



RESEARCH NEWS

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New device makes video games a powerful therapy tool

By Frank Nolan, Research Promotion Officer

Who knew that shooting alien invaders or playing virtual ping-pong could be good for you?

A team of University of Manitoba researchers has created a device that can transform any object into a video game controller, providing physical therapy clients with a fun way to practice specific hand or arm movements or repetitive balance exercises.

"It's a great way to motivate people to do their exercises," said lead researcher Tony Szturm, medical rehabilitation. "It can be a challenge to perform repetitive movements in the clinic for twenty minutes and then come back tomorrow to do it again. By incorporating video games coupled directly to the exercise, we find that a therapy session goes by very quickly for the clients, and they're much more motivated to come back for another twenty sessions."

Szturm's team includes electrical and computer engineering graduate student Chris Otto, and medical rehabilitation graduate student Ankur Desai. The new device is a USB interface built by Otto that connects a motion sensor to a computer, and the motion sensor can be attached to virtually any common object, like a ball, a dowel or even a toy car.

"You can put it on some really interesting things," Szturm said. "We use a lot of Lego to build custom shapes, for instance. You can use objects like corks to practice rotation movements, or you can attach it to a cup, a pencil, or really

anything that will allow for the specific movement you need to practice."

Szturm is currently using a prototype of the new interface to work with clients at the free out-patient clinic run by the Department of Physical Therapy at the University of Manitoba's Bannatyne Campus.

"A lot of the people we work with can't even lift their arms up, and this is a great way to get them to start exercising those muscles," he said. "You can use all kinds of different shapes. You can add things that are slippery, things that are more compliant, large objects, very small objects, things that rotate or things that roll on a table top. We can use virtually any object that meets the therapy needs of the specific person we're working with."

As clients progress, Szturm said, the objects can be changed to fine-tune the desired movements. For example, a smaller ball could be used to further improve a client's grip.

To apply the interactive video gaming approach to balance and stepping exercises, a separate system was developed by electrical and computer engineering graduate student Aimee Betker. This system can be used with a foam pad or irregular floor surface to emulate outdoor walking conditions or for training sitting balance by using it with a large ball. Clients can stand on the foam pad or sit on the ball to control the game by shifting their weight.



Photo by: Frank Nolan

Tony Szturm, medical rehabilitation, demonstrates an interface that allows video games to be controlled by virtually any object—in this case a large cardboard tube.

Szturm's goal is to provide clients with an interface they can take home to use with their own video games.

"Most of these clients aren't going to get better just by coming here to see us," he said. "These exercises really need to be done regularly at home to make a difference. We would like to be able to have clients log in at home so that we can monitor their progress over the Internet, and that's why we've developed a USB device that's external to the computer."

Szturm hopes to further develop the interface so that clients could also connect it to commercial gaming consoles, like an XBOX or a Playstation, which would allow them to play any of their favourite games.

"It's all about using game play to motivate people," he said. "Video games are everywhere and they're inexpensive. When somebody gets bored with one, they can move on to a different game and stay motivated."

Environmental service delivery in northern communities

By Frank Nolan, Research Promotion Officer

In northern Manitoba and Saskatchewan, many Aboriginal communities are faced with poor drinking water quality, overcrowded and inadequate housing, and a lack of environmentally friendly waste disposal systems.

While steps have been taken in recent years to address some of these concerns, many of the new policies have been ineffective, simply because they fail to recognize the many barriers to service delivery that are unique to Aboriginal communities on the northern prairies.

"Yes, federal dollars are being spent on infrastructure, but there are huge gaps," said Shirley Thompson, Natural Resources Institute. "There needs to be a new focus that recognizes the barriers and the knowledge of local people. This requires that communities be involved in designing and implementing their housing, water delivery and other environmental services delivery programs."

Thompson is leading a new research project examining the delivery of environmental services in northern communities from an Aboriginal perspective. The project, funded by the Social Sciences and Humanities Research Council of Canada (SSHRC),

will focus on ways to improve essential services, including drinking water quality, housing, waste water treatment and food security.

Thompson said the project grew out of discussions she had with First Nations communities and Aboriginal organizations.

"It became very clear that lack of infrastructure, including housing and water, are serious problems in themselves, and are not disconnected from social problems," she said. "In meetings with representatives of Aboriginal organizations, community development to deliver environmental services was seen as the solution to alleviate both poverty from high unemployment and the environmental health problems from lack of adequate infrastructure and insufficient training. So with Aboriginal communities and organizations we will find success stories in Aboriginal northern communities, and we will look at how these successful approaches can be adapted and applied elsewhere."

Thompson will be working closely with several Aboriginal organizations, including the Northern Association of Community Councils, as well as a

number of First Nations communities. The two-year project will also include surveys of service providers to determine the quality of training programs and services currently in place.

"This research will really just scratch

the surface to identify the issues and determine what needs to be done. We're really looking at some very basic needs that are essential to improving the quality of life."



Photo by: Frank Nolan

Shirley Thompson, Natural Resources Institute, is looking at ways to improve environmental service delivery to northern communities.

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