



## World's First Prosthetic Leg with Real Sense of Feeling

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For people who have lost a limb it is no longer imperative that they may lose feeling too. Researchers, at the University of Austria, are reporting the installation of the first prosthetic leg with the ability of letting the wearer feel the ground beneath. The device has sensors at the bottom of the soles that detect pressure differences applied throughout the foot. Before the fitting, the patient had a targeted sensory reinnervation procedure performed that transferred nerves in order to reactivate the nerves that led to the original foot.

Reinnervation is the restoration of nerve function after it has been lost. Reinnervation may occur spontaneously, since it is known for people to recover from nerve damage, or be achieved by nerve grafting (As it was in this case). For people that have lost upper body limbs this means that they too will be able to regain sensitivity. This is beneficial as now users of prosthetic limbs can gauge if they are touching the object, gripping correctly but also it gives them the sensation of having their limb, which is the most appreciated part of the sensitive limb.



The sensors in the prosthetic are therefore now able to send their data to the nerves, via converted signals since our nerves do not read electricity, and so create actual natural sensations of what a real foot would feel when walking over terrain. They showed in the initial patient that the technology allowed the wearer of the prosthetic to be able to more easily walk, climb, and do things that otherwise would require quite a bit of practice to get right.

In addition, the neural reinnervation procedure resulted in less pain for the patient that often occurs from neural scarring. The researchers believe that these new advancements will also help alleviate phantom limb pain, a pain that casualties often feel for extended periods of time having lost that limb. By actually using the nerves that used to work with the missing feet this pain is replaced with sensation.

According to information from the National

Center for Health Statistics 50,000 amputations happen every year in USA. This technology will reach many people however it is still in early stages. Currently any user is able to feel the sensation of pressure, but is unable to feel texture and temperature, while also it has yet to be implemented to an artificial hand (since it is more demanding to successfully link the nerves accordingly with an artificial hand to produce a similar sensation). However, in time they hope to restore the full capabilities of a real sensitive limb to a prosthetic one, and even have limbs that are able to move by control of the patient's nervous system.