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Music: Lab can track movements of performers and audience members in real time

“We expect to find all kinds of things that we just never dreamed of that are going on in these complex interactions,” said Laurel Trainor, a neuroscientist and director of the LIVElab (short for Large Interactive Virtual Environment), which officially opens its doors this week.

In essence, LIVElab is a conventional stage and seating area backed by a powerful combination of high-tech gadgetry for recording and cleverly manipulating the way entire groups of people experience music and other forms of performance or presentation. The sound system can be adjusted to simulate a range of acoustic environments from classrooms to cathedrals.

Although music originated as a social activity, scientific research on music and human cognition had tended to focus on individuals. This is largely because the subtle cues and reactions that occur among musicians as they perform – and between the musicians and their audiences – are difficult to capture in a controlled research setting.

Nearly a decade in the making, the facility was funded through the Canada Foundation for Innovation, the Ontario government

and McMaster. Nothing quite so ambitious has been tried before in the field of music studies and the research possibilities have experts taking notice.

“It’s really an extraordinary achievement,” said Katie Overy, of the Reid School of Music at the University of Edinburgh. “The attention to detail is evident in every inch of the design.”

Dr. Overy, currently a visiting professor at the University of Western Ontario where she is working on research related to musical learning, said she hopes to make use of the lab for pilot studies.

Just entering the LIVElab is a sensory experience. The space is accessed through a “sound lock” which separates participants from the outside world. The room sits on rubber pads to reduce vibrations and is nested inside a suspended concrete shell, which blocks external noise down to a threshold of 10 decibels. Inside, oversized ductwork keeps air circulating without a sound. In other words, it can be very, very quiet.

In its “off” setting, the room is also entirely dead. The walls and surfaces are designed to absorb sound, so that music and voices are swallowed up without any

trace of an echo. “It’s our blank slate,” Dr. Trainor said in the LIVElab earlier this month.

Then Dan Bosnyak, a research scientist and the lab’s technical director, brought the room to life with a few taps on an iPad. Suddenly, an array of microphones and speakers located all around us were sensing and reprojecting our voices, adding a pleasant resonance that perfectly reproduced the experience of being in a small theatre or church.

Such tricks have been employed commercially to enhance the acoustics of various spaces. But in the LIVElab, the sound system is coupled with a battery of infrared cameras that can track performers and audience members in real time and digitize their body movements as they react to music and other stimuli. The lab also has the capacity to measure the

brain waves of up to 30 participants at once through electroencephalography (EEG).

“The great thing about the LIVElab is that it’s very flexible. You can mould the space to fit the project,” said Matt Woolhouse, a faculty member at McMaster’s School of the Arts who is planning a study of dance therapy for Parkinson’s patients.

By its nature, the set-up invites researchers to explore musical questions that have previously been inaccessible to science. For example, they can study how members of a jazz ensemble or a string quartet react to one another while a performance unfolds, or measure how much the physical expressiveness of a musician influences the way her music is perceived by an audience.

All of it involves the broader question of how human brains work together around a shared

activity, which puts the lab at the cutting edge of social cognitive science.

“The lab will undoubtedly become a major centre for inquiry in human thinking and behaviour,” said Robert Duke, director of the Center for Music Learning at the University of Texas at Austin.

For this reason, the space is also attracting interest from marketing and arts groups interested in what it can tell them about group experiences. Dr. Trainor said the lab would ideally be used for commercial projects about one-third of the time to help support its research activities.

“What this space really comes down to is studying interactions,” Dr. Trainor said.

In the process, it may finally reveal what compels humans to gather in groups and make music. All together now.

FROM PAGE 1

Prentice: ‘It’s not about money’

“I have a very strong relationship with First Nations in B.C., particularly on the coast where the problem [opposition to the project] has been centred.”

That relationship was also forged during Mr. Prentice’s time as federal minister of Indian Affairs in 2006-07. After being sworn in as Premier last week, he announced he was taking on ministerial responsibilities for aboriginal relations. (He is also a former federal environment minister.) He said he has already spoken with Christy Clark and the two have begun to build a positive relationship, something that often did not exist between the B.C. Premier and her former Alberta counterpart, Alison Redford.

“My sense is there is a way to firstly address the environmental issues that First Nations have raised,” Mr. Prentice said. He said many “are very good points and we’ve collectively not done a very good job of responding to them, particularly among the Coastal First Nations. People say it’s all about money – well, it’s not about money. It’s actually about ensuring people who have lived on the West Coast of Canada from time immemorial, that their lives are not going to be changed irretrievably by some kind of disaster.”

Under the current Gateway plan, Alberta crude would be loaded onto tankers at Kitimat and then navigate the ecologically pristine waters of Douglas Channel before hitting open ocean. Fears of a spill have been central to virulent opposition expressed by native and environmental groups.

Prince Rupert to the north is one of a few locations that have been discussed as potential alternatives to Kitimat. In the past, Enbridge has said that a route to Prince Rupert, where there is already an established port facility, would be trickier from an engineering standpoint because of the overland terrain that would have to be traversed.

Regarding the possibility of refining the crude in Alberta before shipping it across B.C., Mr. Prentice said the extent to which that might be necessary would depend on where the oil is going to end up on the West Coast. He said there are “multiple possibilities.”

“Not an unlimited number, but there are at least four possible locations for a West Coast terminal and they all involve different environmental risks,” he said.

Asked whether he believes the Gateway terminus should be relocated to Prince Rupert or another destination, Mr. Prentice said, “Everything I’ve heard from the Haisla who live there is they don’t agree with the terminal being in Kitimat.” Is it possible to get First Nations approval if there is no support at the planned terminus site? “It’s pretty tough,” the Premier said.

B.C.’s Ms. Clark was unavailable to comment on Mr. Prentice’s remarks.

In an e-mail statement, Enbridge spokesman Ivan Giesbrecht said federal approval for the project includes a terminus at Kitimat. “At this stage, Northern Gateway has not contemplated any applications to the National Energy Board to change the design,” he said. “Our focus has been to re-engage with First Nations to build trust, establish respectful dialogue and create meaningful partnerships.”

Mr. Prentice said the Gateway terminus, wherever it ends up, will be a huge economic driver. He said there needs to be a discussion about “what’s the role of First Nations going to be, what share of the economic opportunity will they benefit from.” After settling on the terminus, the Premier said, “the rest of it is just a pipeline that’s going to be underground. But the economic driver and the economic benefits really accrue at the coast in a very substantive way.”

He added: “There’s lot of work to be done. I’m under no illusions.”

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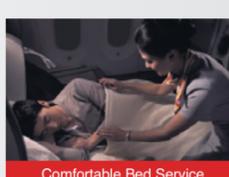


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