Model Development Phase Template

Date	24 SEPTEMBER 2024
Team ID	SWTID1727151090
Project Title	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation
Maximum Marks	5 Marks

Model Selection Report

In the model selection report for future deep learning and computer vision projects, various architectures, such as CNNs or RNNs, will be evaluated. Factors such as performance, complexity, and computational requirements will be considered to determine the most suitable model for the task at hand.

Model Selection Report:

Model	Description
CNN	1. **Performance** The primary objective is to achieve high classification accuracy and reliable detection of arrhythmias. Metrics such as sensitivity, specificity, precision, recall, F1-score, and overall accuracy will be evaluated. Robustness to variations in input ECG data across patients is crucial, along with the ability to generalize across diverse datasets. Transfer learning may also be explored, utilizing pre-trained CNN models fine-tuned for this application. 2. **Complexity** The complexity of the model impacts its deployability in real-world healthcare systems. Model depth and the number of layers will be carefully balanced to avoid overfitting while ensuring sufficient

representational power for complex spectral patterns. Parameter count will also be considered to optimize model size and reduce training and inference overhead.

3. **Computational Requirements**
   The computational demands of the CNN models will be evaluated, including:

- Training time and resource consumption on standard hardware.

- Inference speed, especially for real-time monitoring or bedside diagnostics.

- Compatibility with deployment environments, including cloud platforms and edge devices in portable health monitoring systems.