

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-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.

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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, which can be used to provide tactile feedback to the user. 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 human-computer interaction, and he has developed several systems for assisting visually impaired people with their daily lives. One of his most recent projects is a portable computer system that can be worn on the user's body. The system provides a range of information about the user's environment, including the location of obstacles and the direction of that obstacle. The glove is worn on the right hand, and the vibrating motors are sewn into the index, middle, and ring fingers. When an obstacle is detected, the motor in the corresponding finger vibrates, alerting the user to the presence of the obstacle. Zelek says that the system is designed to be used in a variety of situations, from navigating a crowded room to finding a specific object in a large room. The system is currently being tested in a laboratory setting, and Zelek expects to release a commercial version of the system in the near future. The system is a significant step forward in the development of assistive technologies for visually impaired people, and it has the potential to greatly improve their quality of life.



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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 uses a glove to provide tactile 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, and they can be worn on the user's wrists. The glove has vibrating motors on the fingers and the back of the hand. The user wears a portable computer system that provides information about the user's surroundings. The system sends information to each finger, which is processed by the user. The glove has a keypad and a speaker. The user can use the keypad to control the system. The speaker provides auditory feedback. The system is designed to help visually impaired people navigate their environment. It can detect obstacles and provide information about their location. The system is currently being tested in a laboratory setting. Prof. Zelek says that the system has the potential to be used in a variety of settings. It could be used to help people with visual impairments navigate their homes, workplaces, and public spaces. The system could also be used to help people with visual impairments learn to use a computer. Prof. Zelek says that the system is a significant step towards providing a more independent and accessible environment for visually impaired people. He says that the system is a result of a long-term research project that has been funded by the Canadian Institutes of Health Research. The system is currently being tested in a laboratory setting. Prof. Zelek says that the system has the potential to be used in a variety of settings. It could be used to help people with visual impairments navigate their homes, workplaces, and public spaces. The system could also be used to help people with visual impairments learn to use a computer. Prof. Zelek says that the system is a significant step towards providing a more independent and accessible environment for visually impaired people. He says that the system is a result of a long-term research project that has been funded by the Canadian Institutes of Health Research.

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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.

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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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Guelph prof. working on seeing eye glove for visually impaired

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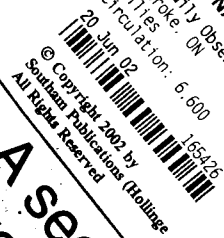
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— Canadian Press



A seeing-eye glove for visually impaired

M2086
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 index finger would vibrate. 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 obstacles in their path," said Zelek. "The stimulus 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 a room full of people. 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. "In the case of sonar, busy environments cause complex surroundings, such as a room full of people, where little useful information about obstacles is conveyed," 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)

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Seeing-eye glove in the works

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Researchers test seeing-eye glove to guide the visually impaired

Computer, mini video camera sewn into a jacket
translate images, send vibrating signals to fingertips

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Mr. 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.

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 get back to the user, which can get confusing," Mr. Zelek said.

As well, sonar and ultrasound sys-

tems consume a lot of energy and need to be recharged every few hours.

Mr. 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."

The stereo-vision prototype is built from inexpensive, off-the-shelf components. New technology — mini-cameras, in particular — will allow the navigation system to be very discreet.

Advanced technology allows the computer to be small, about the size of a deck of cards, and consume very little power. The cameras can be mounted on shirt buttons, and the whole unit can be sewn into a jacket.

"The trial stage will determine how useful this system is," Mr. Zelek said. "In the end, it's the user who decides whether or not this system will work."

The Waterloo, Ont., office of the Canadian National Institute for the Blind has a group of people who are eager to try out the prototype device.

The Guelph Mercury



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Researchers working on seeing-eye' glove

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High-tech glove allows blind to 'see'

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