

# Gazette

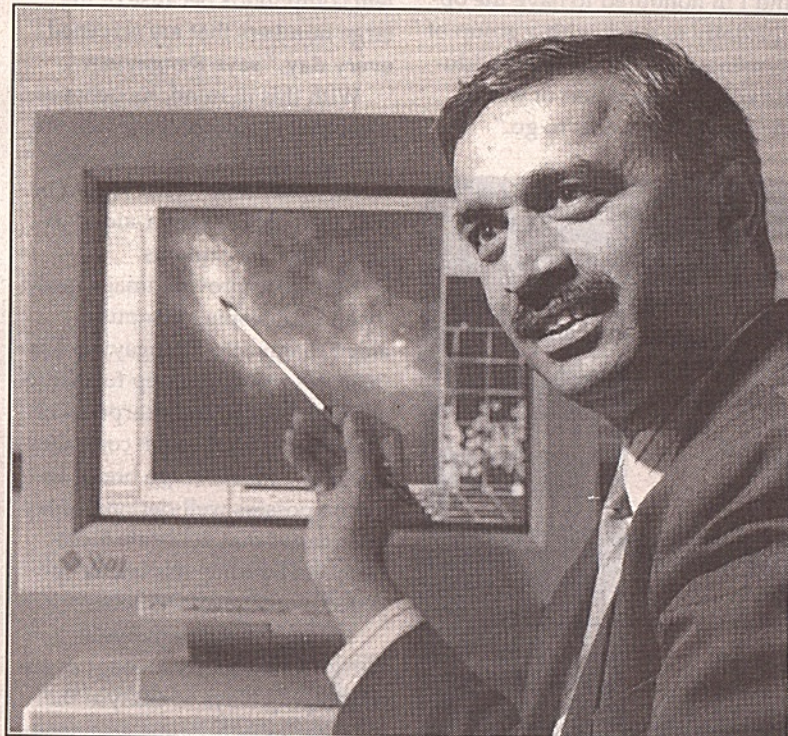
## Prof engineers better tools for breast cancer screening

U of C computer engineering professor Raj Rangayyan could soon play a major role in the fight against breast cancer through research aimed at improving diagnostic techniques.

"Mammograms are, at times, difficult to interpret," Rangayyan says. "Developing signs of cancer may be masked by superimposed tissues, making their visual detection and analysis difficult."

"We have developed computer engineering techniques for image processing designed to improve the diagnostic accuracy of mammography, and reduce the use of additional diagnostic imaging or surgical procedures," says Rangayyan, who's been working on the project for the last few years.

Detecting abnormalities in



Rangayyan: "The challenge is to catch the disease as early as possible."

mammogram pictures is difficult, he says, because breasts are mainly made up of soft tissue and, "to make things worse, the breast is compressed" during acquisition of the mammogram. "The challenge is to catch the disease as early as possible."

Under the Alberta breast cancer screening program, two radiologists are required to examine every mammogram, which can total more than 1,000 a day at some screening centres. The work requires a sharp eye every time and while radiologists do an excellent job, a few cases may be missed.

"In a screening situation, most x-ray images are normal. Radiologists have to catch one or two abnormal cases a day.... The prob-

... see *Cancer* on page 2



# Cancer screening . . .

continued from page 1

lem compounds because of the large numbers that are screened every day," says Rangayyan.

With this in mind, he believes computers could pre-scan the images and detect those that need further attention. "That would be what we call computer-aided diagnostics," he explains.

Besides improving image quality and developing computer-aided diagnostics, Rangayyan has taken his research a step further to study the shape and sharpness of breast tumours through computer imaging. "Most benign breast tumours possess well-defined, sharp boundaries that delineate them from surrounding tissues, as opposed to malignant tumours."

Using computer analysis, Rangayyan and his colleagues are developing ways to analyse the boundaries of tumours and determine if they are benign or malignant. "We're collaborating with a researcher in Brazil in developing computer techniques which will identify where boundaries (of abnormalities) are."

To put some of his research to practical use, such as designing a functional computer-aided diag-

nostic device, Rangayyan says \$150,000 is needed for equipment and another \$150,000 for operational costs. "With that \$300,000, we could have one prototype made."

Just this week, Rangayyan and his U of C team, including Leo Desautels and Sarah Rose, have been awarded a grant of \$100,000 for two years by the Alberta Heritage Foundation for Medical Research. He's waiting to hear from NSERC about an equipment grant application and plans to approach the Alberta Breast Cancer Foundation again for more research assistance.

"If we can improve the confidence in calling a case benign, we could save in biopsies and health care costs."

Breast cancer is the leading cause of death among women, with one in 10 developing the disease in their lifetime. Although curable, especially when detected at early stages, breast cancer accounts for 28 per cent of cancer cases and 20 per cent of cancer deaths in women, according to the Canadian Cancer Institute in Toronto.