ABSTRACT

Cardiomegaly or enlargement of the heart, is a designated umbrella term for various conditions that lead to the enlargement of the heart. Early detection and intervention would increase the chance of survival, however, detection of cardiomegaly is usually done with chest X-rays and might be difficult to do as diagnosis of cardiomegaly involves the detection of subtle and small changes in the heart.

Convolutional Neural Network (CNN) is a type of Artificial Intelligence (AI) specifically in computer vision that has proven itself to be able to process medical images in a fast, accurate, and highly precise manner. Integrating computer vision into the healthcare system as diagnosis assistant will have huge benefits for cardiomegaly diagnosis. Many CNN algorithm has been developed over the years, in this study we are comparing 4 popular CNN:

YOLOv5, YOLOv8, ResNet, and EfficientNet,

And their ability to detect cardiomegaly in X-ray images. We found that YOLOv8x has the best overall accuracy with an accuracy of 0.867 in detecting cardiomegaly, however, YOLOv5s has the best accuracy in detecting true negative cases with an accuracy of 0.834 in true negative cases.

Keywords: Cardiomegaly, CNN, Convolutional neural network, Artificial intelligence, Computer vision