

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. 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 step-by-step 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 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 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 people with disabilities. He has developed a number of devices to help people with visual impairments navigate their environment. One of his latest projects is a glove that provides tactile feedback to visually impaired people. The glove is made of a soft, stretchable material and has a series of small, vibrating motors sewn into each finger. The motors are connected to a small, portable computer that is worn on the user's wrist. The computer is connected to a video camera that is mounted on the back of the hand. The camera captures a 3D image of the user's surroundings. The computer then processes this image and provides tactile feedback to the user. For example, if the user is walking towards a wall, the computer will vibrate the motors on the fingers of the hand that is closest to the wall. This allows the user to feel the distance to the wall and adjust their path accordingly. Zelek says that the glove is designed to be used by people who are visually impaired and who are unable to use a cane or a white cane. The glove is currently being tested in a laboratory setting. Zelek hopes to bring the glove to market in the near future. He says that the glove is a significant step towards making the world more accessible for people with disabilities.



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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.

The technology is the result of a team led by Prof. John Zelek.

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

Two mini video cameras are used to provide information into a special glove worn on the user's right hand.

Two pairs of vibrating motors can be worn on the user's fingers to provide information about terrain irregularities and vertical inclinations.

The glove has a keypad that provides tactile feedback and they can be worn on the user's fingers.

Impulses to each finger, they send information into a special glove worn on the user's right hand.

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Images translated

Images from the camera 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 controller 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 or left, the buzzer on the index 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 similar to the use of 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.

"In the case of sonar, busy environments cause multiple signals to be sent back to the user, which can be