LITERATURE SURVEY

S.No	Title/Journal/Publisher	Author	Methodology	Result
1.	Classification of cardiac arrhythmia using a convolutional neural network and bi-directional long short-term memory. DigitHealth(2022), NCBI	Hassan SU, Mohd Zahid MS, Abdullah TA, Husain K.	❖ CNN and bi-directional LSTM is used to analyse ECGs to detect 5 types of heartbeats-non-ectopic (N), supraventricular ectopic (S), ventricular ectopic (V), fusion (F), and unknown (Q) beats.	The proposed model achieved an accuracy of around 98%.
2.	Deep Network for Arrhythmia Classification (2020). Remote Sensing. 12. 1685. 10.3390/r	Ullah, Amin & Anwar, Syed & Bilal, Muhammad & Mehmood, Raja Majid.	❖ Three Deep Neural Network architectures to perform feature extraction and classify ECG signals. The first network is a Convolutional Neural Network, the second network is a Long Short Term Memory(LSTM) Network and the third is a combination of CNN and LSTM feature extractor, CLSTM network.	❖ The networks were trained and tested with the MITDB ECG dataset on three classes Normal (N), Premature Ventricular Contraction (PVC) and Premature Atrial Contraction (PAC). The CLSTM model gave an accuracy of 97.6%
3.	Comparing feature-based classifiers and convolutional neural networks to detect arrhythmia from short segments of ECG, 2018 IEEE Symposium on MeMeA	F. Andreotti, O. Carr, M. A. F. Pimentel, A. Mahdi and M. De Vos	❖ A CNN-based approach was used to detect and classify Arrhythmia.	❖ The feature-based classifier obtained an F_1 score of 72.0% on the training set (5-fold cross-validation), and 79% on the hidden test set. Similarly, the convolutional neural network scored 72.1%

				on the augmented database and 83% on the test set. ❖ The latter method resulted on a final score of 79% at the competition.
4.	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation Remote Sense (2020)	Ullah, Amin & Anwar, Syed & Bilal, Muhammad & Mehmood, Raja Majid.	❖ A two-dimensional (2-D) convolutional neural network (CNN) model for the classification of ECG signals into eight classes proposed. ❖ The one-dimensional ECG time series signals are transformed into 2-D spectrograms through a short-time Fourier transform. ❖ The 2-D CNN model consisting of four convolutional layers and four pooling layers is designed for extracting robust features from the input spectrograms.	The proposed methodology is evaluated on a publicly available MIT-BIH arrhythmia dataset and achieved a state-of-the-art average classification accuracy of 99.11%.
5.	Classification of Arrhythmia in Heartbeat Detection Using Deep Learning Comput Intell Neurosci. 2021 Oct 19 PubMed Central	Wusat Ullah, **Imran Siddique**, Rana Muhammad Zulqarnain, Mohammad Mahtab Alam, Irfan Ahmad, and Usman Ahmad Raza	❖ This paper applies deep learning techniques on the publicly available dataset to classify arrhythmia. One dataset is the MIT-BIH arrhythmia database, with a sampling frequency of 125 Hz with 1,09,446 ECG beats. The classes included in this first dataset are N, S, V, F, and Q. ❖ The second database is PTB Diagnostic ECG Database. The second database has two classes. The techniques used in these two datasets are the	The result achieved by using these three techniques shows the accuracy of 99.12% for the CNN model, 99.3% for CNN + LSTM, and 99.29% for CNN + LSTM + Attention Model.

			CNN model, CNN + LSTM, and CNN + LSTM + Attention Model. 80% of the data is used for the training, and the remaining 20% is used for testing.	