

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-aided 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 learning curve and are often cumbersome 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.

The Sun Times
Over Sound ON
Circulation: 18,200 (343)
20 Jun 02
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Seeing glove will assist visually impaired

The glove has vibrating motors sewn into each finger

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. The system provides visual information about the user's body — head, torso and arms — to a portable computer. The computer then sends the information to a small, palm-sized device worn on the user's hand. The device has two mini video cameras fixed to it. The glove has vibrating motors sewn into each finger. The motors vibrate when the user's hand is near an obstacle. The vibrations are triggered by the computer, which receives information from the cameras. The computer also provides information about the location of obstacles within the camera's range. For example, if the glove is worn on the left hand, an obstruction lying ahead of the user would trigger the buzzer on the middle finger. If the obstruction is just to the right of the user, the buzzer on the index finger would vibrate. The stimulus on the fingers is used to direct the user around possible obstructions in their path, said Zelek. Zelek's technique of acquiring information about the environment is a unique technique of information gathering usually employed by bats and dolphins. 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 [Name] and [Name]
The University of Guelph

Researchers at the University of Guelph are developing a technology to help the visually impaired navigate their environment. The system, called "The Seeing Eye Glove," was developed by Prof. John Zelek and his team. It consists of a portable computer, a special glove, and a video camera mounted on the user's head. The glove has vibrating motors on each finger, which send information to the user's brain about their surroundings. The system also provides auditory feedback through a speaker. "Traditional large-scale systems provide auditory feedback, and they usually have a steep learning curve," said Zelek. "We wanted our system to be intuitive. Images from the camera are processed in the computer and translated into information about the location of obstacles within the user's range of vision. Then, the glove is worn on the left hand, and the camera is mounted on the right hand. When the user moves their hand, the glove vibrates to indicate the direction of the obstacle. For example, if the glove vibrates on the left hand, it means there is an obstacle ahead. If it vibrates on the right hand, it means there is an obstacle behind. The stimulus on their fingers is used to direct the user around the obstacle. Zelek, who is also investigating possible methods of conveying terrain information through a subset of the glove's techniques of acquiring information about the environment, said, "Traditional techniques of navigation-gathering usually employ sonar or ultrasonic 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. Our glove provides multiple signals to the user, which can be used to cause multiple signals to be sent back to the user, which can be used to cause multiple signals to be sent back to the user."

Bowdens

416-750-2220

NATIONAL

The Daily News
Kamloops, BC
Dailies (293)
Circulation: 18,500

19 Jun 02 260281



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University professor works on special glove for visually impaired

GUELPH, Ont. (CP) — 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.

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416-750-2220

NATIONAL

Brandon Sun
Brandon, MB (317)
Dailies
Circulation: 15,312

19 Jun 02 256799



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Guelph prof. working on seeing eye glove for visually impaired

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— Canadian Press



A seeing-eye glove for visually impaired

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GUELPH, Ont. (CP) —

Researchers at the University of Guelph are developing a camera-assisted navigation system for the visually impaired. The system provides visually impaired people with walking cane, said Prof. John Zelek. The system provides visually impaired people with tactile feedback about their immediate environment. Two mini video cameras are wired to a portable computer — all of which can be worn on the user's body. The glove has vibrating motors sewn into each finger; they send impulses to the wearer's wrist. "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 middle finger is used to direct the direction of that obstacle is just to the right of centre. For example, if the glove is worn on the left hand, a buzzer on the index finger would vibrate. If the stimulus on their fingers is used to direct the buzzer on the index finger would vibrate. The stimulus around obstacles in their path, said Zelek. "The stimulus is unique because of his use of dual user around terrain information through a subset of 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 bar's method of navigation about obstacles. Zelek's technique of acquiring information about 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 get back to the user, which can get confusing," Zelek said. "The system can't intrude on the user's daily activities."

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)