Researchers develop technology to support stroke patients

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The University of Southampton, in collaboration with Roke Manor Research Ltd, has pioneered the use of Xbox computer technology to develop the world's first process that measures hand joint movement to help stroke patients recover manual agility at home.

The Xbox Kinect works by monitoring whole limb movements allowing controller-free gaming; the gamer becomes the game. However, the University team has taken it a step further to create an algorithm that tracks and measures hand joint angles and the fine dexterity of individual finger movements. The ultimate aim is to capture the data while the patients follow exercises on a TV screen.

The project aims to help people recovering from a stroke to do more regular and precise exercises so that they recover faster. The data collected will be fed back to the therapists caring for the patient so they can continually monitor progress, reducing the need for frequent hospital visits.

This new system has been developed to complement the home-based physiotherapy care already offered to patients in the UK, and follows a recent Stroke Association report which stated that stroke survivors are being denied the chance to make their best recovery because of a lack of post-hospital care.

Health Sciences academic Dr Cheryl Metcalf, at the University of Southampton, has been supervising the project. She comments:

"Recovering from a stroke can be a daunting and distressing time for patients and their families. Through our research we know that many people recovering from a stroke find their at-home exercises repetitive and often demotivating. If they are already finding it difficult and frustrating to move their hands, they need something to encourage them to try harder. We wanted to create a more engaging way to help them recover faster. Using the Kinect we have been able to take a commercially available product and develop a highly novel tool that aims to be both cost effective and clinically applicable."

The Southampton and Roke team's next objective is to create a series of computer games to make the rehabilitation process more interesting for the patient. The games will adapt to each individual's ability and help motivate them to reach rehabilitation goals by feeding back higher scores if their joint movements improve.

Simon Wickes, Healthcare Business Sector Manager at Roke, says: "Strokes are the largest single cause of severe disability in the UK and it is estimated that every year half of the 100,000 stroke patients experience upper limb problems. This project could make a significant difference to the wellbeing of those affected.

Provided by University of Southampton