

Professor working on seeing-eye glove Camera-aided system will help visually impaired

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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 a auditory feedback, and they usually have a steep learning curve and overburden the auditory channel," said Zelek. "We want 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 a point in time. Then, the buzzer on the finger corresponds 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 to the right of centre, the buzzer on the index finger would vibrate.

"The stimulus on the 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 pair of 3-D glasses. Traditional techniques of information-gathering usually employ sonar or ultrasonic waves which are bounced around objects in the room, similar to a bat's method of navigation.

Seeing glove will assist visually impaired

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Two mini video cameras fixed to a portable computer, all of which can be worn on the user's body — led to the development of a system to help visually impaired people with tactile feedback. The system provides visual information about their immediate environment. The glove has vibrating motors sewn into each finger. The user can feel the location of obstacles within the camera's range, up to about nine metres. Then, the buzzer on the finger corresponding to the obstacle would trigger the buzzer on the middle finger. 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 Zeek, who is also investigating possible new methods of conveying terrain information through a subset of the haptic Zeek's technique of acquiring information about the environment 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-eye glove to aid visually impaired

By GUY PAT O'NEILL
The University of Guelph

Researchers are developing a system for the visually impaired that provides nearly instant feedback about their immediate environment. The system, called "The Seeing Eye Glove," was developed by Prof. John Zelek, a professor of psychology at the University of Guelph. Two mini video cameras are mounted on the glove, which sends information into a special computer. The computer processes the information and sends it back to the user. The glove has vibrating motors on the fingers and a speaker that provides auditory feedback. The system is designed to help visually impaired people navigate their environment. "Traditional long-stick systems provide auditory feedback, and they usually have a steep learning curve," said Zelek. "We wanted our system to be intuitive. 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 right ahead would trigger the buzzer on the middle finger. If the obstacle is just to the right or left, 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 zero methods of conveying terrain information through a subset of the buzzer. Zelek's technique of acquiring information about the environment is similar to the use of a dial or ultrasonic waves, which are bounced around objects in the room. "Traditional techniques of navigation gather information about the room, but these methods of sensing can be easily fooled 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, multiple signals to the user, which can be back to the user," Zelek said.

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University professor works on special glove for visually impaired

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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.