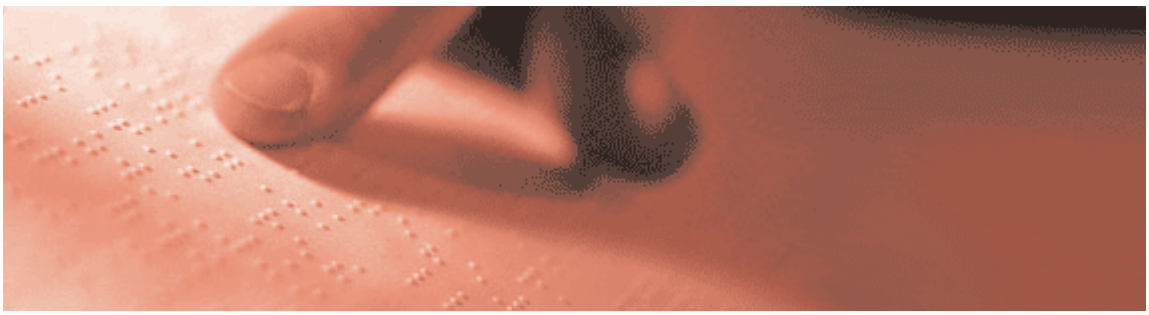

Seeing streets - new satellite system helps blind people navigate

Space age satellite technology, a wireless internet connection and a hand-held computer have combined to provide a revolutionary navigation system for blind people, now on sale in Spain...

Developed through a partnership between the European Space Agency (ESA), Spanish IT company GMV Sistemas (whose partner companies make in-car satellite navigation systems) and then tested by Spanish association for blind people ONCE (Organización Nacional de Ciegos Espanoles), the system retails for around €600 (£450).

So far it is limited to Spanish language speakers, but Javier Panijua at GMV Sistemas believes other languages will be available by the end of this year. Italian and Portuguese speakers may be the next to benefit.

Technically, the system relies on its wireless internet connection to maintain a constant link between the user and the satellite. Tall buildings in cities mean that GPS links can be interrupted and potentially leave someone stranded. This is known as the 'canyon' effect. ESA created a complementary technology called SISNet (Signal in Space through Internet) which relays satellite signals in real time over the internet using wireless networks.

Pinpoint location

GMV Sistemas created a Braille keyboard, voice synthesiser and GPS receiver – altogether called Tormes after a 16th century Spanish story – to enable blind people to navigate city streets with confidence.

Whereas traditional GPS technology is only accurate to within around 15 or 20 meters, Tormes can pinpoint location to within two meters, according to ESA. The agency developed a more refined system called EGNOS (European Geostationary Navigation Overlay System) which augments the GPS system and verifies that its information is correct.

"When blind people take a taxi, they will be able to give the driver directions," said Jose Luis Fernandez Coya, who heads the research and development department of Spanish association ONCE. Tormes gives users constant updates on their location, which street they are on, which buildings are nearby and when they are approaching a junction.

In addition, the internet connection allows many other functions to enhance personal navigation. "When you are connected to the Internet you can also send messages back," pointed out Javier Ventura-Traveset at ESA. "You can ask for directions to a particular place or say that you are lost or have had an accident. By connecting the world of navigation with the internet we are opening up many new possibilities."

Canadian development

In a similar development, Canadian company VisuAide launched its own GPS navigation system for blind people this year, the 'Victor Trekker'. This is a personal digital assistant (PDA) with talking menus, maps and GPS information. It weighs just 600 grammes – whereas Tormes is around 950 grammes - and allows blind people to locate their position, create their own routes and search through a database for points of interest such as restaurants or hotels.

Yet the Victor Trekker suffers from disadvantages, because GPS coverage can be erratic and less accurate than Tormes, meaning that it could tell you which road you are on, but not which side of the road. It may also cost more than Tormes – a price quoted earlier in 2003 was $1,500 (£1,100). And Pulsedata, a New Zealand IT company which makes a Braille memo PDA called Braillenote, has also seen the potential of GPS based navigation systems. Users can pay £600 extra for the GPS update.

Neither VisuAide nor GMV Sistemas claim that their products will replace the white cane or the guide dog, since they cannot alert users to objects such as lamp posts or kerbs on a pavement, which canes and dogs can help avoid.

"We don't tend to envisage these GPS devices as primary aids," said Richard Long, orientation and mobility specialist at Western Michigan University. But they certainly give blind people increased freedom and mobility, allowing them to navigate large open spaces for example. And they can give blind users some unusual insights: "Someone could use the device to tell if his wife is speeding on the way to work," said Richard.

"Whichever device is most used by blind people, the possibilities of satellite navigation are due to mushroom within a few years when Galileo, Europe's own dedicated system comes into operation. It will comprise 30 satellites in medium-Earth orbit, with an associated network of ground stations. ESA calls the system an "independent, civilian-controlled positioning service worldwide with metre-scale accuracy."

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