**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 18 October 2022 |
| Team ID | PNT2022TMID36166 |
| Project Name | Classification Of Arrhythmia By Using Deep Learning With 2-D ECG Spectral Image Representation |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | Registration through Form  Registration through G mail  Registration through Linked IN |
| FR-2 | User Confirmation | Confirmation via Email  Confirmation via OTP |
| FR-3 | Functional requirements | The requirements for our projects are Deep learning,CNN(convolution neural network),ECG spectral image representation |
| FR-4 | Proposed solution. | The method consists of 5steps, signal pre-processing generation of 2-D image (spectrograms), augmentation of data, extraction of features from the data (using the CNN model) and its classification based on the extracted features. |
| FR-5 | Dataset | Twenty-five  recordings were chosen from a similar set, with a focus on complex ventricular, junction, and  Supra-ventricular arrhythmia's. These recordings were digitized at 360 samples/sec for each channel  with a resolution of 11-bits over a range of 10 mV. |
| FR-6 | Experimental Setup | The experimental setup consisted of an  eighth-generation ASUS server with 32GB internal RAM, 500 GB external SSD hard drive with the  Addition of internal hard drive, and NVIDIA 1080 GPU with 11 GB memory. The 2-D spectral images  Were divided such that 70% of the data was used for training, 30% for test. |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | Classification Of Arrhythmia By Using Deep Learning With 2-D ECG Spectral Image Representation our usability is 6.88 |
| NFR-2 | **Security** | Concerning the security and privacy of the ECG monitoring system, we adopted a PRG  -based stream cipher to protect the ECG signal, and we conceal the identity of the user from the DSS using a pseudonym system. To verify that our system is secure, we verify that our scheme satisfies the security objectives. |
| NFR-3 | **Reliability** | Automated arrhythmia detection systems are sensitive in acute stroke. |
| NFR-4 | **Performance** | Performance Analysis for Arrhythmia Classification using PSO, GWO and SVM. Abstract: Proper heart rate or heart rhythm leads to healthy lifestyle. |
| NFR-5 | **Availability** | When the electrical signals that coordinate the heart's beats don't work properly. |
| NFR-6 | **Scalability** | The ECG waveform scaling properties thus suggest that reduced complexity dominates the underlying mechanisms of arrhythmia. |