Classification of arrhythmia by using deep learning with 2D ECG spectral image representation

INTODUCTION:

In clinical practice, it is essential to accurately detect Atrial fibrillation (AF), which is one of the potential risks of a stroke. A 12-lead Electrocardiogram (ECG), which records 10-s ECG signals from limb and chest leads, is usually adopted to screen for AF in the field of cardiology. AF presents a completely irregular RR interval and no P wave, as well as repeated P-wave-like fibrilla_tory waves, which might be observed in the limb or chest, leads on an ECG. AF detection using an ECG usually interferes with a premature Ventricular Contraction (PVC) and a Premature Atrial contraction (PAC), which present irregular RR intervals, and the premature beat originates from the ventricle or atria but sinus node [1,2].

[1].LITERATURE REVIEW:

1.It is still a challenge to develop an electrocardiography (ECG) interpreter based on ECG basic characteristics because of the uncertainty of ECG delineation.

2.An ECG interpretation gap exists between ECG devices and cardiologists.

3. This study first adopted a deep learning model to delineate ECG features such as P, QRS, and T waves based on 1160 8–10-s lead I or lead II ECG signals from a clinically-used 12-lead ECG device whose ECG device interpretation is AF as a training dataset.

ADVANTAGES:

1. ECG data digitalization, acquisition, and heterogeneous data formats are still impeded by ECG device manufacture.

2.which requires fewer ECG samples and is independent of specific ECGs.

DISADVANTAGES:

1. In addition, the Proposed model and algorithms can be easily applied to other ECGs' interpretations of rare-seen ECG cases.

2. We believe that this study can facilitate artificial intelligence-based applications on ECG interpretation in clinical practice and bridge the gaps between the research and clinical practice.

.

[2].LITERATURE REVIEW:

1.Arrhythmias are defined as irregularities in the heartbeat rhythm, which may infrequently occur in a

human's life.

2.First, 1D ECG signals are translated into 2D Scalogram images to automate the noise filtering and feature extraction.

3.. For future work, the proposed method can be applied over some live ECG signals and Bi-LSTM can be applied instead of LSTM.

ADVANTAGES:

1.Arrhythmia classification is the most crucial subject in healthcare.

2. An arrhythmia is a rhythm or heart rate irregularity.

DISADVANTAGES:

1.The heavy computing burden caused by the use of CWT is a drawback. We could never achieve a complete inter-subject state, even though doing so will signif_icantly minimise the amount of intervention required by doctors.

2. It will be an excellent Future avenue for researchers. A robust arrhythmia classification algorithm is needed to Address these issues.

REFERENCES:

[1]. A clinical study on Atrial Fibrillation, Premature Ventricular Contraction, and Premature Atrial Contraction screening based on an ECG deep learning model

AUTHOR NAME:Jianyuan Hong a,b, Hua-Jung Li a , Chung-chi Yang c, Chih-Lu Han d, Jui-chien Hsieha

[2].Two-dimensional ECG-based cardiac arrhythmia classifcation using DSE-ResNet
AUTHOR: Jiahao Li , Shao-peng Pang, Fangzhou Xu, Peng Ji, Shuwang Zhou, & Minglei Shu