Singapore researchers invent new AI tools to speed up diagnosis

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Singapore-A new tool has been invented by Singapore researchers that may lead to early diagnosis of heart disease.
abnormalities in the heart.

The Singapore Heart Foundation figures show that nearly one of the three people in Singapore in 2019 was due to heart disease or stroke.

Deaths from cardiovascular disease in Singapore also increased from 2017 to 2019. Early detection can also prevent complications such as kidney disease.

Invented by a team from Nanyang Technological University (NTU), Ngee Ann Poly and National Heart Center of Singapore (NHCS), this new diagnostic tool is an AI learning algorithm that allows computers to learn from past experiences like human beings.

Using the algorithm, researchers trained tools to recognize patient ECG patterns based on examples of ECG signals that reflect cardiovascular disease.

In a pilot study, researchers used this tool to analyze ECG signals from 92 healthy and 7 patients with coronary artery disease; 148 had a heart attack and 15 had congestive heart failure. The data was taken from four public databases.

The team found that AI tools could identify ECG signals associated with healthy patients with three different cardiovascular diseases with an accuracy of over 98.5%.

The study was published in a peer-reviewed scientific journal in Computers in Biology and Medicine in May.

“Although additional tests are needed to identify a particular disease, our diagnostic tools allow doctors to triage patients more efficiently and streamline the number and type of downstream confirmatory tests,” he said. Clinical Associate Professor Tan Ru San, Consultant in Cardiology, said at NHCS, co-author of the study.

Associate Professor Eddie N in Quie of the Faculty of Mechanical and Aerospace Engineering at Nanyang Technological University, who co-led the research, said diagnostic tools advances in the fusion of AI and medical solutions.

This tool is still in the preliminary stages of research and needs to be validated with more data.
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The team plans to begin further trials using a large database from local hospitals to validate its clinical use.
Associate Professor Tan Ru San is the co-author of this study. Photo: NTU Singapore

Professor Tan said: “It’s very exciting, but it also requires tampering with our enthralling reality ... this is just the beginning.”

“Technology can be improved at any time and there may be some great tricks the technology can actually do, but I think this is a really promising start,” he added.

Dr. Daniel Yeo, a cardiologist at Apex Heart Clinic at Gleneagles Hospital, welcomed the development, and new AI tools help doctors, nurses, and other healthcare professionals identify anomalous ECGs for a more reliable assessment. He stated:

“The number of cardiologists is small and we cannot read every electrocardiogram. So this AI tool is useful in common practice environments such as large and busy practices. The tool is not too expensive.”

Dr. Paul Ong, a cardiologist at Heart Specialist International at the Mount Elizabeth Specialist Center, said AI tools help unskilled people quickly identify patients with potential cardiac emergencies in ambulances and emergency departments. He said it would be useful for AI to make diagnoses and miss the patient’s medical history and test results.

The researchers hope that this tool can complement current heart disease diagnosis techniques such as magnetic resonance imaging.

He also states that this tool can be extended to detect other heart conditions such as fibrillation, which is a form of irregular rhythm of the human heart.

The tool can also be used on wearable devices such as smart watches to monitor your heart condition in the future.