**PROJECT TITLE**

**Agri-Tech: Building a machine learning model for accelerometer data obtained from sheep activity**

1. Train Python file:

Functions

* add\_feature(data):

This function can be used to add more features for the data. So far four features have been added which are Magnitude\_vector, relation between Axis1 and Axis2, relation between Axis2 and Axis3, relation between Axis1 and Axis3.

It has only one input parameter which is the whole raw data.

* seperating\_features(data,activity,roll\_size):

This function can be used to separate each features as series based upon each activity and to roll them with a preferred window size.

It has three parameters which are the data obtained from add\_feature() function, the activity type and the window size.

* roll\_ts(series,window)

This function is used to roll the data series with preferred window size.

* concat(Idle,Walk,grazing,licking,rumination):

This function is used for concatenating the rolling results obtained from separating feature() function. The four input parameters are the rolled data of each activity of same feature.

* Convolution\_Model(time\_steps,features):

This function is used for designing the Convolutional Neural Network required for the activity recognition. The input parameters are the time steps and the no of feature which is the input shape.

1. Test Python file:

* add\_feature(data):

This function can be used to add more features for the data. So far four features have been added which are Magnitude\_vector, relation between Axis1 and Axis2, relation between Axis2 and Axis3, relation between Axis1 and Axis3.

It has only one input parameter which is the whole raw data.

* def test\_preprocess(time\_steps,step):

This function is used to pre-process the test data in a way which the CNN model receive. The two input parameters time\_steps and step both denotes the frequency of the data. For example: In the Sheep project the data is recorded with the frequency of 30Hz. So the value of time\_steps and step will be 30.

* show\_confusion\_matrix(validations, predictions ,LABELS):

This function is for plotting the confusion matrix after testing the data with the model.The input parameter validation is the actual class label, predictions is the class label predicted by the model and the LABELS is the equivalent categorical value of each numerical label value.