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Singapore uses AI to create safety system for patients, helps predict falls

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Trials in local healthcare institutions called promising



Applying artificial intelligence (AI) technology to one of the main concerns in patient safety, Singapore-based Nanyang Polytechnic (NYP) and medical technologies firm Longway AI Technologies have developed a system that can analyse human gaits and make recommendations for healthcare professionals to render assistance before a fall happens.

In Singapore, data indicates that one-third of people aged 65 and above have suffered a fall at least once, with 40 per cent of these falls accounting for injury-related deaths. 30 per cent of these individuals will experience recurring falls. Older individuals are more likely to have a fall due to physical or medical reasons, and gait change is a critical early sign of a potential fall.

During the development stage, the AI system was trained with over 200 hours of videos across two phases.

This was done through tapping on 3D convolutional neural network (3DCNN) – an AI method that teaches the computer to process data in a way modelled by the human brain and nervous system. Through deep learning, a machine learning process that uses interconnected nodes or neurons in a layered structure that resembles the human brain, the AI system was programmed to react based on the movement of different joints from a human skeleton post model. And when the system detects specific movements with higher probabilities of leading to a fall, it sends the relevant signals to the healthcare team nearby.

Currently, an enhanced system has been deployed and trialled at the SASCO Senior Citizens' Home at West Coast. NYP is also in discussions with St. Andrew's Nursing Home (Queenstown), to deploy the system within their premises and explore how it can aid in other areas of their residential care.

NYP is also exploring collaborations with the geriatrics departments of several hospitals, aiming to broaden the impact of this technology in the healthcare sector.