New tactile user interface for a smart guide cane

For indoor and outdoor mobility we need momentary information as to obstacles and as to route to take. For this, a number of technologies is available such as radar for obstacle detection[1], GPS for route finding, and transponders for vehicle identification. Together, these have the potential to provide the opportunity for independent travelling to people with serious visual restrictions, and to other people as well. An integrated solution can be envisaged to make this true. This is the concept of 'I-Cane', promoted by a German-Dutch foundation of the same name[2].

User interface of guide cane. The arrow pointing in the correct and safe walking direction is felt by the thumb

The user interface of I-Cane is a crucial element. Extra auditory information is an insufficient solution since useful echo's become less audible and the external environment may be noisy. Tactile information seems a better choice. This has been proposed in a recent thesis[3]. A tactile display in the handle of a cane makes an arrow rotate in the safe walking direction that is to be felt by the thumb.

The concept has been worked out in a prototype that has been tried out in an experiment by blindfolded subjects. The arrow was controlled by radiographic information. Without prior training, four out of five subjects had no difficulty walking with this navigation aid; one had difficulty in feeling the direction of the arrow.

The concept seems highly suitable for further evaluation and optimisation not only of the user interface itself but rather of the concept as a whole. The I-Cane foundation has set itself the task of making this true by finding financial means for supporting the necessary R&D.

References

1. www.soundforesight.co.uk; Retrieved October 25, 2006
2. www.i-cane.org; Retrieved October 9, 2006
3. Wilt MAM de. Intelligent cane for the visually impaired. Master thesis. Delft: Faculty of industrial design engineering, Technische Universiteit Delft; 2006 (January 20)

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