CLAIMS

WHAT IS CLAIMED IS:

1. A method for heart rate estimation, the method comprising the steps of:

estimating heart rate data of a user, wherein the estimated heart rate data is distributed among a first window and a second window of a plurality of time windows in the order the heart rate data is estimated and based on corresponding timestamp matching the estimated heart rate data;

collecting data pertaining to a first mobility state and a second mobility state of the user, while estimating the heart rate data; and

processing the estimated heart rate data and the data pertaining to the first mobility state and the second mobility state, comprising:

identifying a transition state of the user between the first window and the second window as one of a first transition state, a second transition state, or a third transition state, in terms of transition between the first mobility state and the second mobility state while estimating the heart rate data;

filtering the estimated heart rate data based on the identified transition state of the user based on a first reference value, a second reference value or a third reference value, wherein the first reference value equals summation of a heart rate value in the first window and 'interval', the second reference value equals summation of a heart rate value in the second window and the 'interval' and the third reference value equals difference between the heart rate value in the second window and the 'interval', wherein the 'interval' is a heart rate change tolerance interval, and wherein filtering the estimated heart rate data if the identified transition state is the first transition state representing transition of the user from the first mobility state to the second mobility state between the first window and the second window of the plurality of time windows, by executing a first method, comprises:

checking whether the heart rate value in the second window of the plurality of time windows lies between the heart rate value in the first window and the first reference value;

if the heart rate value in the second window lies between the heart rate value in the first window and the first reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the heart rate value in the first window and the first reference value:

generating the filtered heart rate data as equal to summation of the heart rate value in the first window and a second incremental value; and

generating a filtered heart rate data as output.

2. The method as claimed in claim 1, wherein the first mobility state is a state of rest and the second mobility state is a state of motion.

3. The method as claimed in claim 1, wherein the second transition state represents the user continuing in the first mobility state between the first window and the second window of the plurality of time windows, wherein filtering the heart rate data if the identified transition state is the second transition state, by executing a second method, comprises:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by a value equal to a third incremental value.

4. The method as claimed in claim 1, wherein the third transition state represents transition of the user from the second mobility state to the first mobility state or the user continuing in the second mobility state, between the first window and the second window of the plurality of time windows, wherein filtering the heart rate data if the identified transition state is the third transition state, by executing a third method, comprises:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by the first incremental value.

5. A system (100) for heart rate estimation comprising:

a memory module (102) storing a plurality of instructions;

one or more communication interfaces (110); and

one or more hardware processors (104) coupled to the memory module (102) via the one or more communication interfaces (110), wherein the one or more hardware processors are caused by the plurality of instructions to:

estimate heart rate data of a user, via the heart rate estimation module (106), wherein the estimated heart rate data is distributed among a first window and a second window of a plurality of time windows in the order the heart rate data is

estimated and based on corresponding timestamp matching the estimated heart rate data;

collect data pertaining to a first mobility state and a second mobility state of the user, while estimating the heart rate data; and

process the estimated heart rate data and the data pertaining to the first mobility state and the second mobility state, comprising:

identifying a transition state of the user between the first window and the second window as one of a first transition state, a second transition state, or a third transition state, in terms of a transition between the first mobility state and the second mobility state while estimating the heart rate data;

filtering the estimated heart rate data based on the identified transition state of the user based on a first reference value, a second reference value or a third reference value, wherein the first reference value equals summation of a heart rate value in the first window and 'interval', the second reference value equals summation of a heart rate value in the second window and the 'interval' and the third reference value equals difference between the heart rate value in the second window and the 'interval', wherein the 'interval' is a heart rate change tolerance interval, via the post processing module (108), and wherein filtering the estimated heart rate data if the identified transition state is the first transition state representing transition of the user from the first mobility state to the second mobility state between the first window and the second window of the plurality of time windows, by executing a first method, comprises:

checking whether the heart rate value in the second window of the plurality of time windows lies between the heart rate value in the first window and the first reference value;

if the heart rate value in the second window lies between the heart rate value in the first window and the first reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the heart rate value in the first window and the first reference value:

generating the filtered heart rate data as equal to summation of the heart rate value in the first window and a second incremental value; and

generating a filtered heart rate data as output.

6. The system as claimed in claim 5, wherein the first mobility state is a state of rest and the second mobility state is a state of motion.

7. The system as claimed in claim 5, wherein the second transition state represents the user continuing in the first mobility state between the first window and the second window of the plurality of time windows, wherein the system filters the heart rate data by executing a second method, if the identified transition state is the second transition state, by:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window;

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by a value equal to a third incremental value.

8. The system as claimed in claim 5, wherein the third transition state represents transition of the user from the second mobility state to the first mobility state or the user continuing in the second mobility state, between the first window and the second

window of the plurality of time windows, wherein the system filters the heart rate data by executing a third method, if the identified transition state is the third transition state, by:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by the first incremental value.

9. One or more non-transitory machine readable information storage mediums comprising one or more instructions which when executed by one or more hardware processors cause:

estimating heart rate data of a user, wherein the estimated heart rate data is distributed among a first window and a second window of a plurality of time windows in the order the heart rate data is estimated and based on corresponding timestamp matching the estimated heart rate data;

collecting data pertaining to a first mobility state and a second mobility state of the user, while estimating the heart rate data; and

processing the estimated heart rate data and the data pertaining to the first mobility state and the second mobility state, comprising:

identifying a transition state of the user between the first window and the second window as one of a first transition state, a second transition state, or a third transition state, in terms of transition between the first mobility state and the second mobility state while estimating the heart rate data;

filtering the estimated heart rate data based on the identified transition state of the user based on a first reference value, a second reference value or a third reference value, wherein the first reference value equals summation of a heart rate value in the first window and 'interval', the second reference value equals summation of a heart rate value in the second window and the 'interval' and the third reference value equals difference between the heart rate value in the second window and the 'interval', wherein the 'interval' is a heart rate change tolerance interval, and wherein filtering the estimated heart rate data if the identified transition state is the first transition state representing transition of the user from the first mobility state to the second mobility state between the first window and the second window of the plurality of time windows, by executing a first method, comprises:

checking whether the heart rate value in the second window of the plurality of time windows lies between the heart rate value in the first window and the first reference value;

if the heart rate value in the second window lies between the heart rate value in the first window and the first reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the heart rate value in the first window and the first reference value:

generating the filtered heart rate data as equal to summation of the heart rate value in the first window and a second incremental value; and

generating a filtered heart rate data as output.

10. The one or more non-transitory machine readable information storage mediums of claim 9, wherein the first mobility state is a state of rest and the second mobility state is a state of motion.

11. The one or more non-transitory machine readable information storage mediums of claim 9, wherein the second transition state represents the user continuing in the first mobility state between the first window and the second window of the plurality of time windows, wherein filtering the heart rate data if the identified transition state is the second transition state, by executing a second method, comprises:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the 'interval' to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by a value equal to a third incremental value.

12. The one or more non-transitory machine readable information storage mediums of claim 9, wherein the third transition state represents transition of the user from the second mobility state to the first mobility state or the user continuing in the second mobility state, between the first window and the second window of the plurality of time windows, wherein filtering the heart rate data if the identified transition state is the third transition state, by executing a third method, comprises:

checking whether the heart rate value in the second window lies between the second reference value and the third reference value;

if the heart rate value in the second window lies between the second reference value and the third reference value:

resetting value of the ‘interval’ to a first incremental value; and

generating the filtered heart rate data as equal to the heart rate value in the second window; and

if the heart rate value in the second window does not lie between the second reference value and the third reference value:

generating the filtered heart rate data as equal to the heart rate value in the first window; and

increasing value of the interval by the first incremental value.