CLASSIFICATION OF ARRHYTHMIA BY USING DEEP LEARNING WITH 2-D ECG SPECTRAL IMAGE REPRESENTATION

List of problem statements:

1.Clinical experts might need to look at ECG recordings over a longer period of time for detecting cardiac arrhythmia. The ECG is a one-dimensional (1-D) signal representing a time series, which can be analyzed using machine learning techniques for automated detection of certain abnormalities.

2.Doctors are frequently required to evaluate and diagnose cardiac problems using single-lead or multiple-lead ECG readings in clinical applications. However, an efficient and low-complexity automatic CVD identification model is required due to the heavy burden associated with a clinical diagnosis and the disparity in doctors' expertise levels.

3.The manifestations of cardiac disease are often complex and varied. As a result, more types of ECG data will need to be added due to this time taken for testing, training and validation will also be increased.

4.The description of the patient population in which these ECGs were obtained is lacking.It is important in interpreting the methodology and clinical utility in context.

5.The researcher puts lots of effort into developing the automated system with good accuracy results. The developed system may act as clinical support for the healthcare professionals but with few limitations.

6.The automated arrhythmia detection requires the feature extraction of ECG images that require domain knowledge. Further, a balanced dataset used for classification methods is required to avoid overfitting.

7.ECG's time-series data with signal leads are not appropriate for stable baseline wanders, muscle contraction, and power line interface.

8. Designing and adjusting CNN models, the high computational cost of neural networks is the most significant drawback.

9. With a larger database of heart defects at different stages will make the analysis more full proof. To come up with still simpler methods for ECG signal Analysis , a lot of research needs to be done on the properties.

10. ECG signal properties (such as period, and amplitude) vary from person to person and depend on different factors such as age, gender, physical conditions, and lifestyle. Finding a generalized framework along with the related standards to be functional for the general population is problematic.

11. Morphology of ECG signal is often not stationary even for one testing person because of physical states such as running, walking, and sleeping.