

U of T turns to low-cost IT to create malaria diagnosis tool

Online system captures medical microscope images for broadcast

6/6/2006 5:00:00 PM

by Neil Sutton

TORONTO – A [group of researchers](#) at the University of Toronto have developed a low-cost technology solution that could change the way Canadian physicians diagnose deadly diseases like malaria.



Most Canadians probably don't think of malaria as a common malady, but there are more cases discovered in Canada than anywhere else in the western world, said Dr. Ian Crandall.

Crandall is an assistant professor in the department of laboratory medicine and pathology at U of T. He's also on staff at Toronto General Hospital and an expert in malaria diagnosis. He spoke Tuesday at a seminar hosted by the Ontario R&E Summit in the MaRS Discovery District, a research facility in downtown Toronto.

There are 800 to 1,200 cases of malaria discovered every year in Canada, said Crandall. Two hundred of those are in the Greater Toronto Area alone. "Obviously, they're imported, but it's a huge problem here," he said.

Canadians travelling to tropical countries are at risk to contract the disease, he said. Initially, it manifests itself as a high fever and quickly goes downhill from there. "You can go from being a breadwinner to toast in three days," said Crandall.

"If someone comes back from a tropical country with a fever, the rule of thumb is it's malaria," he said, but sometimes doctors will arrive at that diagnosis only when a patient is seriously debilitated or it's already too late.

There are several simple tests that can prove or rule out malaria conclusively – like dipstick tests – but they aren't always available outside major centres like Toronto, said Crandall. For that reason, Crandall and two co-workers at the U of T's [Laboratory for Collaborative Diagnostics](#) have devised an online system that can help medical experts

in one part of the world diagnose potential malaria cases in another.

Using cheap, readily available components and open source software, West Suhanic, executive director and an IT consultant, and Peter Pennefather, a professor of pharmaceutical science and the lab's academic director, have built a prototype diagnosis tool. The equipment is basically a jury-rigged piece of hardware consisting of a PC that can capture images from any medical microscope using a TV tuner card and broadcast them over an Internet connection. A doctor in one city who isn't sure if the sample he or she is looking at is actually malaria can consult with someone like Crandall for an expert diagnosis.

Ideally, a malaria diagnosis should be reached within an hour of taking a blood sample, said Crandall. But it's often misdiagnosed or missed completely, because malaria can look like a host of other medical conditions.

The diagnosis tool is “technology that can link the invisible world of biology to the real world of experience,” added Pennefather.

The technology also had to be low-cost so it's still an affordable option for third-world countries. As such, the three followed what they soon referred to as Suhanic's Laws:

“No peripheral should cost more than \$100; no computer should cost more than \$300; and if I can't buy it on College Street (which runs past the U of T campus), I don't want it.”

Suhanic added that “we're just trying to develop all of our tools around open source” in order to keep costs down and allow anyone in the world to use it without having to worry about using proprietary technology or software licensing issues.

The solution was successfully demonstrated by the three at a conference in Calgary in April. They are now looking for funding that would help them commercialize the product and start distributing it in Canada and overseas. It has been used over the Ontario Research and Innovation Optical Network (ORION), a high-speed network available to

more than 40 post-secondary institutions in the province, but is just as effective over a cable or DSL Internet connection, said Suhanic.

Eventually, the three hope to automate the solution so that a piece of software can recognize a malaria virus as well as a qualified human being can. It is becoming increasingly difficult to find qualified people, said Crandall: some malaria diagnosis experts are reaching retirement age and few of them are being replaced due to cost constraints.

They also want to ruggedize the solution so it can operate under poor conditions or simply be pushed off the back of an aircraft into a third-world drop zone.

Suhanic is looking for funding to take the project to the next stage. He said he has been turned down by the federal and Ontario governments and much of the research to date has been funded out of pocket. So far, the three have relied on the goodwill of people at the U of T and ORION who are willing to donate time and equipment. Suhanic said he's willing to entertain any financial offer of support that could make affordable diagnostic equipment commonplace.

Ref: <http://www.itbusiness.ca/it/client/en/Home/News.asp?id=39689&cid=3>