CLAIMS

What is claimed is:

1. A method for forming a three-dimensional structure, the method including:

determining one or more locations for positioning a sensing device based on structural coordinate information relating to a layout of the three-dimensional structure to be formed;

forming a portion of the three-dimensional structure based on the structural coordinate information;

positioning the sensing device at a location of the one or more locations; and

determining a process status based on acquired data relating to at least part of the formed portion of the three-dimensional structure, wherein the acquired data is acquired by the sensing device at a location of the one or more determined locations.

2. The method of claim 1, wherein the structural coordinate information includes information related to an internal structure of the three-dimensional structure.

3. The method of claim 1 or 2, wherein the structural coordinate information includes toolpath instructions for controlling a forming device for forming the three-dimensional structure.

4. The method of any of claims 1 to 3, wherein determining the process status includes determining a parameter value of a structural feature of the formed portion of the three-dimensional structure based on the acquired data.

5. The method of claim 4, wherein the parameter value is at least one of a length, width or diameter, height, roughness, color, homogeneity, thickness and tilt angle of the structural feature of the formed portion of the three-dimensional structure.

6. The method of claim 4, wherein the structural feature includes a strand segment of an internal structure of the three-dimensional structure.

7. The method of claim 6, wherein the parameter value of the feature is determined by detecting edges of the strand segment.

8. The method of claim 7, wherein the edges of the strand segment are detected by implementing an artificial neural network process or a gradient-based detection process.

9. The method of any of claims 1 to 8, wherein determining the process status includes

determining, based on the structural coordinate information, an ideal axis of a strand segment of the portion of the three-dimensional structure;

determining, based on the acquired data of the formed portion, an actual axis of a strand segment of the formed portion; and

determining the process status based on a comparison between the ideal axis and the actual axis.

10. The method of claim 9, including determining a defective process status if a difference between the ideal axis and the actual axis exceeds a threshold.

11. The method of any of claims 1 to 10, wherein determining the process status includes

comparing an ideal parameter value of a strand segment of the portion of the three-dimensional structure and a determined parameter value of a strand segment of the formed portion,

wherein the determined parameter value of the strand segment is determined based on the acquired data of at least part of the formed portion of the three-dimensional structure, and

wherein the ideal parameter value of the strand segment is determined based on at least one of the structural coordinate information and an input value.

12. The method of any of claims 1 to 11, including determining a defective process status if a difference between the ideal parameter value and the determined parameter value exceeds a threshold.

13. The method of any of claims 1 to 12, wherein determining the process status includes

determining a plurality of parameter values associated with a plurality of strand segments of the formed portion;

determining a statistical parameter of the plurality of parameter values, and

determining a defective process status if a difference between the statistical parameter and a comparative parameter exceeds a threshold.

14. The method of any of claims 1 to 13, further including adapting process parameters for forming the three-dimensional structure based on the determined process status.

15. The method of any of claims 1 to 14, wherein the portion of the three-dimensional structure includes a layer set of a plurality of layers of the three-dimensional structure

16. The method of claim 15, further including

determining, for a layer set of the plurality of layers, a respective group of locations for positioning the sensing device,

forming a layer set of the plurality of layer sets; and

after forming the layer set and before forming a subsequent layer set, sequentially positioning the sensing device at the locations of the group of locations, and at each location, acquiring data of the formed layer set.

17. The method of claim 15, wherein a layer set includes at least a first sub-layer and at least a second sub-layer;

wherein the locations of the plurality of locations are determined based on intersection points between the first sub-layer and the second sub-layer.

18. The method of claim 16, wherein the locations of the plurality of locations are between two intersection points of the first sub-layer and the second sub-layer.

19. The method of any of claims 1 to 18, wherein the one or more locations includes a number of locations, wherein the number of locations is random, sequential, array-based or determinable by a user.

20. The method of claim 15, wherein the method includes

repeatedly alternatingly between

forming a layer set of the plurality of layer sets; and

after forming the layer set and before forming a further layer set, sequentially positioning the sensing device at the locations of the group of locations of the layer set.

21. An arrangement for forming a three-dimensional structure, the arrangement including:

a forming device for forming a three-dimensional structure based on structural coordinate information relating the three-dimensional structure;

a moveable sensing device; and

a processor,

wherein the processor is configured

to determine one or more locations for positioning the sensing device based on structural coordinate information relating to a three-dimensional structure to be formed,

to control a positioning of the moveable sensing device to the one or more locations, and

to determine a process status based on acquired data related to at least part of the formed portion of the three-dimensional structure, wherein the acquired data is acquired by the sensing device at a location of the one or more locations.

22. The arrangement of claim 21, wherein the processor is further configured to generate adapted numerical code instructions for forming the three-dimensional structure, wherein the adapted numerical code instructions comprise structural coordinate information relating to a three-dimensional structure to be formed and information related to the positioning of the sensing device at the one or more locations.

23. An arrangement for forming a three-dimensional structure, the arrangement including:

a forming device for forming a three-dimensional structure including a plurality of layers;
a moveable sensing device;

a processor configured

to determine, for a layer set of the plurality of layers, at least one location for positioning the sensing device,

to control a forming of the layer set by the device based on structural coordinate information relating to the three-dimensional structure,

to control a positioning of the moveable sensing device to at least one location associated with the layer set, after the layer set is formed and before a further layer set is formed, and

to determine a process status based on acquired data of the formed layer set, wherein the acquired data is acquired by the sensing device at the at least one location associated with formed layer set.

24. A computer-readable storage medium, computer program or computer program product, comprising ~~including~~ instructions which, when executed by the processor of the arrangement of claims 21 to 23, cause the arrangement to carry out the method of any of claims 1 to 20.