Customer story
Macquarie University

FUJITSU

AI addresses challenges in aneurysm analysis

Macquarie University joined forces with its neighbour Fujitsu and medical device manufacturer GE Healthcare to develop an AI-enabled diagnostic technology that can analyse CT scans for brain aneurysms. This technology aims to significantly accelerate the process of analysing CT scans, in order to free up valuable radiologist time. Through the use of this AI technology and the accompanying 3D structural analysis data, neurosurgeons will hopefully be able to make better decisions when planning surgery.

About the collaborator

Established in 1964, Macquarie University began as a bold experiment in higher education and a break from traditions, aiming to be distinctive, progressive and transformational. Today, its pioneering history continues to be a source of inspiration as it leads the way in ground-breaking discoveries. Its academics are at the forefront of innovation and, as accomplished researchers, are embracing the opportunity to tackle the big issues of our time.

Industry: Education | Location: Australia | People: 4,000+ employees | Web: mq.edu.au

Challenge

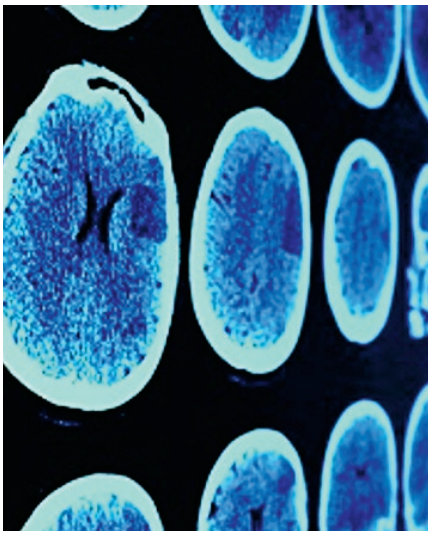
Enable faster, more accurate analysis of CT scans to make the treatment of brain aneurysms more successful.

Solution

- Fujitsu is designing an AI algorithm in collaboration with radiologists to detect brain aneurysms

"This project is a true collaborative effort, but Fujitsu is going out of its way to ensure this will be an exceptional success that will benefit all the partners and, most importantly, patients."

Dr. Brenton Hamdorf, Director, Academic and Research Partnerships, Macquarie University



3.2%

Brain aneurysms present in the global populace

Breaking new ground in medical analysis

When a new professional staff member, Brenton Hamdorf, joined Macquarie University three years ago, he spoke to Fujitsu to see whether there was any scope for collaboration around the areas of lung biopsies and brain cancer scans. Following more discussions with resident radiologists, it became clear that detecting brain aneurysms would be the most rewarding objective.

Brain aneurysms are present in 3.2% of the global populace and kill 500,000 people worldwide every year. It takes a radiologist up to 15 minutes to visually analyse the 512-slice images for each patient, noting blemishes as small as one millimetre across with error rates of up to 16%. Brenton Hamdorf and Fujitsu recognised this as an ideal subject for AI analysis. The next step was to bring a medical device manufacturer on board: GE Healthcare and its Revolution CT scanner.

"We wanted to explore the potential of AI in medicine. Brain aneurysms are a natural fit because there is a real need and a real benefit, and failure to accurately detect an aneurysm can have catastrophic consequences for an individual and their families," explains Hamdorf. "We hoped that combining Fujitsu AI technology with GE's CT scanner, and applying Macquarie University's academic research and medical expertise would provide faster and accurate results."

End-to-end AI-enabled diagnostics

The university is also home to the first Fujitsu Digital Transformation Center embedded within Macquarie University – a dedicated co-creation facility to jointly explore and solve business problems. With a working relationship in place, Hamdorf assembled a team of experts including Fujitsu's Japanese AI specialists and local project managers, radiologists, neurosurgeons and biomechanical engineers.

First, the images, dimensions and key features of anonymised patient scans are annotated. Second, with the data annotated, AI experts of Fujitsu are developing the algorithm and training it to detect aneurysms. Then, the algorithm, will be integrated to GE's own on-board software. The AI is planned to be packaged as diagnostic support software. It will be able to alert areas of interest to radiologists, track aneurysm growth over time, and use fluid dynamic modelling to predict the risk of aneurysm rupture.

"Fujitsu's excellent project management is keeping everyone on track and pulling in the right direction," continues Hamdorf. "Together we will create a true end-to-end solution which covers three key elements: detection, risk of rupture and longitudinal mapping."

Faster and accurate analysis

The new AI-enabled diagnostic technology could dramatically reduce the time taken to review each scan which currently takes 15 minutes. This would bring significant cost savings and thus has the potential to save lives by detecting aneurysms that might otherwise be missed by the human eye. By speeding up the analysis, it would free up valuable radiologist time to focus on other patients.

Through the use of this AI technology and the accompanying 3D structural analysis data, neurosurgeons will hopefully be able to make better decisions when planning surgery.

"Fujitsu is running the project, managing the federal grant received from the Australian Government, (as part of the Cooperative Research Centre Project program), and providing the underlying AI technology," concludes Hamdorf. "This project is a true collaborative effort, but Fujitsu is going out of its way to ensure this will be an exceptional success that will benefit all the partners and most importantly patients."

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