[0009]

Embodiments of the present invention seek to solve the above problems and provide a blood sugar level prediction device, a measurement device, a blood sugar level prediction method and a computer program that enable the user's blood sugar level to be correctly predicted while reducing the burden on the user at the time of blood sugar level measurement.

MEANS FOR SOLVING THE PROBLEMS

[0010]

According to a first aspect of the present invention, there is provided a blood sugar level prediction device for predicting a user's blood sugar level, including a pattern selection unit that selects one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user, ~~and~~ a correction processing unit that corrects the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user~~.~~, and a set condition determination unit that determines, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition, wherein if it is determined by the set condition determination unit that the obtained measured values do not meet the set condition, the pattern selection unit executes selection of the pattern again and the correction processing unit corrects the newly selected pattern.

[0011]

According to a second aspect of the present invention, there is provided a measurement device that measures a blood sugar level of a user though optical measurement, including a measurement unit that executes the optical measurement, a standard curve database that stores a standard curve for converting a measured value that is obtained by executing the optical measurement into a blood sugar level, for each size of corresponding blood sugar levels, a control processing unit that calculates a blood sugar level by selecting one of the standard curves and applying the measured

value obtained by executing the optical measurement to the selected standard curve, and a blood sugar level prediction unit that predicts the blood sugar level of the user by selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user, and correcting the selected pattern using a plurality of measured values obtained by executing the optical measurement over a number of measurement dates, targeting the

user, wherein the control processing unit, in a case where selection and correction of the pattern have been executed by the blood sugar level prediction unit, predicts the blood sugar level using the corrected pattern and selects the standard curve based on the predicted blood sugar level and the blood sugar level prediction unit determines, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition and, if it is determined that the obtained measured values do not meet the set condition, select one pattern and correct the selected pattern.

[0012]

According to a third aspect of the present invention, there is provided a blood sugar level prediction method for predicting a blood sugar level of a user, having the steps of (a) selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user, ~~and~~ (b) correcting the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user, and (c) determining, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition, wherein if it is determined in the step (c) that the obtained measured values do not meet the set condition, the step (a) and the step (b) are executed again.

[0013]

According to a fourth aspect of the present invention, there is provided a computer-readable storage medium storing a computer program for predicting a blood sugar level of a user by computer, the program including a command that causes the computer to execute the steps of (a) selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user, ~~and~~ (b) correcting the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user, and (c) determining, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the

optical measurement of blood sugar levels that targeted the blood of the user meet a set condition, and if it is determined in the step (c) that the obtained measured values do not meet the set condition, the step (a) and the step (b) are executed again.

ADVANTAGEOUS EFFECTS OF THE INVENTION

[0014]

According to embodiments of the present invention, the user's blood sugar level can be correctly predicted, while reducing the burden on the user at the time of blood sugar level measurement.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

CLAIMS

1. A blood sugar level prediction device for predicting a blood sugar level of a user, comprising:

a pattern selection unit that selects one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user; ~~and~~

a correction processing unit that corrects the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user~~.~~; and

a set condition determination unit that determines, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition,

wherein if it is determined by the set condition determination unit that the obtained measured values do not meet the set condition, the pattern selection unit executes selection of the pattern again and the correction processing unit corrects the newly selected pattern.

2. The blood sugar level prediction device according to claim 1,

wherein the pattern selection unit selects the pattern using a blood sugar level after eating in addition to the blood sugar level at the fasting time of the user.

3. The blood sugar level prediction device according to claim 1 or 2,

wherein the plurality of patterns each include a set of functions that are set for every timeslot whose reference time is the fasting time of the user and that specify a relationship between elapsed time from the reference time and blood sugar level, and

the correction processing unit converts a measurement time of the optical measurement into an elapsed time from the reference time, derives, for each of the plurality of measured values, a square root of a residual error between the measured value and a value calculated by applying the converted elapsed time to the functions of

the selected pattern, and corrects each of the functions of the selected time series variation pattern such that when the square roots are summed, the sum is minimized.

~~4. The blood sugar level prediction device according to any of claims 1 to 3, further comprising:~~

~~a set condition determination unit that determines, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set~~

~~condition,~~

~~wherein if it is determined by the set condition determination unit that the obtained measured values do not meet the set condition, the pattern selection unit executes selection of the pattern again and the correction processing unit corrects the newly selected pattern.~~

~~5~~4. A measurement device that measures a blood sugar level of a user through optical measurement, comprising:

a measurement unit that executes the optical measurement;

a standard curve database that stores a standard curve for converting a measured value that is obtained by executing the optical measurement into a blood sugar level, for each size of corresponding blood sugar levels;

a control processing unit that calculates a blood sugar level by selecting one of the standard curves and applying the measured value obtained by executing the optical measurement to the selected standard curve; and

a blood sugar level prediction unit that predicts the blood sugar level of the user by selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user, and correcting the selected pattern using a plurality of measured values obtained by executing the optical measurement over a number of measurement dates, targeting the user,

wherein the control processing unit, in a case where selection and correction of the pattern have been executed by the blood sugar level prediction unit, predicts the blood sugar level using the corrected pattern and selects the standard curve based on the predicted blood sugar level~~.~~; and

, the blood sugar level prediction unit determines, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition and, if it is determined that the obtained measured values do not meet the set condition, select one pattern and correct the selected pattern.

65. A blood sugar level prediction method for predicting a blood sugar level of a user, comprising the steps of:

(a) selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user; and

(b) correcting the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user.; and

(c) determining, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition,

wherein if it is determined in the step (c) that the obtained measured values do not meet the set condition, the step (a) and the step (b) are executed again.

76. The blood sugar level prediction method according to claim 65,

wherein the step (a) comprises selecting the pattern using a blood sugar level after eating in addition to the blood sugar level at the fasting time of the user.

87. The blood sugar level prediction method according to claim 65 or 76,

wherein the plurality of patterns each include a set of functions that are set for every timeslot whose reference time is the fasting time of the user and that specify a relationship between elapsed time from the reference time and blood sugar level, and

the step (b) comprises converting a measurement time of the optical measurement into an elapsed time from the reference time, deriving, for each of the plurality of measured values, a square root of a residual error between the measured value and a value calculated by applying the converted elapsed time to the functions of the selected pattern, and correcting each of the functions of the selected time series variation pattern such that when the square roots are summed, the sum is minimized.

9. The blood sugar level prediction method according to any of claims 6 to 8, further comprising the step of:

(c) determining, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition,

wherein if it is determined in the step (c) that the obtained measured values do

~~not meet the set condition, the step (a) and the step (b) are executed again.~~

~~108~~. A computer-readable storage medium storing a computer program for predicting a blood sugar level of a user by computer, the program including a command that causes the computer to execute the steps of:

(a) selecting one pattern from a plurality of preset blood sugar level time series variation patterns, based on a blood sugar level at a fasting time of the user; ~~and~~

(b) correcting the selected pattern using a plurality of measured values obtained by executing optical measurement of blood sugar levels over a number of measurement dates, targeting the user~~.~~; and

(c) determining, after a set time period has elapsed since selection of the pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition, and

if it is determined in the step (c) that the obtained measured values do not meet the set condition, the step (a) and the step (b) are executed again.

~~11~~9. The computer-readable storage medium according to claim ~~10~~8,

wherein the step (a) comprises selecting the pattern using a blood sugar level after eating in addition to the blood sugar level at the fasting time of the user.

~~12~~10. The computer-readable storage medium according to claim ~~10~~ 8 or ~~11~~9,

wherein the plurality of patterns each include a set of functions that are set for every timeslot whose reference time is the fasting time of the user and that specify a relationship between elapsed time from the reference time and blood sugar level, and

the step (b) comprises converting a measurement time of the optical measurement into an elapsed time from the reference time, deriving, for each of the plurality of measured values, a square root of a residual error between the measured value and a value calculated by applying the converted elapsed time to the functions of the selected pattern, and correcting each of the functions of the selected time series variation pattern such that when the square roots are summed, the sum is minimized.

~~13. The computer-readable storage medium according to any of claims 10 to 12,~~

~~wherein the program further includes a command that causes the computer to execute the step of:~~

~~(c) determining, after a set time period has elapsed since selection of the~~

~~pattern, whether the measured values obtained by the optical measurement of blood sugar levels that targeted the blood of the user meet a set condition, and~~

~~if it is determined in the step (c) that the obtained measured values do not meet the set condition, the step (a) and the step (b) are executed again.~~