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Professor working on seeing-eye glove

Camera-aided system will help visually impaired

BY THE CANADIAN PRESS

GUELPH, ONT.

Researchers at the University of Guelph are developing a camera-assisted navigation system for the visually impaired.

The technology is "the logical extension of the walking cane," said Prof. John Zelek.

The system provides visually impaired people with tactile feedback about their immediate environment.

Two mini video cameras wired to a portable computer — all of which can be worn on the user's body — feed information into a special glove worn by the user.

The glove has vibrating motors sewn into each finger; they send impulses to the wearer, warning of obstacles and terrain fluctuations ahead.

"Traditional navigation systems provide auditory feedback, and they usually have a steep learning curve and overburden the auditory channel," said Zelek. "We wanted our system to be intuitive for the user."

Images from the cameras are processed in the computer and translated into information about the location of obstacles within the camera's range, up to about nine metres.

Then, the buzzer on the finger corresponding to the direction of that obstacle is activated.

For example, if the glove is worn on the left hand, an obstruction lying straight ahead would trigger the buzzer on the middle finger.

If the obstacle is just to the right of centre, the buzzer on the index finger would vibrate.

"The stimulus on their fingers is used to direct the user around obstructions in their path," said Zelek, who is also investigating possible new methods of conveying terrain information through a subset of the buzzers.

Zelek's technique of acquiring information about the environment is unique because of his use of dual cameras, which perceive depth like a pair of 3-D glasses.

Traditional techniques of information-gathering usually employ sonar or ultrasound waves, which are bounced around objects in the room, similar to a bat's method of navigation.

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Seeing glove will assist visually impaired

The glove has vibrating motors sewn into each finger

THE CANADIAN PRESS

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Seeing-eye glove to aid visually impaired

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Images translated

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But these methods of sensing can be easily foiled by complex surroundings, such as a room full of people, where movement creates multiple signals and provides little useful information about obstacles.

"In the case of sonar, busy environments cause multiple signals to back to the user, which can get ...ing," Zelek said.

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University professor works on special glove for visually impaired

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Guelph prof. working on seeing eye glove for visually impaired

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— *Canadian Press*

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A seeing-eye glove for visually impaired

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"In the case of sonar, busy environments cause multiple signals to get back to the user, which can get confusing," Zelek said.

As well, sonar and ultrasound systems consume a lot of energy and need to be recharged every few hours.

Zelek and his research team decided their navigation system had to be wearable, comfortable and affordable.

"If it isn't comfortable, no one is going to want to use it," he said. "The system can't intrude on the user's daily activities."

(Guelph Mercury)