CLAIMS

1. An information processing system that provides a combination of parameter values of a substrate processing apparatus, the system comprising:

a first artificial intelligence unit that performs learning using a plurality of first learning datasets input values of which are sets of parameters different from each other in a combination of parameter types and output values of which are corresponding performance values of the substrate processing apparatus, and after the learning uses, as an input, each of a plurality of verification datasets including combinations of the parameter types that are same as the combinations of the parameter types at the time of learning, to predict a performance value;

a selection unit that selects one set of parameter types from a plurality of sets of parameter types included in the plurality of verification datasets, by using at least one of a value indicating a percentage of correct answer of the predicted performance value, a time required for the learning, and a time required for predicting the performance value; and

a second artificial intelligence unit that performs learning using a plurality of second learning datasets an input value of which is a set of past parameter values including the selected set of parameter types and an output

value of which is a corresponding past performance value, and after the learning, predicts performance values of the target substrate processing apparatus obtained by changing variable parameters among the parameters including the selected set of parameter types with, as an input, a fixed parameter intrinsically determined for a target substrate processing apparatus among parameters including the selected set of parameter types, and outputs a combination of parameter values yielding a performance value, among the predicted performance values, satisfying an extraction criterion.

2. The information processing system according to claim 1 further comprising

a determination unit that determines a correlation between each of a plurality of parameter values and performance values of the substrate processing apparatus, and uses a plurality of the determined correlations to determine parameter types of a plurality of parameters used by the first artificial intelligence unit as input values.

3. The information processing system according to claim 2, wherein

the determination unit determines each mutual correlation between the plurality of parameter values of the substrate processing apparatus, and uses the determined mutual correlation to add or partially or entirely replace

the parameter types of the plurality of parameters used by the second artificial intelligence unit as the input values.

4. The information processing system according to any one of claims 1 to 3 further comprising

an exclusion criterion determination unit that determines a formula of correlation between one parameter value and performance value of the substrate processing apparatus and uses the formula of correlation to determine a criterion for excluding an abnormal value, wherein

the selection unit selects the set of parameter types excluding a parameter satisfying the determined criterion.

5. The information processing system according to any one of claims 1 to 4, wherein

the second artificial intelligence unit performs further learning with sets of a plurality of parameter value used by the target substrate processing apparatus and corresponding performance values added to the second learning datasets, or replaced with existing data included in the second learning datasets, and after the learning, predicts performance values of the substrate processing apparatus with, as an input, a plurality of verification datasets including parameters including the selected set of parameter types, and outputs a combination of parameter values yielding a performance value, among the predicted

performance values, satisfying the extraction criterion.

6. An information processing method of providing a combination of parameter values of a substrate processing apparatus, the method comprising:

performing learning using a plurality of first learning datasets input values of which are sets of parameters different from each other in a combination of parameter types and output values of which are corresponding performance values of the substrate processing apparatus, and after the learning, predicts a performance value with, as an input, each of a plurality of verification datasets including combinations of the parameter types that are common to the combinations of the parameter types at the time of learning;

selecting one set of parameter types from a plurality of sets of parameter types included in the plurality of verification datasets, by using at least one of a value indicating a percentage of correct answer of the predicted performance value, a time required for the learning, and a time required for predicting the performance value; and

performing learning using a plurality of second learning datasets an input value of which is a set of past parameter values including the selected set of parameter types and an output value of which is a corresponding past performance value, and after the learning, predicting

performance values of the target substrate processing apparatus with, as an input, a plurality of verification datasets including parameters including the selected set of parameter types, and outputting a combination of parameter values yielding a performance value, among the predicted performance values, satisfying an extraction criterion.

7. A program causing a computer used in the information processing system according to any one of claims 1 to 5 to function as

a first artificial intelligence unit that performs learning using a plurality of first learning datasets input values of which are sets of parameters different from each other in a combination of parameter types and output values of which are corresponding performance values of the substrate processing apparatus, and after the learning, predicts a performance value with, as an input, each of a plurality of verification datasets including combinations of the parameter types that are common to the combinations of the parameter types at the time of learning.

8. A program causing a computer used in the information processing system according to any one of claims 1 to 5 to function as

a second artificial intelligence unit that performs learning using a plurality of second learning datasets an input value of which is a set of past parameter values

including the selected set of parameter types and an output value of which is a corresponding past performance value, and after the learning, predicts performance values of the target substrate processing apparatus obtained by changing variable parameters among the parameters including the selected set of parameter types with, as an input, a fixed parameter intrinsically determined for a target substrate processing apparatus among parameters including the selected set of parameter types, and outputs a combination of parameter values yielding a performance value, among the predicted performance values, satisfying an extraction criterion.