CLAIMS

[Claim 1]

A model generation device, comprising:

a teacher data acquisition part, configured to acquire a plurality of teacher data based on a plurality time series data of a control object, located in a specified zone, controlled by a control system at a plurality of time points, wherein each of the time series data includes one or more target setting values of the specified zone and a plurality of measured values, one of the time series data corresponds to one of the teacher data, and each of the teacher data uses the measured values included in one corresponding time series data as an explanatory variable and a state of the control object at the time of the measured values at each of the time points as an objective variable; and

a model generator, configured to generate, by statistical machine learning based on the plurality of teacher data, a model that uses the measured value newly measured as an input value and derives a probability of each of the plurality of states the control object is able to take at the time of the input value,

wherein the teacher data acquisition part is further configured to

for each of the time points, by comparing with one of the target setting values of the time series data of a next time point, determine whether the target setting value of each of the time points has changed, so as to determine the state of the control object at each of the time points.

[Claim 2]

The model generation device according to claim 1, further comprising:

a probability acquisition part, configured to input the measured value newly measured to the model and acquire the probability of each of the plurality of states derived by the model; and

a notifier, configured to issue a notification of at least a state with the highest probability among the plurality of states based on the probability of each of the plurality of states acquired by the probability acquisition part.

[Claim 3]

The model generation device according to claim 1, further comprising:

a probability acquisition part, configured to input the measured value newly measured to the model and acquire the probability of each of the plurality of states derived by the model; and

a notifier, configured to issue a notification of at least a portion of the probability of each of the plurality of states acquired by the probability acquisition part.

[Claim 4]

The model generation device according to claim 1, further comprising:

a probability acquisition part, configured to input the measured value newly measured to the model and acquire the probability of each of the plurality of states derived by the model; and

a notifier, configured to issue a notification that any of the probability of each of the plurality of states acquired by the probability acquisition part exceeds a predetermined value when the same occurs.

[Claim 5]

The model generation device according to any one of claims 1 to 4, wherein

the model is a model using equation (A) by a naive Bayes method:

$$P(y|x)=P(x|y)*P(y)/P(x).....(A)$$

wherein x is the measured value, and y is any of the plurality of states.

[Claim 6]

The model generation device according to claim 5, wherein

P(y) is user settable.

[Claim 7]

The model generation device according to claim 5 or 6, wherein

P(x|y) is specified by using a histogram showing a distribution of P(x|y) for each measured value.

[Claim 8]

The model generation device according to any one of claims 1 to 7, wherein

the teacher data acquisition part is configured to specify a state of the control object as the objective variable based on information input by a user to the control system that controls the control object.

[Claim 9]

The model generation device according to claim 8, wherein

the control object is air in an air conditioning zone;

the control system is an air conditioning system that controls the air;

the teacher data acquisition part is configured to take the objective variable of the teacher data when the user raises a set temperature of the air conditioning system as “cold” and take the objective variable of the teacher data when the user lowers the set temperature of the air conditioning system as “hot”.

[Claim 10]

A model generation method, comprising:

a teacher data acquisition step, configured to acquire a plurality of teacher data based on a plurality time series data of a control object, located in a specified zone, controlled by a control system at a plurality of time points, wherein each of the time series data includes one or more target setting values of the specified zone and a plurality of measured values, one of the time series data corresponds to one of the teacher data, and each of the teacher

data uses the measured values included in one corresponding time series data as an explanatory variable and a state of the control object at the time of the measured values at each of the time points as an objective variable; and

a model generation step, configured to generate, by statistical machine learning based on the plurality of teacher data, a model that uses the measured value newly measured as an input value and derives a probability of each of the plurality of states the control object is able to take at the time of the input value,

wherein the teacher data acquisition step is further configured to

for each of the time points, by comparing with one of the target setting values of the time series data of a next time point, determine whether the target setting value of each of the time points has changed, so as to determine the state of the control object at each of the time points.

[Claim 11]

A model generation program, causing a computer to execute:

a teacher data acquisition step, configured to acquire a plurality of teacher data based on a plurality time series data of a control object, located in a specified zone, controlled by a control system at a plurality of time points, wherein each of the time series data includes one or more target setting value of the specified zone and a plurality of measured values, one of the time series data corresponds to one of the teacher data, and each of the teacher data uses the measured values included in one corresponding time series data as an explanatory variable and a state of the control object at the time of the measured values at each of the time points as an objective variable; and

a model generation step, configured to generate, by statistical machine learning based on the plurality of teacher data, a model that uses the measured value newly measured as an

input value and derives a probability of each of the plurality of states the control object is able to take at the time of the input value,

wherein the teacher data acquisition step is further configured to

for each of the time points, by comparing with one of the target setting values of the time series data of a next time point, determine whether the target setting value of each of the time points has changed, so as to determine the state of the control object at each of the time points.