

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. Vibrating motors sewn into each finger send impulses to the wearer, warning of obstacles and terrain fluctuations ahead.

"Traditional navigation systems provide a steep feedback 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. 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.

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Seeing glove will assist visually impaired

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The glove has vibrating motors sewn into each finger. The technology is the brainchild of John Zelek, a professor at the University of Waterloo, Ontario, Canada. Zelek's research is in the area of assistive technology for visually impaired people. He has developed a system that provides tactile feedback to the user. The system consists of a portable computer, a video camera, and a glove. The glove has vibrating motors sewn into each finger. The user wears the glove and the computer processes the video information to detect obstacles. The system provides tactile feedback to the user through the vibrating motors. For example, if the glove is worn on the left hand, an obstruction lying ahead would trigger the buzzer on the middle finger. If the obstruction is just to the right of the center, 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. Zelek's technique of acquiring information about the environment is a 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 par's method of navigation.

Seeing-eye glove to aid visually impaired

By [Name]
The University of Guelph

Researchers are developing a system for the visually impaired, called the "Seeing-eye glove," said Prof. John Zelek. The system provides visually impaired people with tactile feedback about their immediate environment. Two mini video cameras are fixed to a portable computer, they send information into a special glove worn by the user. The glove has vibrating motors in each finger, they send information into the user's hand. The glove has terrain indicators and provides a steep learning curve. "Traditional language systems usually have a steep learning curve and prohibit the auditory channel," 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 lying straight ahead would trigger the buzzer on the index finger. If the obstacle is just to the right of centre, the buzzer on the middle finger would vibrate. "The stimulus on their fingers is used to direct the environment is 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 called "2-D glasses." Traditional techniques of navigation-gathering usually employ sonar or ultrasound waves, which are bounced around objects in the room. But these methods of sensing can be easily fooled by complex surroundings, such as a room full of people. "Improvement creates multiple signals and provides little useful information about obstacles. In the case of sonar, multiple signals to the user, which can be sent back to the user," Zelek said.

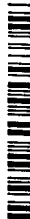
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University professor works on special glove for visually impaired

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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.

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