Together across a continent: Bridging time and place with 'Shared Spaces'

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From the *Jetsons* to *Back to the Future*, videoconferencing has been a fixture in visions of how we imagine the world of tomorrow. Yet the dream of real-life interactions across a screen has stayed just beyond our grasp. Videoconferencing has remained an artificial experience due to limits of technology. But this is about to change.

"Modern videoconferencing hasn't worked well as it doesn't allow you to interrupt one another and has never managed to support the quality of interaction that people experience in real life. We wanted to change that," says John Roston, director of Instructional Multimedia Services at McGill University.

"Our technology provides a life-size, high-definition view on a large panoramic screen, which gives users the impression that they're talking to people in the same room with a window between them," adds Professor Jeremy Cooperstock of the Department of Electrical and Computer Engineering.

Roston and Cooperstock, members of the Centre for Interdisciplinary Research in Music Media and Technology, see the new technology being used in business, education, health care and many other contexts. They are at the leading edge of a community of researchers who are out to change the current videoconferencing experience by allowing people in different cities to feel as though they are together in the same room.

To show what they can do, Roston and his colleague Jeremy

Cooperstock have arranged for jazz conductor Gordon Foote to teach his music students at McGill all the way from Seattle. Foote will conduct them in real time, coaching and guiding their performance as if they are in the same concert hall.

The event will take place as part of Bandwidth Challenge 2005, an elite annual competition at which nine teams of top scientists will showcase exceptional uses of new technology. The challenge will take place in Seattle as part of Supercomputing 2005, where world experts from academia and industry, including Bill Gates, gather to discuss high-performance computers and networking.

The "Shared Spaces" technology offers a wide panorama view on three 65-inch plasma displays. The Seattle audience will see the entire group of musicians at once, and watch them follow the lead of the conductor without any swiveling or panning of the camera.

The McGill team's videoconferencing breakthroughs have come from their ability to reduce latency — call it Internet friction — to imperceptible levels. This means that a sound or movement in Seattle can be heard or seen in Montreal with no noticeable delay, allowing people to communicate with the same gestures, speech and body language they use in everyday life.

In Seattle, the team will combine their low-latency techniques with what amounts to gallons of bandwidth to produce a veritable life-size concert. The show will be replete with visual detail provided by high-definition video, and an auditory richness offered by surround sound.

Whereas home users of high-speed Internet typically receive three megabits of data per second, the teams in Seattle will draw on transfer speeds that are thousands of times faster. The McGill team will access up to five gigabits per second, using a fibre optic network that carries

information at close to the speed of light.

"Shared Spaces" is only one of several applications of new technologies being employed by the McGill Ultra-Videoconferencing Research Group. The Group draws together top people from diverse disciplines who use technology to understand and enhance human experience. The group's projects also include a live undersea high-definition video camera and remote sign language interpretation for the deaf.

Source: McGill University