the bands are often irregular or imperfectly formed. Bands can appear curved, crooked, or sometimes faint. These problems are well known in the field and present analysis challenges.

[0006] Another problem with conventional gel imaging devices is that they fail to utilize their light sensors efficiently by imaging large portions of background which contains irrelevant information.

[0007] Therefore, there is a need in the art to create a system, method, and apparatus to image electrophoresis gels with varying attributes and to acquire the highest quality images possible to increase image resolution and therefore data precision and accuracy. Such a system will maximize the use of a detector's pixel sensors by increasing the footprint an object, or electrophoresis gel, consumes in the detector's field of view.

SUMMARY

[0007a] An aspect of the disclosure provides a system for maximizing a field of view for an image capturing device. The system includes a surface configured to support an object; a camera configured to capture an image of the object in a first position within a field of view; and a processor including instructions to calculate a rotational angle by virtually aligning an edge of the object with an edge of the field of view and calculating a zoom factor to position the edge of the object along the edge of the field of view.

[0007b] Another aspect of the disclosure provides a system for maximizing a field of view for an image capturing device. The system includes an imaging device and a computing device. The imaging device includes a rotatable surface configured to hold an object, and a camera configured to capture an image of the object in a first position within a field of view. The computing device includes a processor including instructions to calculate a rotational angle by virtually aligning an edge of the object with an edge of the field of view and instructions to calculate a zoom factor to position the edge of the object along the edge of the field of view.

[0007c] Another aspect of the disclosure provides a method for maximizing a field of view for image capture. The method includes capturing an image of an object in a first position within a field of view; calculating a rotational angle by virtually aligning an edge of the object with an edge of the field of view; calculating a zoom factor to position the edge of the object along the edge of the field of view; repositioning the object into a second position

relative to the field of view based on the rotational angle and the zoom factor; and imaging the object in the second position to create a second image.

[0007d] Another aspect of the disclosure provides a method for increasing a field of view for capturing images. The method includes capturing an image of an object in a first position within a field of view to generate a first image; calculating a rotational angle by virtually aligning an edge of the object with an edge of the field of view; rotating the object relative to the field of view based on the calculated rotational angle; capturing an image of the object in a second position within the field of view to generate a second image; providing machine executable instructions from a memory to a processor to calculate a zoom factor to position the edge of the object along the edge of the field of view; increasing the size of the object within the field of view based on the zoom factor; and capturing an image of the object in a third position to generate a third image.

[0008] Optical systems, methods and apparatuses are disclosed herein for maximizing field of view of an object with an image capturing device or system. In such systems, methods and apparatuses, an image of an object in a first position is captured within a field of view. A rotational angle to align an edge of the object with an edge of the field of view is then calculated, and a zoom factor to position the edge of the object along the edge of the field of view is also calculated.

[0009] In certain embodiments, the optical systems for maximizing field of view of an object with an image capturing device or system include a camera to capture the image of the object and a processor with instructions to calculate the rotational angle and the zoom factor. Embodiments may include a surface configured to rotate based on the calculated rotational angle and for the zoom of the image capturing device or system to be adjusted based on the calculated zoom factor. The adjusted zoom can be achieved mechanically in certain embodiments.

[0010] In certain embodiments, the image capturing device or system is configured to image the object in a second position within the field view. In certain embodiments, the second position may be optimized for the image of the object to be captured using a larger portion of the field of the view than the first image and for the second image of the object to be in an improved rotational alignment than the first image.