launches this year are on-device AI solutions, which offer unique opportunities to increase clinical and workflow efficiency at the point of care.”

“It also offers a lower barrier to entry for hospital systems that are interested in adopting and testing AI but are hesitant to make additional IT investments,” adds Katelyn Nye, General Manager, Mobile Radiography and Artificial Intelligence, GE Healthcare. “On-device AI does not require infrastructure investments, security assessments, or IT configurations – offering a faster and more accessible way for hospital systems to test algorithms quickly and benefit from several unique on-device AI benefits.”

After consulting customers throughout the world and evaluating their healthcare needs, GE Healthcare announced several unique on-device solutions across its portfolio, each offering a different benefit to customers:

On-device AI can improve efficiency by automating steps in the workflow and expediting exams

“Automation and smart technologies are not only the future of medical imaging but are essential as departments look to transform workflows and the patient experience,” said Dr. Vincent Lombard, the first clinical adopter of Revolution™ Maxima with AI-based Auto Positioning, and a radiologist at Centre Imagery Jacques Callot. “By integrating artificial intelligence into existing workflows we’ve been able to not only improve scan quality and reduce steps, but we’ve also been able to spend more time caring for patients.”

Revolution™ Maxima with AI-Based Auto Positioning uses real-time depth sensing technology to generate a 3D model of a patient's body to pinpoint the center of the scan range and automatically align it to the isocenter of the bore. Altogether, it is designed to simplify, streamline and automate the entire CT experience for one click, hands-free patient positioning.

Automatic quality checks catch errors at point of care, enabling technologists to retake images and fix protocol labels before uploading the exam results to PACs

"Automatically running quality AI algorithms – like Intelligent Field of View and Intelligent Protocol Check – on-device increases efficiency and integrates them into the technologist's standard workflow, enabling technologist actions – such as rejections or reprocessing – to occur at the patient's bedside and before the images are sent to PACS," explains Katelyn Nye, General Manager, Mobile Radiography and Artificial Intelligence, at GE Healthcare.

Intelligent Field of View and Intelligent Protocol Check help detect acquisition errors on GE Healthcare's Optima™ XR240amx mobile x-ray system, flagging images on-device for technologist review and allowing them to make corrections before the images are sent to the radiologist.

Embedding AI into the image processing chain enables the use of raw data to help improve image quality and presentation consistency

"I do not have to choose between improving the quality of the exam and shortening the exam time," says Dr. Pascal Roux, a radiologist at Centre Cardiologique du Nord (CCN), one of the first global clinical sites to evaluate a prototype version of AIR™ Recon DL. "I can have the best of both worlds. [We] can demonstrate high-resolution images with no truncation artifact, imperceptible noise and depiction of sharp structure."

AIR™ Recon DL*, an Edison application providing True-Fidelity™, is a GE-first, deep-learning MRI reconstruction technology application designed to simplify this choice by improving signal-to-noise and image sharpness and enable shorter scan times. Clinicians and technologists would no longer have to compromise between image quality and scan time with AIR™ Recon DL. This application was developed using a neural network trained on tens of thousands of images using GE's Edison AI Platform.

Embedding AI onto the device can help provide clinical information at the point of care and to the radiologist to assist with diagnosis and enable triage

"This project validates the focus of the industry in pushing research & development in deep learning algorithms," claims Dr. Bharat Aggarwal, Director of Radiology and Principal Investigator at MAX Hospital, one of the first global clinical sites to evaluate Critical Care Suite™. "We clearly saw advantages of the system in the sensitivity of detecting small pneumothorax in some patients, enhancing the speed of alerting the treating teams regarding development of PTX in their patients."

Critical Care Suite™ is an industry-first collection of AI algorithms embedded on the company's Optima™ XR240amx mobile x-ray device for triage. Recently cleared by the FDA, the embedded AI automatically analyzes images on-device and immediately flags cases with suspected pneumothoraxes to ensure a fast and reliable way of delivering AI results that are generated within seconds of image acquisition. All this is done without any dependency on connectivity or transfer speeds to produce the AI results, which are sent to the radiologist while the device simultaneously shares the original diagnostic image, ensuring no additional processing delay.

To further assist technologists and radiologists, three additional features are also available in Europe, including:

- **AI Score**** from 0 to 100 is presented in which the higher the score, the more confident the algorithm is that a pneumothorax is detected;
- **Image Overlay**** can be seen on-device (as well as on the Secondary Capture image sent to PACS) and accurately localized 96% of positive pneumothorax findings; and
- **Customization of preferences**** allows users to set an AI operating point (5 setting options) in order to tune the performance of the system to preferred sensitivity or specificity.

"At the end of the day, we believe widespread AI adoption will be determined by its integration into existing workflows and accessibility to hospital systems," concludes Yoder. "All our Edison platforms – on-device, cloud and edge – are designed to deploy the latest AI solutions to healthcare professionals where they need them most." ■

*Not available in the United States and Europe.
**Not available in the United States.

REFERENCES

For more information on Edison, visit gehealthcare.com.

1. MIT Technology Review in partnership with GE Healthcare, "The AI Effect: How Artificial Intelligence is Making Health Care More Human." <https://www.technologyreview.com/hub/ai-effect/>

2. 510(k) pending at FDA. Not available for sale in the United States.

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