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HEALTHCARE

## Researchers develop robot to prevent falls in elderly users



By **URSULA DALE** — September 8, 2022

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Researchers at Nanyang Technological University, Singapore (NTU Singapore) and Tan Tock Seng Hospital (TTSH) have developed a wearable assistive robot that is designed to detect and prevent falls in elderly people.

It is called the Mobile Robotic Balance Assistant or MRBA (which is pronounced 'Mister Bah') and was designed to support Singapore's ageing population.

The device uses inbuilt sensors in conjunction with a safety harness to detect a loss of balance and catch the users.

According to the team, it could also help users who have difficulty walking and balancing to stand up safely from a seated position and return to a seated position.

A depth-sensing camera monitors a person's movements, which are analysed by a machine learning algorithm to estimate the users' state of balance and to better predict future incidents.

The team explain that the human balance control system degenerates with age, an issue that is compounded by conditions such as neurological diseases and injuries, musculoskeletal problems, missing limbs or vertigo.

The bot is intended for use with minimal caregiver help in both institutional and home settings and can assist people with reduced mobility in daily activities that may have previously been difficult.

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standing and walking, as well as other tasks like fetching water. No falls were recorded in the trials, which spanned three days per participant.

Karen Chua, adjunct associate professor at NTU's Lee Kong Chian School of Medicine and one of the co-leads of the MRBA's development, said: "One of TTSH's key strategies is to empower patients with greater access to innovative robotic rehabilitation.

"We want to make robotics therapies more sustainable and accessible in the community where our patients can lead healthier and happier lives."

The robot comes in three models, which cater to weights up to 80kg (176lbs), 120kg (264lbs) and more dexterous movements, respectively.

In addition to assisting users in daily living, the robot can also support key rehabilitation exercises, such as side stepping, balancing on a rocker board and standing on one leg.

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