

# The smart shoe

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Researchers from University of Twente's MIRA research institute, The Netherlands, have developed a shoe that can show exactly how a person walks. The shoe contains a range of sensors which measure the foot's movements and the forces exerted on the ground. The shoe has primarily been developed to help the rehabilitation of stroke patients who are coping with paralysis on one side of the body. In the long term, the researchers expect to achieve many more applications, for example in sport at the highest level. Xsens, a University of Twente spin-off company, is bringing the shoe onto the market.

Many patients who have suffered a stroke are left with a degree of [paralysis](#) on one side of the body. During their [rehabilitation](#) process, they often have to learn to walk all over again. For successful rehabilitation, it is useful to be able to determine exactly how someone is walking at a given moment. What precise movements are being made?

How much force is being exerted on the ground and at which moments? Until now, such analysis could only take place at an expensive specialized movement laboratory. Such state-of-the-art facilities are few and far between.

Researchers from the University of Twente's MIRA research institute have now developed a [shoe](#) which contains all the technology needed to carry out such an analysis, enabling it to take place at any rehabilitation centre or nursing home. The shoe contains four sensor modules, at the heel and the front of the foot. In turn, these modules contain a range of [sensors](#) which measure such aspects as force and movement. The data collected by the shoe can be sent to a computer through a wireless connection.



The shoe has been developed by the University of Twente in cooperation with Xsens, a spin-off company of the university, and Roessingh [Research and Development](#). Xsens is bringing the shoe onto the market under the name ForceShoe. In the years to come, within the framework of the European project Interaction, a new shoe will be developed which patients can also use at home in their everyday lives.

In addition to rehabilitation, Prof. Peter Veltink believes that a range of other applications are possible. "Ergonomics is an interesting area, for example. You can use the shoe to form an objective impression of the physical burden placed on people in their work situation. This is something that insurance companies are very interested in." Prof. Veltink also sees long-term possibilities in top-level sport. "But for this application we have to find a way to further reduce the size of the sensor modules. That's an innovation we are currently working on."

Provided by University of Twente

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