

Project Design Phase-I
Proposed Solution Template

Date	24/09/2022
Team ID	PNT2022TMID52880
Project Name	Classification Of Arrhythmia By Using Deep Learning

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Classification of different types of Arrhythmia using deep learning and feature selection methods.
2.	Idea / Solution description	Arrhythmia is a problem with the rate or rhythm of the heartbeat. There are different types of arrhythmia, and it is usually identified by experts through ECG signals. This manual intervention takes quite some time and experience on the physician's side to understand the intricate patterns of the signal and classify it properly to provide appropriate treatment. In this project, we try to reduce the burden of the physician and build a CNN based deep learning model which takes the ECG reports as the input. The ECG signal is pre-processed and mathematical operations like Discrete Fourier Transform and Wavelet transform to obtain features. These features are then converted to spectrograms/images using short time Fourier transform and converted to spectral images. These images are then fed to a CNN to classify different types of arrhythmic conditions.
3.	Novelty / Uniqueness	CNN's are the most commonly ones used, usually a CNN written by the researchers working on it. We plan to implement transfer learning and convert the ECG signals into spectrograms using Fourier transform/wavelet transforms.
4.	Social Impact / Customer Satisfaction	This when implemented in real time reduces the number of false detections, improves the efficiency and more importantly helps the medical society in various ways.
5.	Business Model (Revenue Model)	When developed as an application, this model can be used from any location and can be given as a paid subscription to the users.

6.	Scalability of the Solution	Using different types of feature selection methodologies, we can observe various efficiency levels of those methods. This model can be implemented in a web interface/ web application mode, which various clinicians can access to classify the data as well as try to get more insights from the same.
----	-----------------------------	--