A University of Canterbury (UC) student has come up with a new computerized method of reading mammograms that could help radiologists detect warning signs of breast cancer.

Haipeng Li is about to complete a Ph.D. in Software Engineering at UC after spending the last three years working on computational algorithms that can automatically read and analyze mammogram X-rays.

The algorithms he has developed, with UC Professor Ramakrishnan Mukundan and radiologist Dr. Shelley Boyd at Pacific Radiology in Christchurch as his supervisors, have been shown to accurately detect two markers linked to increased risk of breast cancer.

He hopes the research will eventually help radiologists identify cancers at an early stage when they can be treated more successfully.
overseas have accuracy rates of more than 80% so it’s a very significant achievement."

He says his aim is to provide a "secondary perspective" to support radiologists’ work and make it easier for them to interpret images, rather than computers replacing people.

"Knowing that the work I'm doing will contribute to people’s health outcomes makes it more meaningful for me. It's using artificial intelligence to help human beings and change our lives for the better."

Li, who worked as a university lecturer in China for a decade before coming to New Zealand in 2018, hopes his proposed automated algorithms will feed into computer aided detection and diagnosis (CAD) systems in the future.

He says further improvements and evaluations are needed before the tool could be used in a clinical setting.

"We’re aiming to reach 98% accuracy. Some improvements are needed in the current algorithms to extract more detailed image information for specific biomarkers and I hope to work more closely with local hospitals and radiologists to achieve even better results."

UC Computer Science and Software Engineering Professor Mukundan, who is the principal supervisor for Li’s research, says computerized approaches are increasingly being used internationally for interpretation and analysis of diagnostically relevant features in X-rays.

"Li’s research makes significant contributions to this field by performing a comprehensive texture analysis of mammographic features for microcalcification detection and breast density estimation."

Radiologist Dr. Boyd says detection of microcalcification from mammograms is a major part of breast cancer detection. Early treatment can prevent progression to invasive and more aggressive forms of the disease. It is also useful to have local research relating to breast density,