CLAIMS

What is claimed is:

1. An apparatus comprising:

a memory storing instructions; and

a processor communicatively coupled to the memory and configured to execute the instructions to:

receive, from at least one camera, an image of a scene;

determine, based on the first image, a first location of at least one marker within the scene;

based on the first location of the at least one marker within the scene, generate boundary data characterizing a boundary of an object within the scene;

receive, from the at least one camera, a second image of the scene;

determine, based on the second image, a second location of the least one marker within the scene;

modify the boundary data based on the second location of the at least one marker; and

track a movement of the object based on the modified boundary data.

2. The apparatus of claim 1, wherein the processor is configured to execute the instructions to determine that the tracked movement satisfies at least one predetermined movement based on movement data.

3. The apparatus of claim 2, wherein the processor is configured to execute the instructions to:

provide for displaying a first indication that the object is not cleaned when the at least one predetermined movement has not been satisfied; and

provide for displaying a second indication that the object is cleaned when the at least one predetermined movement has been satisfied.

4. The apparatus of claim 1, wherein determining the boundary of the object comprises:

determining an area of the image that comprises the at least one marker; and

combining the area of the image with the boundary of the object to generate an adjusted boundary for the object.

5. The apparatus of claim 4, wherein determining the area of the image that comprises the at least one marker comprises:

generating at least one virtual marker for the image based on market configuration data; and

determining the area of the image based on the at least one virtual marker.

6. The apparatus of claim 1 wherein the processor is configured to execute the instructions to:

determine that the tracked movement fails to satisfy at least one predetermined movement based on movement data; and

provide for display an indication that the object has not been cleaned.

7. The apparatus of claim 1 wherein the processor is configured to execute the instructions to:

detect a surface in the image;

determine at least a portion of the surface that coincides with the object; and

determine that the at least portion of the surface has been cleansed by the object.

8. The apparatus of claim 7, wherein determining the at least portion of the surface that coincides with the object comprises determining that first pixels of the image that correspond to the at least portion of the surface coincides with second pixels of the image that correspond to the object.

9. A method by at least one processor comprising:

receiving, from at least one camera, an image of a scene;

determining, based on the first image, a first location of at least one marker within the scene;

based on the first location of the at least one marker within the scene, generating boundary data characterizing a boundary of an object within the scene;

receiving, from the at least one camera, a second image of the scene;

determining, based on the second image, a second location of the least one marker within the scene;

modifying the boundary data based on the second location of the at least one marker; and

tracking a movement of the object based on the modified boundary data.

10. The method of claim 9 comprising determining that the tracked movement satisfies at least one predetermined movement based on movement data.

11. The method of claim 10 comprising:

providing for display a first indication that the object is not cleaned when the at least one predetermined movement has not been satisfied; and

providing for display a second indication that the object is cleaned when the at least one predetermined movement has been satisfied.

12. The method of claim 9, wherein determining the boundary of the object comprises applying an image segmentation algorithm to the image.

13. A non-transitory, computer readable medium comprising instructions stored thereon, wherein the instructions, when executed by at least one processor, cause the at least one process to perform operations comprising:

receiving, from at least one camera, an image of a scene;

determining, based on the first image, a first location of at least one marker within the scene;

based on the first location of the at least one marker within the scene, generating boundary data characterizing a boundary of an object within the scene;

receiving, from the at least one camera, a second image of the scene;

determining, based on the second image, a second location of the least one marker within the scene;

modifying the boundary data based on the second location of the at least one marker; and

tracking a movement of the object based on the modified boundary data.

14. The non-transitory, computer readable medium of claim 13, wherein the performed operations comprise determining that the tracked movement satisfies at least one predetermined movement based on movement data.

15. The non-transitory, computer readable medium of claim 13, wherein the performed operations comprise:

providing for display a first indication that the object is not cleaned when the at least one predetermined movement has not been satisfied; and

providing for display a second indication that the object is cleaned when the at least one predetermined movement has been satisfied.

16. The non-transitory, computer readable medium of claim 13, wherein the performed operations comprise applying an image segmentation algorithm to the image.

17. The non-transitory, computer readable medium of claim 13, wherein the performed operations comprise detecting at least one marker within the image, wherein determining the boundary of the object is based on the detected at least one marker.

18. An apparatus comprising:

a memory storing instructions; and

a processor communicatively coupled to the memory and configured to execute the instructions to:

receive an image from a camera directed to a sink;

determine a location of a hand based on the image;

determine a hand movement is satisfied based on the location of the hand;

determine whether the hand is sanitized based on the hand movement; and

generate and store data based on the determination of whether the hand is sanitized.

19. The apparatus of claim 18, wherein determining the hand movement is satisfied comprises determining an orientation of the hand based on the image, and comparing the orientation of the hand to a second image characterizing the hand movement.

20. An apparatus comprising:

a memory storing instructions; and

a processor communicatively coupled to the memory and configured to execute the instructions to:

receive a first image;

determine a first object in a room based on the first image;

receive a second image;

determine a second object in the room based on the second image;

determine the first object has contaminated the second object;

generate contamination graph data characterizing that the first object has contaminated the second object; and

store the contamination graph data in a database.

21. The apparatus of claim 20, wherein determining the first object has contaminated the second object comprises determining the first object has touched the second object.

22. The apparatus of claim 20, wherein determining the first object has contaminated the second object comprises determining the first object has come within a distance of the second object.

23. The apparatus of claim 22, wherein determining the first object has contaminated the second object comprises determining the first object is within an airflow distance of the second object.