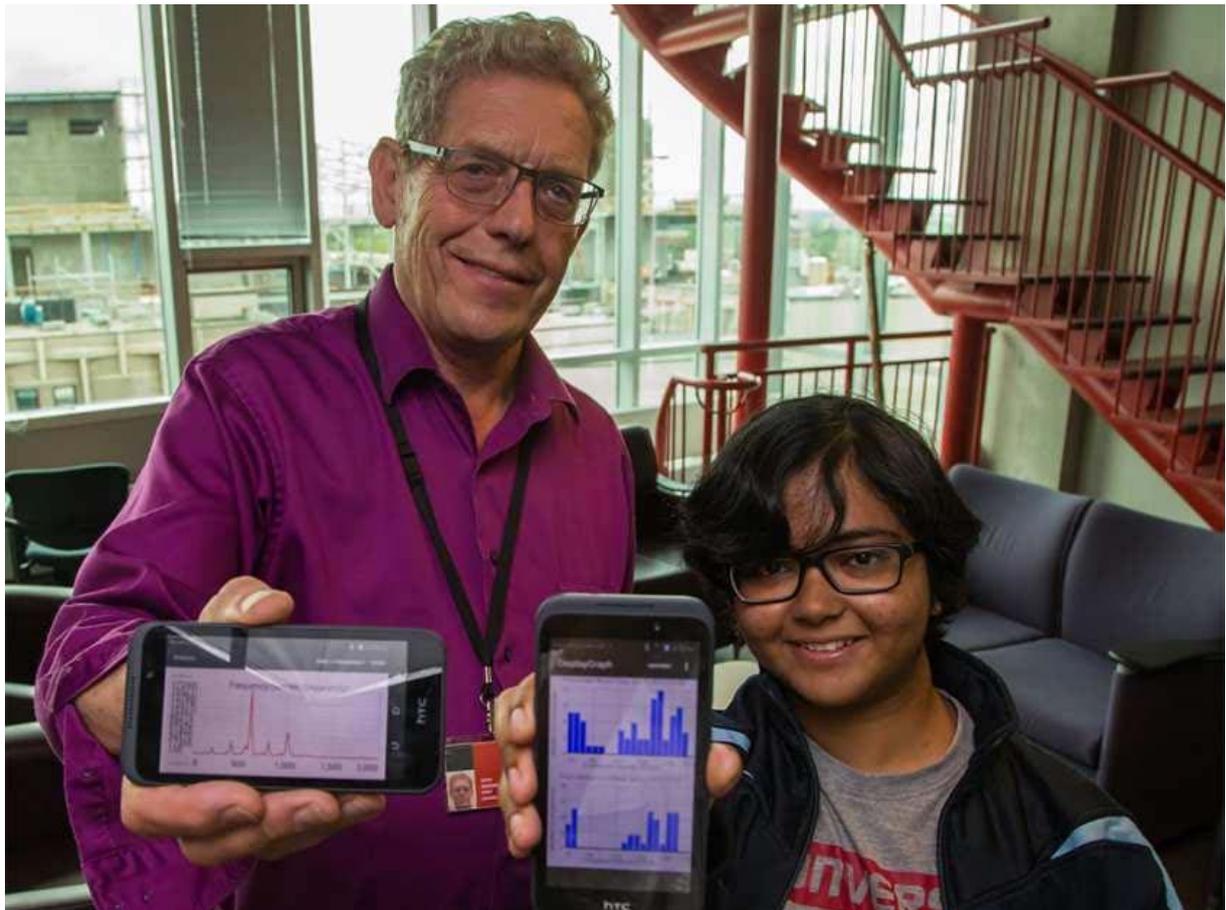


News about Mitacs Globalink research interns

Researchers develop app to record Ranchlands hum

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Dr. Mike Smith, left, and Orchisama Das present an Android app designed to help identify and locate the source of mysterious hums in the community of Ranchlands, at the University of Calgary on Monday, July 27, 2015. ARYN TOOMBS / CALGARY HERALD

If you've ever pressed one of the low keys on a piano softly and felt the note hang in the air, then you know what it's like to hear the Ranchlands hum.

The approximately 40 hertz hum has been plaguing residents of the northwest Calgary community since 2008 and nobody can figure out where it's coming from.

Some people have described it more as a physical vibration than a humming noise. Not everyone can hear the sound and some Ranchlands residents have assumed they have hearing damage or that it's all in their heads.

But the hum is real and really mysterious.

Dr. Mike Smith and his students have spent years trying to help the good people of Ranchlands crack the case.

The research has been on and off and Dr. Smith picks up the project again when an interested student comes along. He started working on the hum, which he has heard in the field, because one of his graduate students, Emily Marasco, had been working in the community already to find the source of the noise.

Right now he's working with Orchisama Das, an international engineering student from India. She's participating in a Mitacs Globalink internship program that accepted her to study in Canada, along with 750 other students. From there, she chose the project she wanted to work on and chose the Ranchlands hum because she's interested in music and engineering.

"There's not many opportunities to combine those two careers," said Smith.

Smith and some of his previous students had started development on a cellphone application that would allow people to record the sound.

"What they want to do is be able to convince people, and convince themselves, that it really, physically is there," Smith said.

"So what we've done, is develop the simple app that will record the sound for them so that they can then play it back to prove to other people, who may not necessarily hear it easily, that it really exists. And they find that a little bit reassuring."

Smith hopes that he and Das can publish instructions to develop the app in Circuit Cellar magazine so they can get feedback on how to improve it. They already gave a copy to one Ranchlands resident who was happy that other people could finally hear the sound.

Das arrived in Canada at the end of May and knew nothing about developing phone apps.

"I specifically wanted to work with audio signal processing, and this is exactly what this project is about," Das said.

"What I didn't know was that it would also involve Android app development. It's something that I completely learned from scratch after I came here."

She taught herself by reading articles that the previous intern, from France, had written about developing the Ranchlands hum recording app and she's now working to expand the app's capabilities.

“His application just captured sound and did a little bit of analysis of what signals were in there and [Das has] been looking at how do you capture many sounds and compare them across a network,” Smith said.

One of the questions they’re hoping to answer is if there is only one source.

“Is there one Ranchlands hum or are there many Ranchlands hums? We just don’t know,” Smith said. The goal is to have many people record the noise and send in their findings so Smith and his students can analyze the data.

“We can compare the sounds to see if there’s more than one of them, capturing many, many sounds at the same time,” he said.

Smith said he used to have a hum at his house near the reservoir, which turned out to be water pumps turning on late at night. Last May, a similar mysterious hum in Windsor, Ont. was traced to a Michigan steel production facility on Zug Island.

The hum has been difficult to pinpoint because it’s so low, Smith estimates about two octaves below middle C, and there hasn’t been much money put toward the problem — some researchers tackling the hum have been volunteers.

“Low frequency sounds they just don’t seem to have any direction to them, it’s very difficult to find where they’re coming from,” Smith said.

Theories on where the Ranchlands hum comes from range from gas pipes to natural vibrations of the Earth shaking concrete pads in some basements.

Once they figure out where the sound is coming from, the Ranchlands neighbourhood can work to address the irritating sound.

“I’ve got recordings. There’s some really weird stuff in people’s homes,” Smith said.

“And it keeps them awake at night ... if you’re very, very sleepy it really affects the whole of your health. So it’s sort of an important health issue.”

Developing diagnostic tools for aggressive skin cancer



Mitacs Globalink research intern develops an image analysis device for early diagnosis of melanoma at University of Alberta

In 2015 alone, it is estimated that approximately 8500 Canadians will be diagnosed with the most aggressive form of skin cancer: melanoma. Often forming from an abnormal mole or lesion on the skin, early detection of melanoma can be life-saving. That is why Mitacs Globalink research intern Suranjana Samanta has dedicated her studies to furthering technologies that can save lives through the accurate and early detection of cancers.

As an electrical engineering student from Jadavpur University in India, Suranjana previously contributed to research on image processing techniques for lung cancer diagnostics. This summer, she is leveraging her understanding to develop a specialized tool for skin cancer diagnosis, under supervision from Professor Mrinal Mandal at the University of Alberta.

Working in tandem with a PhD student, Suranjana is helping to develop a diagnostics system that would connect to a medical-laboratory computer via its USB drive. The system would include specialized image processing software that can analyze an image of a patient's skin at the site of a suspected lesion to provide fast and accurate diagnoses. Once complete, the tool could be sold to medical testing laboratories to provide an important first step for diagnosis that could save laboratory resources and reduce time delays on testing results.

Suranjana is feeling a sense of fulfilment and purpose from her research, saying, "Every day I am doing something wonderful. The reality of what it's like here has far surpassed my expectations!"

She hopes to return to Canada some day for graduate school in biomedical image processing—an opportunity, she says, that would help her to realize her dreams.

Researching the cutting-edge of Canadian technology for the home



06/26/2015

Mitacs Globalink Research Intern develops “smart” home monitoring system at the University of New Brunswick

Umang Yadav wants to be on the cutting edge of technology. An electronics and communication engineering student from Sardar Vallabhbhai National Institute of Technology (Surat, India), Umang has been given the privilege to contribute to the next generation of remote healthcare monitoring technology through Mitacs Globalink Research Internships.

Working under the supervision of Dr. Janet Light and PhD student Ali Reza Manashty at the University of New Brunswick Saint John, Umang and is helping to develop the components of a

comprehensive remote healthcare system designed for senior citizens and physically disabled individuals.

When complete, the “smart” home monitoring system would use a combination of video- or motion-based surveillance systems with biological sensors to detect in-home medical emergencies. The system could then notify caretakers or emergency responders of the incident, potentially saving lives. Umang is currently assisting the team to develop applications that process biological information such as heart rate and blood pressure in real time.

Umang says the experience has been valuable for his eventual career in a biomedical start up. “Having research experience through Mitacs Globalink will be very useful to my career. I couldn’t have learned these same techniques and tools without doing a project like this.”

Electrical vehicle charging stations

Please find an audio of a radio interview with one of Indian Globalink students and his host professor based in Toronto. It will give you an unbiased flavor of the first-hand experience for the participating student and the professor.

Engineering student Shreyas is helping to develop, implement, and monitor electrical vehicle charging stations that rely on solar energy and can be easily replicated for wider, mainstream use. The project is the first of its kind to use ‘made in Ontario-only’ solar system components and addresses limitations found in European-designed solar-based charging stations that don’t always consider Canada’s harsh winter climate.

The host professor says that “Mitacs Globalink could be the finest, one of the most unique programs of its kind in the world because it brings the best talent from the planet right here to Canada.” And, “[As a professor] you have the privilege of selecting from a very talented pool of applicants....Canada is becoming an important destination for top talent in the world.”

Listen the Audio:

<http://www.mitacs.ca/en/newsroom/media-coverage/newstalk-1010-toronto-internship-program-brings-worlds-brightest-minds>