

Title : Effects of precise cardio sounds on the success rate of phonocardiography

PLOS one , 게재연월 2024년 7월, <https://doi.org/10.1371/journal.pone.0305404>

This work investigates whether inclusion of the low-frequency components of heart sounds can increase the accuracy, sensitivity and specificity of diagnosis of cardiovascular disorders. We standardized the measurement method to minimize changes in signal characteristics. We used the Continuous Wavelet Transform to analyze changing frequency characteristics over time and to allocate frequencies appropriately between the low-frequency and audible frequency bands. We used a Convolutional Neural Network (CNN) and deep-learning (DL) for image classification, and a CNN equipped with long short-term memory to enable sequential feature extraction. The accuracy of the learning model was validated using the PhysioNet 2016 CinC dataset, then we used our collected dataset to show that incorporating low-frequency components in the dataset increased the DL model's accuracy by 2% and sensitivity by 4%. Furthermore, the LSTM layer was 0.8% more accurate than the dense layer.