We Claim:

1. A processor implemented method for estimating heart rate associated with a subject in presence of plurality of motion artifacts, comprising:

receiving, from a first sensor, a first signal associated with the subject, wherein the first signal corresponds to a photoplethysmography (PPG) signal;

receiving, from a second sensor, a second signal associated with the subject, wherein the second signal corresponds to an acceleration signal of at least one axis along three axes, wherein corresponding resultant signal is a combined acceleration value of the at least one axis;

filtering, a noise associated with at least one of the first sensor and the second sensor to discern cardiac signal by applying a same frequency range to the PPG signal and the acceleration signal;

learning, by a principal component analysis (PCA), a projection matrix (W) by projecting input signal into n-dimensional subspaces to obtain a plurality of principal components;

selecting, at least one principal component from the plurality of principal components, comprising:

(a) matching a dominant frequency of the principal components obtained from the PPG signal and a dominant frequency of the principal components obtained from the accelerometer signal, by applying a Fourier transform for a spectrum estimation; and

(b) computing, at least one of (i) a percentage of energy contributed by the principal component of the PPG signal, (ii) a percentage of energy contributed by the principal component of the accelerometer signal, or combination thereof;

estimating, the heart rate of the subject based on the at least one selected principal component; and

classifying by a Decision Tree Classifier, to determine whether that the principal component is associated with a cardiac cycle.

2. The method of claim 1, further comprising, mapping original time series into a sequence of lagged vectors for a subspace decomposition.

3. The method of claim 1, wherein at least one column of the projection matrix (W) represents eigenvector computed from a covariance matrix (C_H), wherein eigenvectors of the covariance matrix (C_H) exploits a temporal covariance of the time series computed at different lags and represented as a Hankel matrix form, wherein at least one column of the projected matrix (Y) corresponds to the plurality of principal components, wherein a resultant time series computed from the accelerometer signal is approximated by the plurality of principal components.

4. The method of claim 1, wherein at least one of the plurality of principal components is discarded if an absolute difference (d) is less than threshold, wherein the threshold is defined as a frequency resolution provided by the Fourier Transform.

5. The method of claim 1, wherein the percentage of energy is estimated from eigenvalues obtained from an Eigen decomposition of the covariance matrix (C_H).

6. A system (100) to estimate heart rate associated with a subject in presence of plurality of motion artifacts, wherein the system comprising:

a memory (102) storing instructions;

one or more communication interfaces (106); and

one or more hardware processors (104) coupled to the memory (102) via the one or more communication interfaces (106), wherein the one or more hardware processors (104) are configured by the instructions to:

receive, from a first sensor, a first signal associated with the subject, wherein the first signal corresponds to a photoplethysmography (PPG) signal;

receive, from a second sensor, a second signal associated with the subject, wherein the second signal corresponds to an acceleration signal of at least one axis along three axes, wherein corresponding resultant signal is a combined acceleration value of the at least one axis;

filter, a noise associated with at least one of the first sensor and the second sensor to discern cardiac signal by applying a same frequency range to the PPG signal and the acceleration signal;

learn, by a principal component analysis (PCA), a projection matrix (W) by projecting input signal into n-dimensional subspaces to obtain a plurality of principal components;

select, at least one principal component from the plurality of principal components, comprising:

(a) match, a dominant frequency of the principal components obtained from the PPG signal and a dominant frequency of the principal components obtained from the accelerometer signal, by applying a Fourier transform for a spectrum estimation; and

(b) compute, at least one of (i) a percentage of energy contributed by the principal component of the PPG signal, (ii) a percentage of energy contributed by the principal component of the accelerometer signal, or combination thereof;

estimate, the heart rate of the subject based on the at least one selected principal component; and

classify, by a Decision Tree Classifier, to determine whether that the principal component is associated with a cardiac cycle.

7. The system (100) of claim 6, wherein the one or more hardware processors are further configured to map original time series into a sequence of lagged vectors for a subspace decomposition.

8. The system (100) of claim 6, wherein at least one column of the projection matrix (W) represents eigenvector computed from a covariance matrix (C_H), wherein eigenvectors of the covariance matrix (C_H) exploits a temporal covariance of the time series computed at different lags and represented as a Hankel matrix form, wherein at least one column of the projected matrix (Y) corresponds to the plurality of principal components, wherein a resultant time series computed from the accelerometer signal is approximated by the plurality of principal components.

9. The system (100) of claim 6, wherein at least one of the plurality of principal components is discarded if an absolute difference (d) is less than threshold, wherein the threshold is defined as a frequency resolution provided by the Fourier Transform.

10. The system (100) of claim 6, wherein the percentage of energy is estimated from eigenvalues obtained from an Eigen decomposition of the covariance matrix (C_H).

11. 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:

receiving, from a first sensor, a first signal associated with the subject, wherein the first signal corresponds to a photoplethysmography (PPG) signal;

receiving, from a second sensor, a second signal associated with the subject, wherein the second signal corresponds to an acceleration signal of at least one axis along three axes, wherein corresponding resultant signal is a combined acceleration value of the at least one axis;

filtering, a noise associated with at least one of the first sensor and the second sensor to discern cardiac signal by applying a same frequency range to the PPG signal and the acceleration signal;

learning, by a principal component analysis (PCA), a projection matrix (W) by projecting input signal into n-dimensional subspaces to obtain a plurality of principal components;

selecting, at least one principal component from the plurality of principal components, comprising:

(a) matching a dominant frequency of the principal components obtained from the PPG signal and a dominant frequency of the principal components obtained from the accelerometer signal, by applying a Fourier transform for a spectrum estimation; and

(b) computing, at least one of (i) a percentage of energy contributed by the principal component of the PPG signal, (ii) a percentage of energy contributed by the principal component of the accelerometer signal, or combination thereof; and

estimating, the heart rate of the subject based on the at least one selected principal component of the subject in present of plurality of motion artifacts comprises:

mapping, original time series into a sequence of lagged vectors for a subspace decomposition; and

classifying, by a decision tree classifier, to determine whether that the principal component is associated with a cardiac cycle.

12. The one or more non-transitory machine-readable information storage mediums of claim 11, wherein at least one column of the projection matrix (W) represents eigenvector computed from a covariance matrix (C_H), wherein eigenvectors of the covariance matrix (C_H) exploits a temporal covariance of the time series computed at different lags and represented as a Hankel matrix form, wherein at least one column of the projected matrix (Y) corresponds to the plurality of principal components, wherein a resultant time series computed from the accelerometer signal is approximated by the plurality of principal components, wherein at least one of the plurality of principal components is discarded if an absolute difference (d) is less than threshold, wherein the threshold is defined as a frequency resolution provided by the Fourier Transform, wherein the percentage of energy is estimated from eigenvalues obtained from an Eigen decomposition of the covariance matrix (C_H).