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Thème

Decision Support Systems for Cardio Vascular Disease using Deep Learning Techniques

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Abstract

On this graduation project, we investigate the use of DSS for cardiovascular diseases diagnostic, focusing on multiple types of arrhythmia. we also explore the use of LSTM as a classification model using longer term ECG signal (10 s), as well as building a platform to display and acquire new signals using IoT device (MySignals).

The use of LSTM proves to be performing very well on the task of classifying 17 categories of rhythm (15 arrhythmia + normal sinus rhythm + pacemaker rhythm) compared to other state-of-the-art methods, yielding an accuracy of 93%, sensitivity 95%, and a specificity of 99.46%. As well as a real-time responsive platform allowing the visualization of newly obtained signals and output of the computer-aided diagnostic.

This project depicts that the topic of study still faces many obstacles, challenges and limitations such as (clinical implication, healthy data ...etc) and others. Despite all the later, the LSTM and deep learning mechanisms demonstrated that it is capable of recognizing long-term patterns within our time-series data along with generalizing the diagnostic process.

Keywords: LSTM, Deep learning, arrhythmia, DSS, visualization platform, IoT, time-series.