1a. Store current y-vector to a previous y-vector container

1b.Get the current accelerometer inputs

2.Calculate the magnitude of the accelerations (x,y,z) axis

3.Get the percentage error the current value and previous value.

4b if the error is greater than or equal 1.5 % the magnitude of the current values become previous value ( because there is no consistency), so it will go to dynamic function

Dynamic Function:

4b1. Calculate the difference of the previous angle of the y-vector to the current angle of the y-vector

4b2. Check value if the magnitude error is greater than the gravity magnitude ( it means there is greater force than the gravity is acting on the user)

4b3. If yes, check if the user if in lying state, and it will also check what kind of fall the user felt

( backward, sideward,forward)

4b4. If no, check if the difference angle is in the walking angle range, and it should check also the specific acceleration for walking, if all the parameters is satisfied it will input walking.

4a. else the current and previous value will be averaged, and this will be the new previous value because the error is very minimal, so it will go to static function.

Static Function:

4a1. it checks if the user is standing if yes it will output standing.

4a2. if not, checks the user if in the sitting position, if yes it will output sitting

4a3. if not, checks the user if in lying position, if yes it will output lying position

Get the current accelerometer inputs

NO

YES

S

D

Store current y-vector to a previous y-vector container

Calculate the magnitude of the accelerations (x,y,z) axis

Get the percentage error of the current value and previous value.

Check error if greater than 1.5%

S

D

current and previous value will be averaged, and this will be the new previous value

current values become previous value

Static Function

Dynamic Function

Standing?

Sitting?

Lying?

NO

NO

NO

YES

YES

Output:

Standing

Output:

Unknown

W

F

NO

YES

Check error if greater than 15%

Calculate the difference of the previous angle of the y-vector to the current angle of the y-vector

Output:

Lying

Output:

Sitting

YES

F

W

NO

Is the user in lying state?

Output:

Unknown

YES

Output:

Forward, Backward, or Sideward Fall

Is the difference angle is in walking angle range?

Output:

Walking

Output:

Unknown

NO

YES