Bringing Research to LIFE

Upcoming Events

Mitacs Globalink 2014 Call for Applications

Are you interested in expanding your research network?

Would your research team benefit from the insight and perspective of an international student?

Would you like the opportunity to evaluate potential graduate students in a hands-on lab setting and access funding to help support them?

Mitacs Globalink is offering Canadian faculty members in science, engineering, mathematics, humanities, and social sciences the opportunity to work with exceptional senior undergraduate students from Brazil, China, India, Mexico, Turkey and Vietnam during a 12-week research project from May to September 2014.

Deadline for online applications: July 31, 2013

For more info: mitacs.ca/globalink/information-canadian-faculty

Bruce D. Campbell Farm and Food Discovery Centre

I Scream for Ice Cream!

July 26

All-day event targeting families with children age 2 to 12.

How does milk become ice cream? Make this delicious dessert using one of our ice cream makers and discover your favourite flavour.

Ice cream making: 10:30 am and 2 pm

Eat your ice cream in a bowl (complimentary) or as an ice cream sandwich (additional charge).

Cost:
$5 youth/seniors
$8 adults
$20 family

For more info: http://umanitoba.ca/faculties/afs/discovery_centre

Science's version of Mr. Fix-It

A childhood spent tinkering—with computers and cars—prepped this medical physics student for his latest challenge: helping doctors better diagnose disease

Faculty of Science PhD student Bryan McIntosh in the John Buhler Research Centre

Photo by Dan Gwozdz

BY KATIE CHALMERS-BROOKS
For The Bulletin

What does a 10-year-old rural kid do when his computer is too slow to play video games? If you're Bryan McIntosh, you get to work tweaking and tuning until you find a fix.

"It was a bit of reading, a bit of trial and error—actually a lot of error," he says, "which prepared me well for a career in science."

All grown up, the medical physics PhD student has since moved on to more sophisticated machines.

He researches an imaging method that uses positron emission tomography (PET). It's a scanning technology used daily in hospitals on patients wanting to know whether or not a lump is malignant or if their cancer has spread. The PET scanner provides doctors with a 3D image of what's happening inside the body.

Patients are injected with a radioactive tracer, which is a compound equipped with a radioactive atom or isotope. As it decays, it emits tiny particles—called positrons. These particles react with electrons, and the reaction produces a pair of light particles (called photons). The PET scanner detects these photon pairs and creates an image, revealing to doctors any abnormalities in the body.

Glucose labeled with radioactive Fluorine-18 is a frequently used tracer because it accumulates in the body's tissues and organs. Since tumours take up more glucose than healthy tissues, they show up brighter on the scan. This tells a doctor if the tumour is growing or responding to therapy.

During the procedure, photons can lose energy causing them to scatter which results in noisy or blurred images. McIntosh and his colleagues at CancerCare Manitoba have developed software that would allow the scanner to figure out where a photon scattered and to correct for it. But this software requires a detector with a higher energy resolution than is currently available.

In search of a solution, McIntosh is designing and building a better detector, one that will allow him and the team to finally test their software. "Once we finish testing a small scale detector, we will scale it up to full size so that we can test the software to see if it works on real data instead of just running simulations," he says.

The ultimate goal? To equip doctors with better quality images so they can better diagnose disease. And to create technology that is faster, less expensive and uses lower doses of radiation, making the process safer for patients. As obesity rates climb, so too does the demand for this technology, McIntosh explains. Because the larger a patient is, the more photons scatter during a scan. "Since scatter gets worse as patient size increases and we are seeing more overweight and obese cancer patients, finding better ways to deal with scatter will be a great benefit…No one else is using this type of scattered-enhanced algorithm."

A PhD student of Prof. Stephen Pistorius (physics and astronomy) and Prof. Andrew Goertzen (radiology, physics and astronomy), McIntosh recently received a 2013-14 Manitoba Health Research Council funding award. The physics and astronomy student, who's been working with medical imaging hardware for about seven years, traces his approach to these complex devices back to his Warren, Man., roots. Tinkering with computers and cars with his dad, an auto mechanic, taught him early on how to problem-solve on the fly.

"The type of troubleshooting that you do on a car is the same thought processes as troubleshooting in the lab. The real key is understanding how things are supposed to work," he says. "When developing new detector hardware and something doesn't go right, which is pretty much every day, the process of finding out what's going wrong and how to improve it is very similar to working under the hood of a car. Or trying to fix a gaming computer that's not working right."

umanitoba.ca/research

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