What is claimed is:

1. A method of generating a synthetic image by transferring a feature onto an original image, the method comprising:

receiving or generating a feature matrix that is a numeric representation of a feature image depicting the feature, with each element of the feature matrix corresponding to a different pixel of the feature image;

receiving or generating a surrogate area matrix that is a numeric representation of an area, within the original image, to which the feature will be transferred, with each element of the surrogate area matrix corresponding to a different pixel of the original image;

normalizing the feature matrix relative to a portion of the feature matrix that does not represent the feature; and

generating the synthetic image based on (i) the surrogate area matrix and (ii) the normalized feature matrix.

2. The method of claim 1, wherein:

the original image is an image of a container; and

the feature is a defect associated with the container or contents of the container.

3. The method of claim 2, wherein:

the container is a syringe; and

the feature is a defect associated with a barrel of the syringe, a plunger of the syringe, a needle shield of the syringe, or a fluid within the syringe.

4. The method of claim 2, wherein:

the container is a vial; and

the feature is a defect associated with a wall of the vial, a cap of the vial, a crimp of the vial, or a fluid or lyophilized cake within the vial.

5. The method of any one of claims 1-4, wherein normalizing the feature matrix includes normalizing the feature matrix on a per-row or per-column basis.

6. The method of claim 5, wherein normalizing the feature matrix on a per-row or per-column basis includes, for each row or column of the feature matrix:

generating a feature row histogram of element values for the row or column of the feature matrix.

7. The method of claim 6, wherein normalizing the feature matrix on a per-row or per-column basis further includes, for each row or column of the feature matrix:

identifying a peak portion of the feature row histogram that corresponds to a portion of the row or column of the feature matrix that does not represent the feature; and

for each element of the row or column of the feature matrix, subtracting a center value of the peak portion from a value of the element.

8. The method of claim 7, wherein subtracting the center value of the peak portion from the value of the element includes subtracting (i) an average value of all values in the row or column that correspond to the peak portion from (ii) the value of the element.

9. The method of any one of claims 1-8, further comprising:

for each row or column of the surrogate area matrix,

generating a surrogate area row histogram,

identifying a peak portion of the surrogate area row histogram, and

determining a number range representative of a width of the peak portion of the surrogate area row histogram,

wherein generating the synthetic image includes generating the synthetic image based on (i) the number range for each row or column of the feature matrix, and (ii) the normalized feature matrix.

10. The method of claim 9, wherein generating the synthetic image includes, for each row or column of the feature matrix:

for each element of the row or column of the feature matrix, determining whether the element of the feature matrix has a value within the number range; and

modifying an original image matrix that is a numeric representation of the original image by either (i) when the element of the feature matrix has a value within the number range, retaining an original value of a corresponding element in the original image matrix, or (ii) when the value of the element of the feature matrix is not within the number range, setting the corresponding element in the original image matrix equal to a sum of the original value and the value of the element in the feature matrix.

11. The method of claim 10, wherein generating the synthetic image includes converting the modified original image matrix to a bitmap image.

12. The method of any one of claims 1-11, wherein receiving or generating the feature matrix includes rotating the feature matrix or the feature image.

13. The method of claim 12, wherein rotating the feature matrix or the feature image includes rotating the feature matrix or the feature image by an amount that is based on (i) a rotation of the feature depicted in the feature image and (ii) a desired rotation of the feature depicted in the feature image.

14. The method of claim 13, further comprising:

determining the desired rotation based on a position of the area to which the feature will be transferred.

15. The method of any one of claims 1-14, wherein receiving or generating the feature matrix includes resizing the feature matrix or the feature image.

16. The method of any one of claims 1-15, further comprising:

repeating the method for each of a plurality of features corresponding to different features in a feature library.

17. The method of any one of claims 1-16, further comprising:

generating a plurality of synthetic images by repeating the method for each of a plurality of original images.

18. The method of claim 17, further comprising:

training a neural network for automated visual inspection using the plurality of synthetic images and the plurality of original images.

19. The method of claim 18, further comprising:

inspecting a plurality of images for depicted defects using the trained neural network.

20. A system comprising:

one or more processors; and

one or more non-transitory, computer-readable media storing instructions that, when executed by the one or more processors, cause the system to perform the method of any one of claims 1 to 19.