Project Design Phase 1

Proposed Solution

Date	30 September 2022
Team ID	PNT2022TMID35734
Project Name	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation
Maximum Marks	2 Marks

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	1. Based on the heart rate, bradycardia, tachycardia are the two broad categories for arrhythmia. 2. They are further split into groups based on where they come from, how they are transmitted, and any accompanying disorders. 3. Arrhythmias can be paroxysmal, making it challenging to determine their actual occurrence. 4. An accurate classification of these types could help in diagnosing and treatment of heart disease patients.
2	Idea / Solution Description	1. The automatic classification of arrhythmia using the ECG signal in a supervised way is proposed using a CNN-based model. 2. The type of arrhythmia present is identified by appropriate labelling on the ECG data utilised in the study.1 3. Expert cardiologists assigned these designations, which are then used for supervised training.

		4. The arrhythmia class label was applied to the associated spectrogram picture representation for each heartbeat segment.
3	Novelty / Uniqueness	Comparative analysis of various CNN models like ResNet, Xception, VGG19 and a custom model will be performed before deploying the model with the best performance in the web application.
4	Social Impact / Customer Satisfaction	It is extremely difficult to predict abnormal heart rates interactively. As a result, an automated system capable of identifying discrete abnormal heartbeats from a large amount of ECG data will promote safe and independent living among the public which will made them more self-reliable.
5	Business Model (Revenue Model)	Provide an affordable web application to classify arrhythmia from an ECG image, accessed by the public and medical professionals. It could be converted to a mobile application, integrating with devices like smart watch.
6	Scalability of the Solution	The proposed web application is scalable. It can be expanded to classify multiple images at once in the future. It aims to increase cost effectiveness of diagnosis of ECG data, attaining a higher performance.