

# Using virtual reality to recover from a cerebro-vascular accident

May 19 2011, By Cécilia Carron

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It's possible to regain mobility in your arms using “Nano” after a cerebro-vascular accident (CVA). Developed by MindMaze, an EPFL spin-off company, this device can be used every day at home.

Portable, accessible and easy to use, the “Nano” represents a small revolution in neuromuscular rehabilitation after a cerebro-vascular accident. This therapy, using equipment that fits into a small briefcase, works using [virtual reality](#). It consists of a screen, a webcam, a pair of dark glasses, a helmet fitted with electrodes, and a glove: the patient puts on the equipment, presses “ON” and the session starts. This ease of use makes it suitable for daily practice at home. “The first few weeks are known to be the most important for recovery. This is when many people give up”, emphasizes Tej Tadi, founder of MindMaze, the start-up based at The Garage – EPFL’s breeding-ground for new companies – which is

developing the "Nano".

## **Making progress using an avatar**

The physiotherapy is based on a simple principle: observing the scene that is supposed to represent us is enough, gradually, to reactivate the damaged region of the brain. When the patient moves his active hand, he actually sees the 3D avatar of his disabled limb moving through his glasses. This activates a region of the cortex adjacent to the damaged area, which then slowly takes over.

The exercises are then carried out with the disabled limb: stretching the arm, picking up an object, or pointing at something.

## **Doctors can access real-time data**

The electrodes fitted to the helmet provide constant data on the brain's activity. Transmitted via the internet with a 3D-image of the brain, these enable the medical staff to see the changes in the patient's brain directly, while remaining at the hospital, and to give him instructions. The patient can follow his progress through the display of this data in the form of a graphic.

The system is due to be marketed by the end of this year. It's currently in the preclinical trials stage at the Vaud canton's university hospital (CHUV). For now it would seem that mobility is also being recovered more rapidly than with the programs currently on offer.

Every year 10,000 people in Switzerland and 12 million worldwide are affected by a CVA. "We began by suggesting a device designed to rehabilitate the arm, because this is the main handicap for 75% of patients who have undergone a CVA", emphasizes Tej Tadi, who developed this technology during his doctoral work at the EPFL

Laboratory of Cognitive Neuroscience.

An EPFL spin-off company, the MindMaze start-up has already won several awards, including the Venture Leaders in 2010 and PERL (Prix Entreprendre Région Lausanne), the prize awarded by the Association of communes of the Lausanne region, in March last year. The company's founder plans to put the first device on sale in mid- 2012. The Swiss and German markets, where the company will begin operations, are valued at 55 million francs. An international launch is planned for three years from now.

Provided by Ecole Polytechnique Federale de Lausanne

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