

CLAIMS

What is claimed is:

1. A method for string connecting photovoltaic modules, applicable to a computer device, the method comprising:

5 acquiring position information of n photovoltaic modules to be connected, wherein n is an integer greater than 1;

 categorizing the n photovoltaic modules into m partitions based on the position information of the n photovoltaic modules, wherein each of the partitions comprises a plurality of photovoltaic modules, and m is an integer greater than 1 and less than n ;

10 generating k candidate connection solutions of an i^{th} partition in the m partitions, wherein the i^{th} partition comprises n_i photovoltaic modules, and each of the k candidate connection solutions uses one of the n_i photovoltaic modules as a starting point, and obtains at least one string of photovoltaic modules by simulating connection of the n_i photovoltaic modules according to a preset connection solution, i is a positive integer less than or equal to m , n_i is
15 an integer greater than 1 and less than n , and k is an integer greater than 1;

 calculating estimated cable use amounts respectively corresponding to the k candidate connection solutions; and

 selecting a target connection solution corresponding to the i^{th} partition from the k candidate connection solutions based on the estimated cable use amounts respectively
20 corresponding to the k candidate connection solutions.

2. The method according to claim 1, wherein generating the k candidate connection solutions of the i^{th} partition in the m partitions comprises:

 generating a matrix of the i^{th} partition, wherein the matrix is configured to characterize a
25 position distribution of the n_i photovoltaic modules in the i^{th} partition; and

 generating the k candidate connection solutions based on the matrix.

3. The method according to claim 2, wherein generating the k candidate connection

solutions based on the matrix comprises:

selecting one photovoltaic module from the n_i photovoltaic modules as the starting point, and obtaining one candidate connection solution by connecting the n_i photovoltaic modules according to a preset module string capacity and a preset module selection priority; and

5 replacing the starting point, and obtaining another candidate connection solution by connecting the n_i photovoltaic modules by the above step, until the k candidate connection solutions are generated;

wherein the module string capacity is a number of photovoltaic modules contained in the string of photovoltaic modules, the matrix comprises at least one photovoltaic array, and the
10 module selection priority is in a descending order of: the photovoltaic modules of a first photovoltaic array, the photovoltaic modules of a second photovoltaic array, and the photovoltaic modules of a third photovoltaic array in sequence;

wherein the first photovoltaic array is a photovoltaic array where the photovoltaic modules in a currently generated string of photovoltaic modules are located, the second
15 photovoltaic array is an adjacent photovoltaic array of the first photovoltaic array in a first direction, and the third photovoltaic array is an adjacent photovoltaic array of the first photovoltaic array in a second direction; and a distance between the first photovoltaic array and the second photovoltaic array is less than a distance between the first photovoltaic array and the third photovoltaic array.

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4. The method according to claim 3, wherein selecting one photovoltaic module from the n_i photovoltaic modules as the starting point, and obtaining one candidate connection solution by connecting the n_i photovoltaic modules according to the preset module string capacity and the preset module selection priority comprises:

25 selecting one photovoltaic module from the n_i photovoltaic modules as the starting point, and obtaining the string of photovoltaic modules by preferentially connecting the photovoltaic modules in the same photovoltaic array according to the module string capacity;

connecting the photovoltaic module across the photovoltaic array when an unconnected photovoltaic module is present in the photovoltaic array; and

30 obtaining one candidate connection solution after the n_i photovoltaic modules are

connected.

5. The method according to claim 4, wherein connecting the photovoltaic module across the photovoltaic array comprises:

5 determining a target photovoltaic module that belongs to a different photovoltaic array from the unconnected photovoltaic module and is most proximal to the unconnected photovoltaic module;

disconnecting the string of photovoltaic modules where the target photovoltaic module is located when the target photovoltaic module has been connected to the string; and

10 obtaining a string of photovoltaic modules across the photovoltaic array by connecting the target photovoltaic module to the unconnected photovoltaic module.

6. The method according to any one of claims 1 to 5, wherein prior to generating the k candidate connection solutions of the i^{th} partition in the m partitions, the method further comprises:

15 acquiring parameters and history environmental information of the n_i photovoltaic modules;

determining a maximum value and a minimum value of numbers of photovoltaic modules contained in the strings of photovoltaic modules based on the parameters and the history environmental information of the n_i photovoltaic modules; and

20 setting a module string capacity of the i^{th} partition based on the maximum value and the minimum value, wherein the module string capacity is the number of photovoltaic modules contained in the string of photovoltaic modules, and the module string capacity is between the maximum value and the minimum value.

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7. The method according to any one of claims 1 to 5, wherein selecting the target connection solution corresponding to the i^{th} partition from the k candidate connection solutions based on the estimated cable use amounts respectively corresponding to the k candidate connection solutions comprises:

30 determining a minimum value of the estimated cable use amounts respectively

corresponding to the k candidate connection solutions; and

determining the candidate connection solution corresponding to the minimum value of the estimated cable use amounts as the target connection solution corresponding to the i^{th} partition.

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8. An apparatus for string connecting photovoltaic modules, comprising:

an information acquiring module, configured to acquire position information of n photovoltaic modules to be connected, wherein n is an integer greater than 1;

10 a module categorizing module, configured to categorize the n photovoltaic modules into m partitions based on the position information of the n photovoltaic modules, wherein each of the partitions comprises a plurality of photovoltaic modules, and m is an integer greater than 1 and less than n;

15 a solution generating module, configured to generate k candidate connection solutions of an i^{th} partition in the m partitions, wherein the i^{th} partition comprises n_i photovoltaic modules, and each of the k candidate connection solutions uses one of the n_i photovoltaic modules as a starting point, and obtains at least one string of photovoltaic modules by simulating connection of the n_i photovoltaic modules according to a preset connection solution, i is a positive integer less than or equal to m, n_i is an integer greater than 1 and less than n, and k is an integer greater than 1;

20 a use amount calculating module, configured to calculate estimated cable use amounts respectively corresponding to the k candidate connection solutions; and

25 a solution selecting module, configured to select a target connection solution corresponding to the i^{th} partition from the k candidate connection solutions based on the estimated cable use amounts respectively corresponding to the k candidate connection solutions.

9. A computer device, comprising a processor and a memory storing a computer program therein, wherein the computer program, when loaded and run by the processor, causes the processor to perform the method for string connecting photovoltaic modules as defined in any
30 one of claims 1 to 7.

10. A computer-readable storage medium storing a computer program therein, wherein the computer program, when loaded and run by the processor, causes the processor to perform the method for string connecting photovoltaic modules as defined in any one of claims 1 to 7.

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