

Enabling the blind to find their way

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(PhysOrg.com) -- “Eyes on the future” is the mantra of the ‘World Sight Day’ held this month to raise awareness of blindness and vision impairment. New technologies, developed by European researchers offering the visually impaired greater independence, live up to this vision.

Many of the most innovative systems have been created by a consortium of companies and research institutes working in the EU-funded ENABLED project.

The project has led to 17 prototype devices and software platforms being developed to help the visually impaired, two of which have been patented.

Guide dogs, canes, Braille and screen readers that turn digital text into spoken audio all help to improve the lives of the blind or severely visually impaired, but none of these tools can make up for having a friend or relative accompany a blind person around and assist them in their daily life. However, a human helper is not always available.

“Blind people often have to rely on others to do things that we do naturally... and that restricts their independence,” explains Wai Yu, the project’s coordinator and a researcher at the Virtual Engineering Centre at Queen’s University in Belfast.

Activities that the sighted take for granted, such as going for a walk in the park or trying out a new restaurant, becomes an odyssey for the

visually impaired, particularly when they do not already know the route by heart.

A guide dog can help them avoid dangers in the street, be it a curb or a lamppost, but it cannot show them a new route. People can be asked for directions, but following them is another matter entirely when you cannot read street signs or see landmarks.

Bridging the information gap

Those barriers have typically prevented the visually impaired from exploring the world around them on their own, but now, with the new technologies, they can surmount some of these barriers.

“Our goal was to give blind people more independence by helping to bridge the information gap with the sighted,” Yu says.

To achieve that, the project partners worked in two broad areas. On the one hand, they developed software applications with tactile, haptic and audio feedback devices to help visually impaired people feel and hear digital maps of where they want to go. On the other hand, they created new haptic and tactile devices to guide them when they are out in the street.

Maps you can feel

One of the patented prototypes, called VITAL, allows users to access a tactile map of an area. Using a device akin to a computer mouse they can move a cursor around the map and small pins will create shapes under the palm of their hand.

The device could produce the sensation of a square block to define a

building, or form into different icons to depict different shops and services – an ‘H’ for a hospital, for example.

“Braille readers and audio readers let blind people read or hear text from computers and the internet, but until now there has been no easy or practical way to portray graphical information,” Yu says. “We chose to work with maps because they are particularly useful for visually impaired people.”

Having obtained a ‘mental image’ of the map from the computer, users can then take the route information with them when they venture outside. For that purpose, the project partners used a commercially available navigation aid called the Trekker, which uses GPS to guide users as they walk around, much like a navigation system in a car.

An electronic guide

However, the Trekker gives only spoken directions, something that can be disconcerting for blind people, who may not want to draw attention to themselves. The device can often be hard to hear in noisy, city environments.

The ENABLED team therefore developed prototypes to provide directions through tactile and haptic feedback, rather than via audio alone.

One patented device developed by the project team, the VIFLEX, looks similar to a TV remote control with a movable plate at the front. The user rests his thumb on the plate, which tilts in eight directions to guide users based on the directions given by the Trekker.

“It is more discreet and natural than following audio commands,” Yu says.

The aim of the ENABLED team's research is not to replace tried and tested aids for the blind, such as canes and guide dogs, but to complement them with new technologies that can improve the independence and autonomy of the visually impaired.

For the visually impaired worldwide, such technologies should start to become a reality over the coming years as the applications developed by the ENABLED team make their way into commercial products.

Provided by [ICT Results](#)

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