CLAIMS

1. A method, comprising:

receiving first data indicating a plurality of dimensions of a manufactured device based on one or more measurements of the manufactured device;

providing the first data to a trained machine learning model;

receiving a synthetic microscopy image generated from the trained machine learning model, the synthetic microscopy image comprising a synthetic image of a cross section of the manufactured device, wherein the synthetic microscopy image is generated in view of the first data; and

performing at least one of (i) outputting the synthetic microscopy image to a display or (ii) performing one or more operations on the synthetic microscopy image.

2. The method of claim 1, further comprising:

receiving second data indicating a subset of the plurality of dimensions indicated by the first data;

receiving third data indicating one or more rules of design of the manufactured device; and

providing the second data and the third data to a model configured to generate the first data in view of the second data and the third data.

3. The method of claim 2, wherein:

the first data comprises a synthetic primitive image; and

the second data comprises predictive data generated by a manufacturing system associated with the manufactured device.

4. The method of claim 3, wherein the second data comprises metrology data generated from a non-destructive measurement process.

5. The method of claim 1, wherein the trained machine learning model comprises a generator of a generative adversarial network.

6. The method of claim 1, wherein the synthetic microscopy image comprises a synthetic image of a cross section of the manufactured device, wherein the synthetic image resembles a microscopy image generated by an electron-based microscopy technique.

7. The method of claim 1, wherein performing the one or more operations on the synthetic microscopy image comprises:

measuring a feature of the synthetic microscopy image; and

calculating a dimension of the manufactured device based on the measurement of the feature of the synthetic microscopy image.

8. The method of claim 7, further comprising causing performance of a corrective action in view of the calculated dimension of the manufactured device, wherein the corrective action comprises one or more of:

scheduling maintenance;

updating a process recipe; or

providing an alert to a user.

9. A method, comprising:

receiving a plurality of microscopy images, wherein each microscopy image of the plurality of microscopy images is of one of a plurality of manufactured devices;

receiving first data indicating a plurality of dimensions of the plurality of manufactured devices based on one or more measurements of each of the plurality of manufactured device; and

training a machine learning model to generate synthetic microscopy images using the first data and the plurality of microscopy images, the synthetic microscopy images comprising a synthetic image of a cross section of the manufactured devices, wherein training the machine learning model comprises providing the first data to the machine learning model as training input, and providing the plurality of microscopy images to the machine learning model as target output.

10. The method of claim 9, further comprising:

receiving second data, wherein the second data is based on metrology measurements of the plurality of manufactured devices, and wherein the metrology measurements were generated from one or more non-destructive measurement processes; and

providing the second data to a model to generate the first data, wherein the first data comprises a plurality of synthetic primitive images.

11. The method of claim 9, wherein training the machine learning model comprises training a generative adversarial network.

12. The method of claim 9, wherein the plurality of microscopy images comprise cross-sectional images of the manufactured devices, and wherein the microscopy images are generated by electron-based imaging methods.

13. A non-transitory machine-readable storage medium storing instructions which, when executed, cause a processing device to perform operations comprising:

receiving first data indicating a plurality of dimensions of a manufactured device based on one or more measurements of the manufactured device;

providing the first data to a trained machine learning model;

receiving a synthetic microscopy image from the trained machine learning model, the synthetic microscopy image comprising a synthetic image of a cross section of the manufactured device, wherein the synthetic microscopy image is generated in view of the first data; and

performing at least one of (i) outputting the synthetic microscopy image to a display or (ii) performing one or more operations on the synthetic microscopy image.

14. The non-transitory machine-readable storage medium of claim 13, wherein the operations further comprise:

receiving second data indicating a subset of the plurality of dimensions indicated by the first data;

receiving third data indicating one or more rules of design of the manufactured device; and

providing the second data and the third data to a model configured to generate the first data in view of the second data and the third data.

15. The non-transitory machine-readable storage medium of claim 14, wherein:

the first data comprises a synthetic primitive image; and

the second data comprises predictive data generated by a manufacturing system associated with the manufactured device.

16. The non-transitory machine-readable storage medium of claim 14, wherein the second data comprises metrology data generated from a non-destructive measurement process.

17. The non-transitory machine-readable storage medium of claim 13, wherein the trained machine learning model comprises a generator of a generative adversarial network.

18. The non-transitory machine-readable storage medium of claim 13, wherein the synthetic microscopy image comprises a synthetic cross sectional scanning electron microscope image.

19. The non-transitory machine-readable storage medium of claim 13, wherein performing the one or more operations on the synthetic microscopy image comprises:

measuring a feature of the synthetic microscopy image; and

calculating a dimension of the manufactured device based on the measurement of the feature of the synthetic microscopy image.

20. The non-transitory machine-readable storage medium of claim 19, wherein the operations further comprise causing performance of a corrective action in view of the calculated dimension of the manufactured device, wherein the corrective actions comprises one or more of:

scheduling maintenance;

updating a process recipe; or

providing an alert to a user.