

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 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 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-eye glove to aid visually impaired

By GUY PAT O'NEILL
The University of Guelph — Researchers
developed a new way to help visually impaired
people navigate their environment.

The technology is the result
of a team led by Prof. John Zelek, who
developed the system. The system provides visual feedback
about their immediate environment
to a portable computer — all of which
is worn on the user's wrist.

Two tiny video cameras are
used to capture information about the
user's surroundings. The information is
sent to a portable computer, which
processes it and provides feedback to
the user through a series of vibrating
motors on the glove.

The glove has several vibrating
motors, each of which provides
information about the user's
surroundings. The information is
sent to a portable computer, which
processes it and provides feedback to
the user through a series of vibrating
motors on the glove.

Traditional navigation systems
provide auditory feedback, and they
usually have a steep learning curve.
"We wanted our system to be
more intuitive," said Zelek.

Images from the camera are
processed in the computer and trans-
lated into information about the loca-
tion of obstacles within the camera's
range. 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
proportional to the distance of the
obstruction in their path," said
Zelek, who is also investigating possi-
ble zero methods of conveying terrain
information through a subset of the
buzzer.

Zelek's technique of acquiring in-
formation about the environment is
based on the use of a pair of
ultrasonic waves, which are
emitted from the glove and reflect
off of objects in the room.

Traditional techniques of navigation
usually employ sonar, which are
emitted from the glove and reflect
off of objects in the room.

But these methods of sensing can
be easily fooled by complex surround-
ings, such as a room full of people,
furniture and other objects. "In the case of sonar, multiple signals to
information about obstacles, which can be
sent back to the user, which can be
used to determine the location of
obstacles," said Zelek.

Information about the environment is
sent to a portable computer, which
processes it and provides feedback to
the user through a series of vibrating
motors on the glove.

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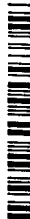
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University professor works on special glove for visually impaired

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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Guelph prof. working on seeing eye glove for visually impaired

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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 the user's body — all of which can be worn on a special glove worn by the user. 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 vibrates. For example, if the glove is worn on the left hand, an obstruction lying straight ahead would trigger the buzzer on the index finger. The stimulus on their fingers would vibrate. If the obstacle is just to the right of centre, the buzzer on the middle finger vibrates. The stimulus on their fingers would vibrate. If the obstacle is just to the left of centre, the buzzer on the ring finger vibrates. The stimulus on their fingers would vibrate.

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 about obstacles. 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," 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."

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Seeing-eye glove in the works

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