Claims

[Claim 1]

A sweat and heart rate determination system, comprising:

a transmitter configured to transmit a radio wave to a human body;

a receiver configured to receive the reflection wave of the radio wave transmitted by the transmitter;

a heart rate determination part configured to determine a heart rate based on a result of a frequency analysis for the reflection wave received by the receiver;

a sweat determination part configured to determine a sweating state of the human body based on a strength of the reflection wave received by the receiver;

an output part configured to output information related to the heart rate determined by the heart rate determination part, and information related to the sweating state determined by the sweat determination part; and

an analysis part configured to calculate occurrence timings of a plurality of feature points related to the heart rate based on the result of the frequency analysis for the reflection wave received by the receiver, wherein

the heart rate determination part determines the heart rate based on the occurrence timings of the feature points calculated by the analysis part, and

the sweat determination part determines the sweating state based on the strength of the reflection wave corresponding to the feature points calculated by the analysis part.

[Claim 2]

The sweat and heart rate determination system of claim 1, wherein the transmitter transmits the radio wave to the human body via a wear item that is on the human body, and

the receiver receives the reflection wave that includes a component of reflection of the radio wave at the human body and a component of reflection of the radio wave at the wear item.

[Claim 3]

The sweat and heart rate determination system of claim 2, wherein the wear item is on an upper-body side of the human body.

[Claim 4]

The sweat and heart rate determination system of claim 2, wherein the output part is further configured to output an alarm when a determination result by the sweat determination part indicates a state in which a sweating amount does not change after the sweating amount has increased.

[Claim 5]

The sweat and heart rate determination system of claim 2, wherein the output part varies a content of the alarm to be outputted between a case in which the determination result by the sweat determination part indicates the state in which the sweating amount does not change after indicating the increased sweating amount, and a case in which the determination result by the sweat determination part indicates the state in which the sweating amount decreases after indicating the increased sweating amount.

[Claim 6]

The sweat and heart rate determination system of claim 1, wherein the output part is further configured to change a way of outputting based on a combination of a determination result by the heart rate determination part and a determination result by the sweat determination part.

[Claim 7]

The sweat and heart rate determination system of claim 1, wherein the output part is further configured to determine a state of the human body based on a combination of a determination result by the heart rate determination part and a change in the determination result in a time series by the sweat determination part.

[Claim 8]

The sweat and heart rate determination system of any one of claims 1 through 7, wherein the radio wave has a frequency in UHF band or in SHF band.

[Claim 9]

The sweat and heart rate determination system of claim 1 configured to be carried when the sweat and heart rate determination system is used.

[Claim 10]

A sweat and heart rate determination apparatus, comprising:

a wireless receiver configured to receive a signal representing a reflection wave of a radio wave transmitted to a human body;

a heart rate determination part configured to

determine a heart rate based on a result of a frequency analysis for the reflection wave received by the wireless receiver;

a sweat determination part configured to determine a sweating state of the human body based on a strength of the reflection wave received by the wireless receiver;

an output part configured to output information related to the heart rate determined by the heart rate determination part, and information related to the sweating state determined by the sweat determination part; and

an analysis part configured to calculate occurrence timings of a plurality of feature points related to the heart rate based on the result of the frequency analysis for the reflection wave received by the receiver, wherein

the heart rate determination part determines the heart rate based on the occurrence timings of the feature points calculated by the analysis part, and

the sweat determination part determines the sweating state based on the strength of the reflection wave corresponding to the feature points calculated by the analysis part.

[Claim 11]

A method of determining a sweat and heart rate to be executed by a computer, the method comprising:

receiving a signal representing a reflection wave of a radio wave transmitted to a human body;

calculating occurrence timings of a plurality of feature points related to a heart rate based on a result of a frequency analysis for the received reflection wave;

determining the heart rate based on the occurrence timings of the feature points calculated;

determining a sweating state of the human body based on a strength of the received reflection wave corresponding to the feature points calculated; and

outputting information related to the determined heart rate and information related to the determined sweating state.