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Wearable satnav system to help blind people handle new terrain

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A computerised tracking system is being developed to help blind people navigate in unfamiliar territory. The prototype system guides the user through a cluttered landscape such as a city street by giving audio cues.

The researchers say the System for Wearable Audio Navigation or Swan could also be used in other situations where vision is impaired, for example by firefighters and soldiers.

The prototype incorporates satellite technology, using information from two or three GPS trackers, with four cameras placed on the user's body, a digital compass, a light sensor and a head tracker which works out which way the user is facing. This information is put together by a laptop carried in a rucksack which computes the user's location and directs them on their desired route through a virtual representation of the landscape.

The user responds to noises produced by so-called "bone microphones" that send signals via vibrations through the skull rather than fitting into the ears.

"You bypass the normal hearing mechanism and you create the same perceptual phenomenon through a different way," said Bruce Walker, one of Swan's developers at the Georgia Institute of Technology in the US. Eventually, the scientists hope to produce a system using tiny cameras worn in eye glasses or a lapel pin.

The device produces two sorts of sounds. First there is a repeated pinging beacon which guides the user to their desired location. The bone microphones are adjusted so that it sounds to the user like the pinging is coming from a point a metre away from them in the direction they need to go. The alternative, adopted by other systems that are already available to buy, are essentially pedestrian versions of car satellite navigation. The other sounds given off by the device refer to nearby objects such as lampposts, or post boxes. Each has a different signature sound and appears to come from where the object is relative to the user.

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