*REPORT:*

Human activity recognition *with smart phone:*

*Now the world will run across the world in the busy schedule.In the way of life leading the man will not have any time for take care about their lifes.Now the world is running towards the technology and the human beings are very busy in their works.Thats why I choose this project for my work.And I create a dataset about the humans pulse data and by thatv data I will calculate the human health and I will show their physical fitness at that situation.By this idea the human beings are will take care about their lifes.thats the motive behind this project.*

*The dataset containing the different activities with a smartphone to the waists of 30 persons. The data is recorded with the help of sensors (accelerometer and Gyroscope) in that smartphone.*

*Importing dataset using pandas library:*

*The dataset contain the columns 'tBodyAcc-mean()-X', 'tBodyAcc-mean()-Y', 'tBodyAcc-mean()-Z',*

*'tBodyAcc-std()-X', 'tBodyAcc-std()-Y', 'tBodyAcc-std()-Z',*

*'tBodyAcc-mad()-X', 'tBodyAcc-mad()-Y', 'tBodyAcc-mad()-Z',*

*'tBodyAcc-max()-X',*

*...*

*'fBodyBodyGyroJerkMag-kurtosis()', 'angle(tBodyAccMean,gravity)',*

*'angle(tBodyAccJerkMean),gravityMean)',*

*'angle(tBodyGyroMean,gravityMean)',*

*'angle(tBodyGyroJerkMean,gravityMean)', 'angle(X,gravityMean)',*

*'angle(Y,gravityMean)', 'angle(Z,gravityMean)', 'subject', 'Activity'],*

*dtype='object', length=563)*

* *The data is recorded By using the sensors(Gyroscope and accelerometer) in a smartphone, they have captured '3-axial linear acceleration'(*tAcc-XYZ*) from accelerometer and '3-axial angular velocity' (*tGyro-XYZ*) from Gyroscope with several variations.*

*Data preprocessing:*

* *perform the cleaning and processing on the dataset.*
* *Data preprocessing is performed on the dataset.*

*Splitting the dataset:*

* *The readings from 70% of the volunteers were taken as trianing data and remaining 30% subjects recordings were taken for test data*
* 6 Activities:

1. Walking
2. WalkingUpstairs
3. WalkingDownstairs
4. Standing
5. Sitting
6. Lying.

* we will remove the commas and brackets to out features so that we can apply directly.
* save our data to csv file for future prediction .

Analysis:

* For the prediction there are 2 types of activities:
* Static and dynamic ,
* Static activity: The Static activity does not depend on motion information . those are:standing, sit, liedown
* Dynamic activity: The dynamic activities depends on motion information, those are: Walking, WalkingUpstairs,WalkingDownstairs.
* Ploting dist plot graph for the stationary and moving activities.
* Plot boxplot for the activities and Acceleration magnitude mean. prefix t means time.
* If tAccMean is < -0.8 then the Activities are either Standing or Sitting or Laying.
* If tAccMean is > -0.6 then the Activities are either Walking or WalkingDownstairs or WalkingUpstairs.
* If tAccMean > 0.0 then the Activity is WalkingDownstairs.
* We can classify 75% the Acitivity labels with some errors.
* Plot boxplot for the angleXgravityMean and the activity.
* In this angleXgravityMean of the lying activity is > 0 and for the other activities angleXgravityMean<0.

Required modules:

* import itertools
* import numpy as np
* import matplotlib.pyplot as plt
* from sklearn.metrics import confusion\_matrix
* %matplotlib inline
* from IPython.display import Markdown, display
* from datetime import datetime
* for Logistic Regression:(modules need to import):
* from sklearn import linear\_model
* from sklearn import metrics
* from sklearn.model\_selection import GridSearchCV

Train the dataset:

* fit the model with x\_train and y\_train.

Test the data set(predict human activity):

* And test with the x\_test.

Conclusion:

* The model predicting the Human activity recognition with smart phone.