CLAIMS

~~What is claimed is:~~

1. A map generation method, performed by an electronic device, the method comprising:

selecting N sub-level maps from a sub-level map library, N being a natural number greater than 1;

sequentially placing first M sub-level maps of the N sub-level maps in a predetermined map region, N>M, the first M sub-level maps being all located in the map region, and the first M sub-level maps not overlapping with each other; and

sequentially placing to-be-placed sub-level maps, which meet a predetermined condition, of N-M sub-level maps in the map region to obtain a target map, the N-M sub-level maps being sub-level maps of the N sub-level maps other than the first M sub-level maps, and the predetermined condition comprising: when the to-be-placed sub-level maps are located in a target candidate region of the map region, the to-be-placed sub-level maps not overlapping with the sub-level maps placed in the map region and being connected to at least one of the sub-level maps placed in the map region, wherein two sub-level maps are considered to be connected when a distance between the two sub-level maps meets a certain condition.

2. The method according to claim 1, wherein the sequentially placing to-be-placed sub-level maps, which meet a predetermined condition, of N-M sub-level maps in the map region comprises:

determining, sequentially for current to-be-placed sub-level maps of the N-M sub-level maps, whether the target candidate region exists in the map region, wherein the target candidate region is used for placing the current to-be-placed sub-level maps; and

determining, in response to the determination that the target candidate region exists, the current to-be-placed sub-level maps as the to-be-placed sub-level maps which meet the predetermined condition, and placing the current to-be-placed sub-level maps in the target candidate region of the map region.

3. The method according to claim 2, wherein the determining whether the target candidate region exists in the map region comprises:

determining whether a target placement position corresponding to the current to-be-placed sub-level maps exists in the map region, wherein the target placement position is used for placing a central point of a first region in which the current to-be-placed sub-level maps are located, and when the central point is located at the target placement position, the first region does not overlap

with all regions occupied by the sub-level maps placed in the map region, and a distance between at least one side in the first region and one side in the regions occupied by the sub-level maps placed in the map region is greater than 0 and less than a predetermined distance threshold; and

determining, in response to the determination that the target placement position exists in the map region, that the target candidate region exists in the map region, wherein the target candidate region is the first region in which the current to-be-placed sub-level maps are located when the central point is located at the target placement position.

4. The method according to claim 2, wherein the determining whether the target candidate region exists in the map region comprises:

determining whether a target placement position corresponding to the current to-be-placed sub-level maps exists in the map region, wherein the target placement position is used for placing a central point of a first region in which the current to-be-placed sub-level maps are located, and when the central point is located at the target placement position, the first region does not overlap with all regions occupied by the sub-level maps placed in the map region, and at least one side in the first region overlaps with one side in the regions occupied by the sub-level maps placed in the map region; and

determining, in response to the determination that the target placement position exists in the map region, that the target candidate region exists in the map region, wherein the target candidate region is the first region in which the current to-be-placed sub-level maps are located when the central point is located at the target placement position.

5. The method according to claim 4, wherein when the current to-be-placed sub-level maps are placed in the target candidate region of the map region, the method further comprises:

providing, in the map region, a target transition map on an idle region adjacent to the target candidate region, wherein the target transition map is used for connecting the current to-be-placed sub-level maps with the idle region, the idle region is a region, which is not provided with the sub-level maps and a transition map of a target type, in the map region, and the target transition map is of the target type.

6. The method according to claim 5, wherein the providing, in the map region, a target transition map on an idle region adjacent to the target candidate region comprises:

acquiring a target vertex connected to a vertex of the target candidate region and in vertices of the idle region in which the target transition map is located;

setting a height of the target vertex in the map region to a first height, wherein a height of the

vertex of the target candidate region in the map region is the first height; and

setting a height of the vertices of the idle region other than the target vertex in the map region to a second height, wherein the second height is less than the first height.

7. The method according to claim 4, wherein after the sequentially placing to-be-placed sub-level maps, which meet a predetermined condition, of N-M sub-level maps in the map region, the method further comprises:

determining, when each sub-level map placed in the map region occupies one cell in the map region, whether a target cell exists in the cell occupied by the sub-level map, wherein a quantity of cells that are connected to the target cell and occupied by the sub-level maps placed in the map region is greater than or equal to a predetermined quantity threshold; and

combining, in response to the determination that the target cell exists, the target cell and sub-level maps on the cells that are connected to the target cell and occupied by the sub-level maps placed in the map region to form a target level map.

8. The method according to any one of claims 1 to 7, wherein the sequentially placing to-be-placed sub-level maps, which meet a predetermined condition, of N-M sub-level maps in the map region comprises:

determining whether an area of the sub-level maps placed in the map region exceeds a predetermined area threshold after an i^{th} sub-level map of the N sub-level maps is placed in the map region, wherein $M<i<N$; and

stopping placing $(i+1)^{th}$ to N^{th} sub-level maps of the N sub-level maps in the map region when the area of the sub-level maps placed in the map region exceeds the predetermined area threshold.

9. A map generation apparatus, comprising:

a selection unit configured to select N sub-level maps from a sub-level map library, N being a natural number greater than 1;

a first placement unit configured to sequentially place first M sub-level maps of the N sub-level maps in a predetermined map region, $N>M$, the first M sub-level maps being all located in the map region, and the first M sub-level maps not overlapping with each other; and

a second placement unit configured to sequentially place to-be-placed sub-level maps, which meet a predetermined condition, of N-M sub-level maps in the map region to obtain a target map, the N-M sub-level maps being sub-level maps of the N sub-level maps other than the first M sub-level maps, and the predetermined condition comprising: when the to-be-placed sub-level maps are

located in a target candidate region of the map region, the to-be-placed sub-level maps not overlapping with the sub-level maps placed in the map region and being connected to at least one of the sub-level maps placed in the map region, wherein two sub-level maps are considered to be connected when a distance between the two sub-level maps meets a certain condition.

10. The apparatus according to claim 9, wherein the first placement unit comprises:

a first determination module configured to determine, sequentially for current to-be-placed sub-level maps of the N-M sub-level maps, whether the target candidate region exists in the map region, wherein the target candidate region is used for placing the current to-be-placed sub-level maps; and

a placement module configured to determine, in response to the determination that the target candidate region exists, the current to-be-placed sub-level maps as the to-be-placed sub-level maps which meet the predetermined condition, and place the current to-be-placed sub-level maps in the target candidate region of the map region.

11. The apparatus according to claim 10, wherein the first determination module comprises:

a first determination sub-module configured to determine whether a target placement position corresponding to the current to-be-placed sub-level maps exists in the map region, wherein the target placement position is used for placing a central point of a first region in which the current to-be-placed sub-level maps are located, and when the central point is located at the target placement position, the first region does not overlap with all regions occupied by the sub-level maps placed in the map region, and a distance between at least one side in the first region and one side in the regions occupied by the sub-level maps placed in the map region is greater than 0 and less than a predetermined distance threshold; and

a second determination sub-module configured to determine, in response to the determination that the target placement position exists in the map region, that the target candidate region exists in the map region, wherein the target candidate region is the first region in which the current to-be-placed sub-level maps are located when the central point is located at the target placement position.

12. The apparatus according to claim 10, wherein the first determination module comprises:

a third determination sub-module configured to determine whether a target placement position corresponding to the current to-be-placed sub-level maps exists in the map region, wherein the target placement position is used for placing a central point of a first region in which the current to-be-placed sub-level maps are located, and when the central point is located at the target placement position, the first region does not overlap with all regions occupied by the sub-level maps placed in

the map region, and at least one side in the first region overlaps with one side in the regions occupied by the sub-level maps placed in the map region; and

a fourth determination sub-module configured to determine, in response to the determination that the target placement position exists in the map region, that the target candidate region exists in the map region, wherein the target candidate region is the first region in which the current to-be-placed sub-level maps are located when the central point is located at the target placement position.

13. The apparatus according to claim 12, wherein the apparatus further comprises:

a third setting unit configured to provide, when the current to-be-placed sub-level maps are placed in the target candidate region of the map region, in the map region, a target transition map on an idle region adjacent to the target candidate region, wherein the target transition map is used for connecting the current to-be-placed sub-level maps with the idle region, the idle region is a region, which is not provided with the sub-level maps and a transition map of a target type, in the map region, and the target transition map is of the target type.

14. The apparatus according to claim 13, wherein the third setting unit comprises:

an acquisition module configured to acquire a target vertex connected to a vertex of the target candidate region and in vertices of the idle region in which the target transition map is located;

a first setting module configured to set a height of the target vertex in the map region to a first height, wherein a height of the vertex of the target candidate region in the map region is the first height; and

a second setting module configured to set a height of the vertices of the idle region other than the target vertex in the map region to a second height, wherein the second height is less than the first height.

15. The apparatus according to claim 12, wherein the apparatus further comprises:

a determination unit configured to, after the sequentially placing of the to-be-placed sub-level maps, which meet the predetermined condition, of N-M sub-level maps in the map region, determine, when each sub-level map placed in the map region occupies one cell in the map region, whether a target cell exists in the cell occupied by the sub-level map, wherein a quantity of cells that are connected to the target cell and occupied by the sub-level maps placed in the map region is greater than or equal to a predetermined quantity threshold; and

a composing unit configured to combine, in response to the determination that the target cell exists, the target cell and sub-level maps on the cells that are connected to the target cell and occupied by the sub-level maps placed in the map region to form a target level map.

16. The apparatus according to any one of claims 9 to 15, wherein the first placement unit comprises:

a second determination module configured to determine whether an area of the sub-level maps placed in the map region exceeds a predetermined area threshold after an i^{th} sub-level map of the N sub-level maps is placed in the map region, wherein M<i<N; and

a stopping module configured to stop placing $(i+1)^{th}$ to N^{th} sub-level maps of the N sub-level maps in the map region when the area of the sub-level maps placed in the map region exceeds the predetermined area threshold.

17. An electronic device, comprising:

a memory, configured to store executable instructions; and

a processor, configured to perform the method according to any one of claims 1 to 8 when executing the executable instructions stored in the memory.

18. A computer storage medium, comprising executable instructions, the executable instructions, when being executed, implementing the method according to any one of claims 1 to 8.