METHODS AND SYSTEMS FOR IMAGE ANALYSIS IDENTIFICATION

CROSS-REFERNCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority of U.S. provisional application Serial No. 61/541,453, filed September 30, 2011~~, which is incorporated herein by reference in its entirety~~.

BACKGROUND

[0002] Generally, there is an increasing need to automate systems to increase efficiency. For example, advances in automated biological sample processing instruments allow for quicker, more efficient, and high throughput analysis of samples. These types of systems may assay a greater number of samples than previous systems. As such, samples undergoing various assays are labeled or marked with identifiers.

[0003] Previously, an operator of the system or instrument may have had to manually track and validate samples by reading the identifiers on sample containers, racks, or assay chips. This type of manual tracking and validation can be labor-intensive and include a high probability of operator error such as sample mistracking, or improper testing. Furthermore, the greater number of samples desired to be assayed would be more time intensive and cumbersome.

[0004] Other more automated systems may scan for identifiers to track and validate samples before testing. However, these systems often need additional components. Furthermore, the identifiers may be misread or unreadable by the systems.

SUMMARY

[0005] In one exemplary embodiment, a computer-implemented method for identifying a first object-of-interest is provided. The first object-of-interest includes two identifiers and a sample portion. The method includes imaging the first object-of-interest including the two identifiers. The imaging generates a first set of image data. The method further includes determining a position of the first object-of-interest in the field-of-view of an optical sensor and determining the two identifiers from the first set of image data. The method includes identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

[0005a] In another exemplary embodiment, there is provided a computer-readable storage medium encoded with instructions, executable by a processor, for identifying a first object-of-interest, wherein the first object-of-interest includes two identifiers and a sample portion, the instructions comprising instructions for: imaging the first object-of-interest including the two identifiers, wherein the imaging generates a first set of image data; determining a position of the first object-of-interest in the field-of-view of an optical sensor; determining the two identifiers from the first set of image data; and identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

[0005b] In another exemplary embodiment, there is provided a system for identifying a first substrate, wherein the first substrate includes two identifiers and a sample portion, the system comprising: a processor; and a memory encoded with instructions, executable by the processor, the instructions for: imaging the first object-of-interest including the two identifiers, wherein the imaging generates a first set of image data; determining a position of the first object-of-interest in the field-of-view of an optical sensor; determining the two identifiers from the first set of image data; and identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

CLAIMS

~~What is claimed is:~~

1. A computer-implemented method for identifying a first object-of-interest, wherein the first object-of-interest includes two identifiers and a sample portion, the method comprising:

imaging the first object-of-interest including the two identifiers, wherein the imaging generates a first set of image data;

determining a position of the first object-of-interest in the field-of-view of an optical sensor;

determining the two identifiers from the first set of image data; and

identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

2. The computer-implemented method of claim 1, further comprising:

imaging a second object-of-interest, wherein the second object-of-interest includes two identifiers, wherein the imaging generates a second set of image data;

determining a position of a second substrate in the field-of-view of the optical sensor, wherein the second substrate includes two identifiers and a sample portion;

determining the two identifiers of the second substrate; and

identifying the second substrate based on the two identifiers of the second object-of-interest.

3. The computer-implemented method of claim 2, wherein the first and second object-of-interest is a first and second substrate.

4. The computer-implemented method of claim 2, further comprising:

determining compatibility of testing the first and second substrates in a same sample run.

~~5. The computer-implemented method of claim 1, wherein one of the two identifiers is an alpha-numeric code.~~

~~6~~5. The computer-implemented method of claim 1, wherein one of the two identifiers is a barcode.

~~7~~6. The computer-implemented method of claim 1, wherein the identifying includes independent validation of the first substrate based on each of the two identifiers.

~~8~~7. The computer-implemented method of claim 1, wherein the positioning is based on at least one identifier being within a predetermined region of the field-of-view of the optical sensor.

~~9~~8. A computer-readable storage medium encoded with instructions, executable by a processor, identifying a first object-of-interest, wherein the first object-of-interest includes two identifiers and a sample portion, the instructions comprising instructions for:

imaging the first object-of-interest including the two identifiers, wherein the imaging generates a first set of image data;

determining a position of the first object-of-interest in the field-of-view of an optical sensor;

determining the two identifiers from the first set of image data; and

identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

~~10~~9. The computer-readable storage medium of claim ~~9~~8, wherein the instructions further include instructions for:

imaging a second object-of-interest, wherein the second object-of-interest includes two identifiers, wherein the imaging generates a second set of image data;

determining a position of a second substrate in the field-of-view of the optical sensor, wherein the second substrate includes two identifiers and a sample portion;

determining the two identifiers of the second substrate; and

identifying the second substrate based on the two identifiers of the second object-of-interest.

~~11~~10. The computer-readable storage medium of claim ~~10~~9, wherein the first and second object-of-interest is a first and second substrate.

~~12~~11. The computer-readable storage medium of claim ~~10~~9, further comprising:

determining compatibility of testing the first and second substrates in a same sample run.

~~13. The computer-readable storage medium of claim 9, wherein one of the two identifiers is an alpha-numeric code.~~

~~14~~12. The computer-readable storage medium of claim ~~9~~8, wherein one of the two identifiers is a barcode.

~~15~~13. The computer-readable storage medium of claim ~~9~~8, wherein the identifying includes independent validation of the first substrate based on each of the two identifiers.

~~16~~14. The computer-readable storage medium of claim ~~9~~8, wherein the positioning is based on at least one identifier being within a predetermined region of the field-of-view of the optical sensor.

~~17~~15. A system for identifying a first substrate, wherein the first substrate includes two identifiers and a sample portion, the system comprising:

a processor; and

a memory encoded with instructions, executable by the processor, the instructions for:

imaging the first object-of-interest including the two identifiers, wherein the imaging generates a first set of image data;

determining a position of the first object-of-interest in the field-of-view of an optical sensor;

determining the two identifiers from the first set of image data; and

identifying the first object-of-interest based on the two identifiers, wherein one of the two identifiers is an alpha-numeric code.

~~18. The system of claim 17, wherein one of the two identifiers is an alpha-numeric code.~~

~~19~~16. The system of claim ~~17~~15, wherein one of the two identifiers is a barcode.