Researchers at the University of East Anglia are pioneering virtual reality (VR) rehabilitation for stroke survivors, using low cost videogame technology.

They have worked with industry collaborator Evolv to create a new gaming platform to improve the lives of stroke patients suffering from complex neurological syndromes caused by their stroke.

The new technology, which has been funded by the National Institute for Health Research (NIHR), will be unveiled at RehabWeek in Toronto today.

There are 1.2 million stroke survivors in the UK and around 30-50 per cent of them suffer a debilitating disorder called ‘hemispatial neglect’. The condition leaves people unaware of things located on one side of their body and greatly reduces their ability to live independently.

Lead researcher Dr Stephanie Rossit, from UEA’s school of Psychology, said: “A stroke can damage the brain, so that it no longer receives information about the space around one side of the world. If this happens, people may not be aware of anything on one side, usually the same side they also lost their movement. This is called hemispatial neglect.

“These people tend to have very poor recovery and are left with long-term disability. Patients with this condition tell us that it is terrifying. They bump into things, they’re scared to use a wheelchair, so it really is very severe and life-changing.”

Current rehabilitation treatments involve different types of visual and physical coordination tasks (visuomotor) and cognitive exercises – many of which are ‘paper and pen’ based.

The new non-immersive VR technology being showcased updates these paper and pen tasks for the digital age - using videogame technology instead.

Dr Rossit said: "We know that adherence is key to recovery - so we wanted to create something that makes it fun to stick to a rehabilitation task."

In one such game, the patient sees a random series of apples, some complete and some with a piece bitten off. The apples vibrate and move to provide greater stimulation to the patient.

David Fried, CEO of Evolv, said: "The aim for the patient is to choose the maximum number of complete apples that they see in the quickest time possible.

"A person with visual neglect would quite often only see a small number of correct targets to the right-hand side of the screen. Therapists can control the complexity of the game by increasing or reducing the number of apples on screen."

As well as aiding diagnosis, the new game aims to improve rehabilitation by including elements such as scoring and rewards to engage the patient and improve adherence to their treatment.

Fried said: "Traditional rehabilitation treatment is quite monotonous and boring, so this gamification aspect is really important to help people stick with their treatment.

"This product is a direct consequence of us working with researchers like Dr Rossit who made us more aware of the need to provide a better form of therapy to people suffering from this debilitating syndrome.

"Our goal is to use technology to make rehabilitation fun and engaging and we have applied this to our Spatial Neglect therapy solution. The great thing about it is that it can be used not only in clinics but also in patients' homes, thereby giving them access to personalised rehabilitation without leaving their living room."

The team has previously worked with stroke survivors, carers and clinicians to assess the feasibility, usability and acceptability of new gaming technology.

Dr Rossit said: “This technology has the potential to improve both independence and quality of life of stroke survivors. We also anticipate other benefits such as improved cost-effectiveness of stroke rehabilitation for the NHS.

“This innovative therapy could also improve long-term care after stroke by providing a low-cost enjoyable therapy that can be self-administered anywhere and anytime, without the need for a therapist to be present on every occasion.”

The new technology has been funded by the NIHR, the Stroke Association and other UK medical charities. It will be showcased at RehabWeek in Toronto from June 24-28, 2018.