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IMPROVING ACCURACY THROUGH COLORMAP MODIFICATION IN ANALYZING ELECTROCARDIOGRAM SIGNALS WITH COMBINATION OF WAVELET TECHNIQUES AND DEEP LEARNING NETWORKS

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Abstract. Color stands as one of the primary critical variables of visual information. Selecting the best possible colormap relies on both the specific analytical objective and the careful consideration of suitable 2D color schemes. Colormap was employed to classify electrocardiogram signals using images generated from Continuous Wavelet Transform. The findings from previous research suggest that the selection of a colormap affects the accuracy of electrocardiogram classification. The issue lies in determining the most suitable colormap to attain highest level of accuracy. This research examines the importance of colormap in creating scalograms to enhance classification accuracy using Continuous Wavelet Transform and selects deep learning networks for electrocardiogram signals representing Arrhythmia, Congestive Heart Failure, and Normal Sinus Rhythm. The simulation results demonstrate that by modifying the colormap can lead to varying optimization, ranging from 59.375% to 96.875%. Additionally, when we create transitioning from a monochromatic white to two-color progression colormap schemes, such as those represented in the RGB color cube diagram, there was a notable increase in accuracy. The costumed colormap, namely myw2m(128) pixels, remarkably boosts the accuracy from 59.375% to a perfect 100%. Keywords: Neural network, Classification, AlexNet, RGB color cube, Heartbeat