Sprint-1

Dataset Collection & Image Preprocessing

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Project Name	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation

Tasks

This project contains the following tasks:

1. Collecting the datasets.
2. Image Preprocessing.

Dataset Collection:

The dataset collection containing six classes:

1. Left Bundle Branch Block.
2. Normal.
3. Premature Atrial Contraction.
4. Premature Ventricular Contractions.
5. Right Bundle Branch Block.
6. Ventricular Fibrillation.

Image Preprocessing:

Image Pre-processing of the project includes the following main tasks:

1. We have to Import Image Data Generator Library.
2. Configure Image Data Generator Class.
3. Apply Image Data Generator functionality to the train set and test set.

Import Image Data Generator Library:

Introduction to Keras Image Data Generator. Keras Image Data Generator is used for getting the input of the original data and further, it makes the transformation of this data on a random basis and gives the output resultant containing only the data that is newly transformed. It does not add the data.

Import The Image data Generator

```
[ ] from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

Configure Image Data Generator Class:

There are five main types of data augmentation techniques for image data, specifically:

1. Shifts via the width_shift_range and height_shift_range arguments.
2. Flips via the horizontal_flip and vertical_flip arguments.
3. Rotates via the rotation_range argument.
4. Brightness via the brightness_range argument.
5. Zoom via the zoom_range argument.

Configure Image Data Generator Class

```
[ ] train_datagen = ImageDataGenerator(rescale = 1./255,shear_range = 0.2,zoom_range = 0.2,horizontal_flip = True)
    test_datagen = ImageDataGenerator(rescale = 1./255)
```

The Image Data Generator class's instance can be constructed for train and test.

Apply Image Data Generator functionality to the train set and test set:

We can apply Image Data Generator functionality to Train set and Test set by usingthe following code.

This will return batches of images from the subdirectories Left Bundle Branch Block, Normal, Premature Atrial Contraction, Premature Ventricular Contractions, Right Bundle Branch Block and Ventricular Fibrillation, together with labels 0 to 5

{'Left Bundle Branch Block': 0, 'Normal': 1, 'Premature Atrial Contraction': 2, 'Premature Ventricular Contractions': 3, 'Right Bundle Branch Block': 4, 'Ventricular Fibrillation': 5}

We can see that for training there are 15341 images belonging to 6 classes and for testing there are 6825 images belonging to 6 classes.