

## Automatic Classification of Periodic Heart Sounds Using Convolutional Neural Network

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**Abstract :** This paper presents an automatic normal and abnormal heart sound classification model developed based on deep learning algorithm. MITHSDB heart sounds datasets obtained from the 2016 PhysioNet/Computing in Cardiology Challenge database were used in this research with the assumption that the electrocardiograms (ECG) were recorded simultaneously with the heart sounds (phonocardiogram, PCG). The PCG time series are segmented per heart beat, and each sub-segment is converted to form a square intensity matrix, and classified using convolutional neural network (CNN) models. This approach removes the need to provide classification features for the supervised machine learning algorithm. Instead, the features are determined automatically through training, from the time series provided. The result proves that the prediction model is able to provide reasonable and comparable classification accuracy despite simple implementation. This approach can be used for real-time classification of heart sounds in Internet of Medical Things (IoMT), e.g. remote monitoring applications of PCG signal.

**Keywords :** convolutional neural network, discrete wavelet transform, deep learning, heart sound classification

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