The data set “avg_measure_per_activity_per_subject.txt” includes the following columns:

1. Activity_lable
2. subject

Columns 3-50 are one column per feature above – which is the average value for the specific activity and specific subject. The activities are:

3. tBodyAcc_mean_X
4. tBodyAcc_mean_Y
5. tBodyAcc_mean_Z
6. tBodyAcc_std_X
7. tBodyAcc_std_Y
8. tBodyAcc_std_Z
9. tGravityAcc_mean_X
10. tGravityAcc_mean_Y
11. tGravityAcc_mean_Z
12. tGravityAcc_std_X
13. tGravityAcc_std_Y
14. tGravityAcc_std_Z
15. tBodyAccJerk_mean_X
16. tBodyAccJerk_mean_Y
17. tBodyAccJerk_mean_Z
18. tBodyAccJerk_std_X
19. tBodyAccJerk_std_Y
20. tBodyAccJerk_std_Z
21. tBodyGyro_mean_X
22. tBodyGyro_mean_Y
23. tBodyGyro_mean_Z
24. tBodyGyro_std_X
25. tBodyGyro_std_Y
26. tBodyGyro_std_Z
27. tBodyGyroJerk_mean_X
28. tBodyGyroJerk_mean_Y
29. tBodyGyroJerk_mean_Z
30. tBodyGyroJerk_std_X
31. tBodyGyroJerk_std_Y
32. tBodyGyroJerk_std_Z
33. tBodyAccMag_mean
34. tBodyAccMag_std
35. tGravityAccMag_mean
36. tGravityAccMag_std
37. tBodyAccJerkMag_mean
38. tBodyAccJerkMag_std
39. tBodyGyroMag_mean
40. tBodyGyroMag_std
41. tBodyGyroJerkMag_mean
42. tBodyGyroJerkMag_std
43. fBodyAcc_mean_X
44. fBodyAcc_mean_Y

45. fBodyAcc_mean_Z
46. fBodyAcc_std_X
47. fBodyAcc_std_Y
48. fBodyAcc_std_Z
49. fBodyAcc_meanFreq_X
50. fBodyAcc_meanFreq_Y

The bellow is an explanation on the data base features used to calculate the above:

The features selected for this database come from the accelerometer and gyroscope 3-axial raw signals tAcc-XYZ and tGyro-XYZ. These time domain signals (prefix 't' to denote time) were captured at a constant rate of 50 Hz. Then they were filtered using a median filter and a 3rd order low pass Butterworth filter with a corner frequency of 20 Hz to remove noise. Similarly, the acceleration signal was then separated into body and gravity acceleration signals (tBodyAcc-XYZ and tGravityAcc-XYZ) using another low pass Butterworth filter with a corner frequency of 0.3 Hz.

Subsequently, the body linear acceleration and angular velocity were derived in time to obtain Jerk signals (tBodyAccJerk-XYZ and tBodyGyroJerk-XYZ). Also the magnitude of these three-dimensional signals were calculated using the Euclidean norm (tBodyAccMag, tGravityAccMag, tBodyAccJerkMag, tBodyGyroMag, tBodyGyroJerkMag).

Finally a Fast Fourier Transform (FFT) was applied to some of these signals producing fBodyAcc-XYZ, fBodyAccJerk-XYZ, fBodyGyro-XYZ, fBodyAccJerkMag, fBodyGyroMag, fBodyGyroJerkMag. (Note the 'f' to indicate frequency domain signals).

These signals were used to estimate variables of the feature vector for each pattern:

'-XYZ' is used to denote 3-axial signals in the X, Y and Z directions.

tBodyAcc-XYZ

tGravityAcc-XYZ

tBodyAccJerk-XYZ

tBodyGyro-XYZ

tBodyGyroJerk-XYZ

tBodyAccMag

tGravityAccMag

tBodyAccJerkMag

tBodyGyroMag

tBodyGyroJerkMag

fBodyAcc-XYZ

fBodyAccJerk-XYZ

fBodyGyro-XYZ

fBodyAccMag

fBodyAccJerkMag

fBodyGyroMag

fBodyGyroJerkMag

The set of variables that were estimated from these signals are:

mean(): Mean value

std(): Standard deviation

Additional vectors obtained by averaging the signals in a signal window sample. These are used on the angle() variable:

gravityMean

tBodyAccMean

tBodyAccJerkMean

tBodyGyroMean

tBodyGyroJerkMean