



## Navigation through vibration: VibroTac supports the blind and visually impaired

25 September 2012

The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) has developed VibroTac (Vibrotactile Feedback), a device to support blind and visually impaired people in their daily lives. The aim is to communicate a variety of information to the wearer of the device through vibration, known as 'vibrotactile feedback'.

Through the use of the VibroTac, a device developed by the DLR Institute of Robotics and Mechatronics, the user receives information about directions and distances that can be followed to reach a specific destination with the help of a navigation system. With a Smartphone interface, VibroTac can display GPS data, which can help blind people to navigate with relative ease through a new city. To accomplish this, short stimulations are provided by six vibration motors built into a wristband.

This enables VibroTac to transmit information to the user via an alternative sensory channel, and to do so in an 'intuitive' manner. VibroTac is not intended to be a substitute, but rather a supplement to the emblematic white walking stick, as obstacles such as traffic lights or objects on the pavement cannot be transmitted by GPS. "This system supports blind people, enabling them to find their way in an unfamiliar environment, and with the great advantage that the acoustic sensory channel – that is, the sense of hearing – is not compromised," states Simon Schätzle, responsible for VibroTac at the DLR Institute of Robotics and Mechatronics.

### **VibroTac also helps blind people to integrate effectively in the workplace**

Furthermore, the directional and distance-related instructions conveyed by VibroTac can guide the hand of the user to a specific position. That enables workplaces such as merchandise dispensing locations to be optimised for blind people. To accomplish this, VibroTac does not communicate by means of GPS, but instead by means of information stored in the computer.

The blind person is thus able to remove goods from individual shelving units and give them to another person. 'Goods' in this sense might be books in a library or office products in an industrial context. What was previously accomplished with voice commands can now be achieved with VibroTac.

### **From space to life on Earth**

VibroTac is a novel device in the form of a wristband capable of transmitting information, whose origins lie in the telepresence concept employed by space robotics. The original aim of this technology is to use human-system interfaces to equip an operator with the best possible access to remote worlds. In space travel, telerobotics is a key technology used for the construction, maintenance and reparation of satellites and space stations. Building upon this experience, the development process of VibroTac takes due account of ergonomic product design as well as human perception.

In a number of different studies, the 'density' of stimulation points was investigated to learn more about resolution and the ability to perform spatial differentiation tasks with the VibroTac worn in different locations (wrist, forearm, upper arm), and to generate stimulation patterns optimised to suit different applications.

## VibroTac wins the 2012 Innovation Prize

On 25 September the VibroTac project was awarded the 2012 Innovation Prize by the Gesellschaft für Freunde des DLR e.V., the 'Society for Friends of DLR'. This prize for innovation recognises the exemplary collaboration between the DLR and industry. Motivated by the innovation prize and by the large amount of positive feedback, a 'productisation' and marketing strategy was devised with the existing DLR SENSODRIVE spin-off.

This will be implemented in the context of a licence agreement between DLR and SENSODRIVE over the next two years. As well as the usage rights and technological expertise, the licensee can also access the existing network of future end users and system suppliers such as Handy Tech Elektronik GmbH and Dräger & Lienert.

For this, initially and until the end of 2012, SENSODRIVE will be constructing further VibroTac prototypes with the first improvements such as the implementation of a Bluetooth interface. "Our main objective and our motivation is to make daily life easier for people with impaired vision and hearing through the use of VibroTac technology," states SENSODRIVE CEO Norbert Sporer.

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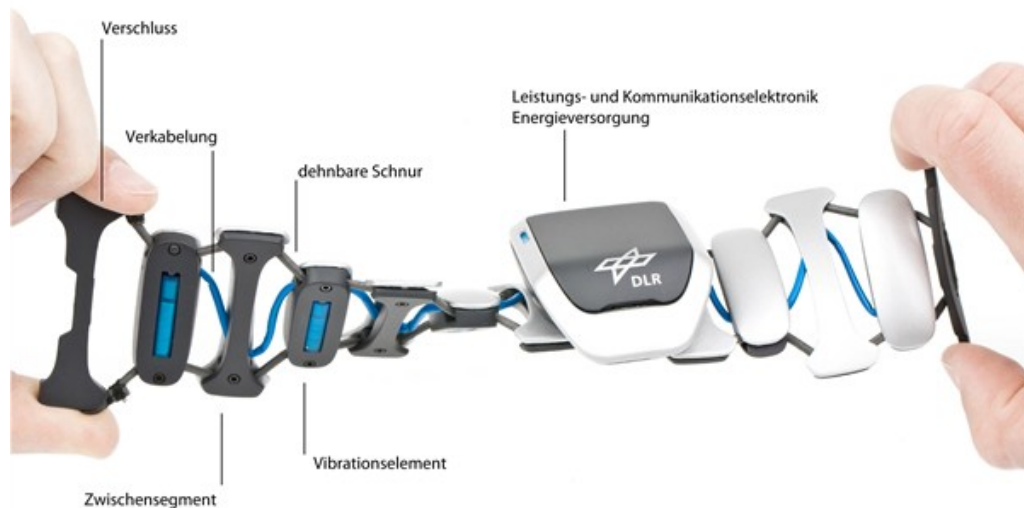
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### VibroTac, a modern device



The VibroTac device consists of the latest technology, through its product-oriented and ergonomic design, as well as its great versatility in real-life applications.

Credit: DLR (CC-BY 3.0).

## From space to life on Earth



VibroTac is a novel device in the form of a wristband capable of transmitting information, whose origins lie in the telepresence concept employed by space robotics.

Credit: DLR (CC-BY 3.0).

## Support for visually impaired and blind people



The directional and distance-related instructions conveyed by VibroTac can guide the hand of the user to a specific position. That enables workplaces such as merchandise dispensing locations to be optimised for blind people.

Credit: DLR (CC-BY 3.0).

## VibroTac is able to display GPS data



Information is transmitted by what is known as vibrotactile feedback.

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