CLAIMS

[Claim 1]

A system 100 for calibrating readings associated with one or more physiological parameters of a user, the system 100 comprising:

a wearable device 102 to sense data associated with one or more physiological parameters of a user;

one or more sensors 104 positioned in ambient space of the user to sense data associated with one or more ambient parameters of the user;

a sensor hub 106 configured to:

receive sensed data from the wearable device 102 via a first communication protocol;

receive sensed data from the one or more sensors 104 in the ambient space of the user via a second communication protocol;

detect occupancy of the ambient space by the user based on input received from one or more Infrared sensors from the one or more sensors 104 in the ambient space;

ascertain wearing of the wearable device 102 by the user upon detection of occupancy of the ambient space, wherein the ascertainment is based on variation in Received Signal Strength Indicator value of the sensed data, received over a predefined period of time, from the wearable device 102; and

a data processing engine 118 configured to:

correlate the sensed data from the wearable device 102, the sensed data from the one or more sensors 104 and ascertain wearing of the wearable device 102 by the user by employing one or more machine learning models to determine a bias in the sensed data from the wearable device 102 related to the one or more physiological parameters of a user; and

calibrate the readings associated with one or more physiological parameters of the user based on the determined bias in the sensed data from the wearable device 102.

[Claim 2]
The system 100 as claimed in claim 1, wherein the one or more physiological parameters of a user include core body temperature, oxygen saturation, blood pressure, glucose level, heart rate, activity and motion, and pulse rate.

[Claim 3]
The system 100 as claimed in claim 1, wherein the one or more sensors 104 are at least one of: a set of identical sensors and a set of non-identical sensors, further wherein the one or more sensors 104 include at least one of: one or more temperature sensors, one or more humidity sensors, one or more Passive Infrared based motion sensors, one or more light sensors, one or more pressure sensors, and one or more Magnetic Switch sensors.

[Claim 4]
The system 100 as claimed in claim 1, wherein the data processing engine 118 is communicatively coupled to the sensor hub 106 and is located in one of: ambient space of the user, a remote location and cloud environment.

[Claim 5]
The system 100 as claimed in claim 1, wherein for the ascertainment, the sensor hub 106 is configured to:

determine change in the Received Signal Strength Indicator value of the sensed data received from the wearable device 102 for a predetermined period of time upon detection of the presence of the user in the ambient space; and

compare the successively obtained Received Signal Strength Indicator value of the sensed data of the wearable device 102 over a period of time to determine if the user is wearing the wearable device 102.

[Claim 6]

The system 100 as claimed in claim 5, wherein when the result of the comparison indicates that the sensed data of the wearable device 102 and the sensed data of the one or more sensors 104 is same for the predetermined period of time, it is ascertained that the wearable device 102 is off the user's body and is measuring the ambient parameters of the user.

[Claim 7]

The system 100 as claimed in claim 5, wherein when the result of the comparison indicates that the sensed data of the wearable device 102 and the sensed data of the one or more sensors 104 have a predetermined difference for the predetermined period of time it is ascertained that the wearable device 102 is worn by the user and is measuring one or more physiological parameters of the user.

[Claim 8]

The system 100 as claimed in claim 1, wherein the data processing engine 118 is configured to:

create an annotated event timeline based on the received sensed data from the wearable device 102, received sensed data from the one or more sensors 104 and determined position of the wearable device 102 with respect to user's body;

generate a transfer curve by employing one or more machine learning models on the received sensed data from the wearable device 102, received sensed data from the one or more sensors 104 and determined position of the wearable sensor 102; and

calibrate the readings associated with one or more physiological parameters of the user based on the transfer curve.

[Claim 9]

An automated method to calibrate readings associated with one or more physiological parameters of a user, the automated method comprising:

sensing, by a wearable device, data associated with one or more physiological parameters of a user;

sensing, by a one or more sensors positioned in ambient space of the user, data associated with one or more ambient parameters of the user;

receiving the sensed data from the wearable device via a first communication protocol and the sensed data from the one or more sensors in the ambient space of the user via a second communication protocol;

detecting occupancy of the ambient space by the user based on input received from one or more Infrared sensors from the one or more sensors in the ambient space;

ascertaining wearing of the wearable device by the user upon detection of occupancy of the ambient space, wherein the ascertainment is based on variation in Received Signal Strength Indicator value of the sensed data, received over a predefined period of time, from the wearable device;

correlating the sensed data from the wearable device, the sensed data from the one or more sensors and ascertainment of wearing of the wearable device 102 by the user by employing one or more machine learning models to determine a bias in the sensed data from the wearable device related to the one or more physiological parameters of a user; and

calibrating the readings associated with one or more physiological parameters of the user based on the determined bias in the sensed data from the wearable device.

[Claim 10]

The automated method as claimed in claim 9, wherein the one or more physiological parameters of a user include core body temperature, oxygen saturation, blood pressure, glucose level, heart rate, activity and motion, and pulse rate.

[Claim 11]

The automated method as claimed in claim 9, wherein the one or more sensors are at least one of: set of identical sensors and set of non-identical sensor, further wherein the one or more sensors include at least one of: one or more temperature sensors, one or more humidity sensors, one or more Passive-Infrared based motion sensors, one or more light sensors, one or more pressure sensors and one or more door Magnetic Switch sensors.

[Claim 12]

The automated method as claimed in claim 9, wherein the ascertaining comprises:

determining change in the Received Signal Strength Indicator value of the sensed data received from the wearable device for a predetermined period of time upon detection of the presence of the user in the ambient space; and

comparing the successively obtained Received Signal Strength Indicator value of the sensed data of the wearable device over a period of time to determine if the user is wearing the wearable device.

[Claim 13]

The automated method as claimed in claim 12, wherein when the result of the comparison indicates that the sensed data of the wearable device and the sensed data of the one or more sensors are same for the predetermined period of time, ascertaining that

the wearable device is off the user's body and measuring the ambient parameters of the user.

[Claim 14]

The automated method as claimed in claim 12, wherein when the result of the comparison indicates that the sensed data of the wearable device and the sensed data of the one or more sensors have a predetermined difference for the predetermined period of time ascertaining that the wearable device is worn by the user and measuring one or more physiological parameters of the user.

[Claim 15]

The automated method as claimed in claim 9, further comprising:

creating an annotated event timeline based on the received sensed data from the wearable device, received sensed data from the one or more sensors and determined position of the wearable device with respect to the user's body;

generating a transfer curve by employing one or more machine learning model on the received sensed data from the wearable device, received sensed data from the one or more sensors and determined position of the wearable sensor; and

calibrating the readings associated with one or more physiological parameters of the user based on the transfer curve.

[Claim 16]

A computer program product comprising at least one computer-readable storage medium having computer-executable program code stored therein, the computer executable program code comprising instructions that when executed by a processor, cause the processor to:

sense, by a wearable device, data associated with one or more physiological parameters of a user;

sense, by a one or more sensors positioned in ambient space of the user, data associated with one or more ambient parameters of the user;

receive the sensed data from the wearable device via a first communication protocol and the sensed data from the one or more sensors in the ambient space of the user via a second communication protocol;

detect occupancy of the ambient space by the user based on input received from one or more Infra-red sensors from the one or more sensors in the ambient space;

ascertain wearing of the wearable device by the user upon detection of occupancy of the ambient space, wherein the ascertainment is based on variation in Received Signal Strength Indicator value of the sensed data, received over a predefined period of time, from the wearable device;

correlate the sensed data from the wearable device, the sensed data from the one or more sensors and ascertain wearing of the wearable device by the user by employing one or more machine learning models to determine a bias in the sensed data from the wearable device related to the one or more physiological parameters of a user; and

calibrate the readings associated with one or more physiological parameters of the user based on the determined bias in the sensed data from the wearable device.

[Claim 17]

The computer program product as claimed in claim 16, wherein for the ascertaining, the computer program product comprises instructions to:

determine change in the Received Signal Strength Indicator value of the sensed data received from the wearable device for a predetermined period of time upon detection of the presence of the user in the ambient space; and

compare the successively obtained Received Signal Strength Indicator value of the sensed data of the wearable device over a period of time to determine if the user is wearing the wearable device.

[Claim 18]

The computer program product as claimed in claim 17, further comprising instructions to:

ascertain that the wearable device is off the user's body and measuring the ambient parameters of the user, when the result of the comparison indicates that the sensed data of the wearable device and the sensed data of the one or more sensors are same for the predetermined period of time; and

ascertain that the wearable device is worn by the user and measuring one or more physiological parameters of the user, wherein when the result of the comparison indicates that the sensed data of the wearable device and the sensed data of the one or more sensors have a predetermined difference for the predetermined period of time.

[Claim 19]

The computer program product as claimed in claim 16, further comprising instructions to:

create an annotated event timeline based on the received sensed data from the wearable device, received sensed data from the one or more sensors and determined position of the wearable device with respect to the user's body;

generate a transfer curve by employing one or more machine learning model on the received sensed data from the wearable device, received sensed data from the one or more sensors and determined position of the wearable sensor; and

calibrate the readings associated with one or more physiological parameters of the user based on the transfer curve.

[Claim 20]

The system 100 as claimed in claim 1, wherein the calibration of the readings by the system is further associated with one or more ambient parameters of the user; and wherein the data processing engine 118 is further configured to correlate the sensed data from the calibrated wearable device 102, the sensed data from the one or more sensors 104 by employing one or more machine learning models to determine a bias in the sensed data from the one or more sensors 104 related to the one or more ambient parameters of the user.