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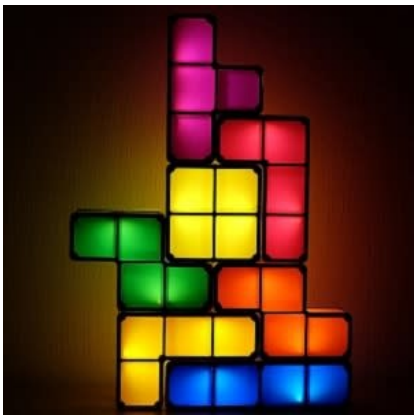
Tetris-like program can detect breast tumours faster than current methods



Artificial intelligence-based techniques are helping researchers at the University of Adelaide's Australian Institute for Machine Learning (AIML) to develop a fully-automated medical image analysis program for detecting breast tumours.

In conjunction with an MRI scan, this autonomous AI program employs the traversal movement and style of a retro video game to examine the breast area. This unique style enables the program to focus on the affected area and provide a quick diagnosis. The program was developed by University of Adelaide PhD candidate Gabriel Maicas Suso and Associate Professor Gustavo Carneiro from AIML.

"Just as vintage video game Tetris manipulated geometric shapes to fit a space, this program uses a green square to navigate and search over the breast image to locate lesions. The square changes to red in colour if a lesion is detected," Maicas Suso explains.

So far, the AIML research shows this unique approach is 1.78 times faster in finding a lesion than existing methods of detecting breast cancer, and "the results are just as accurate," Maicas Suso notes.

The researchers created this program by applying deep reinforcement learning methods, a form of artificial intelligence (AI) that enables computers and machines to learn how to do complex tasks without being programmed by humans. As a result, the program can independently analyse breast tissue.

The AIML team was able to train the computer program with a relatively small amount of data, which is a critical challenge in medical imaging.

"By incorporating machine learning into medical imaging analysis, we have developed a program that intuitively locates lesions quickly and accurately," says Associate Professor Carneiro.

"More research is needed before the program could be used clinically. Our ultimate aim is for this detection method to be used by radiologists to complement, support and assist their important work in making a precise and quick prognosis."

Source: University of Adelaide
Image Credit: Pixabay

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