CLAIMS

What is claimed is:

1. A sequencing system comprising:

an image capture device configured to obtain an image comprising at least one feature and a plurality of fiducials, the plurality of fiducials being arranged in a pattern;

a computing device comprising a processor and memory, the processor and memory configured to:

determine a plurality of sub-regions of the image, wherein each sub-region comprises a subset of the fiducials comprised in the image;

perform a geometric transform on each sub-region to generate a respective local transform associated with each sub-region; and

register respective locations of the fiducials comprised in the image based on the respective local transform associated with each sub-region, wherein a size of each sub-region is selected such that each sub-region is substantially invariant to stage jitter.

2. The sequencing system of claim 1, wherein the processor and memory are configured to:

determine a respective location for each of the fiducials in the image based on a determined location of a reference fiducial.

3. The sequencing system of claim 2, wherein the processor and memory are configured to:

generate a sub-image based on the obtained image, wherein the sub-image comprises a padding of pixels having a larger area of the reference fiducial comprised in the image;

determine a correlation between the obtained image and the sub-image; and

determine whether to adjust a location of the reference fiducial based on the determined correlation.

4. The sequencing system of claim 1, wherein each subset of fiducials comprised in a sub-region comprises at least three fiducials.

5. The sequencing system of claim 1, wherein the sub-regions are linearly arranged with one another.

6. The sequencing system of claim 1, wherein the geometric transform comprises an affine transform.

7. A computer-implemented method comprising:

obtaining an image comprising at least one feature and a plurality of fiducials, the plurality of fiducials being arranged in a pattern;

determining a plurality of sub-regions of the image, wherein each sub-region comprises a subset of the fiducials comprised in the image;

performing a geometric transform on each sub-region to generate a respective local transform associated with each sub-region; and

registering respective locations of the fiducials comprised in the image based on the respective local transform associated with each sub-region, wherein a size of each sub-region is selected such that each sub-region is substantially invariant to stage jitter.

8. The computer-implemented method of claim 7, wherein the sub-regions are linearly arranged with one another.

9. The computer-implemented method of claim 7, wherein each subset of fiducials comprised in a sub-region comprises at least three fiducials.

10. The computer-implemented method of claim 7, wherein a reference fiducial is located within the image and the method of claim 9 further comprises determining a respective location for each of the fiducials in the image based on a determined location of the reference fiducial.

11. The computer-implemented method of claim 10, further comprising:

generating a sub-image based on the obtained image, wherein the sub-image comprises a padding of pixels having a larger area of the reference fiducial comprised in the image;

determining a correlation between the obtained image and the sub-image; and

determining whether to adjust a location of the reference fiducial based on the determined correlation.

12. The computer-implemented method of claim 7, wherein a size of each sub-region is selected such that each sub-region is substantially invariant to stage jitter of approximately 200 Hz or less.

13. The computer-implemented method of claim 7, wherein at least one fiducial is associated with two adjacent sub-regions.

14. The computer-implemented method of claim 7, wherein the pattern of the plurality of fiducials comprises a first set of linearly arranged fiducials that are adjacent to a second set of linearly arranged fiducials, the first set of linearly arranged fiducials and the second set of linearly arranged fiducials extending substantially parallel to one another.

15. The computer-implemented method of claim 7, wherein the image comprises a sequencing image.

16. The computer-implemented method of claim 7, wherein the location of the feature is associated with a well location of a flow cell.

17. The computer-implemented method of claim 7, wherein each sub-region comprises a respective feature, and the respective local transform associated with the sub-region that comprises the respective feature is used to determine the location of the respective feature.

18. A non-transitory computer readable medium comprising computer readable instructions that, when executed by a processor, cause the processor to implement a method comprising:

obtaining an image comprising at least one feature and a plurality of fiducials, the plurality of fiducials being arranged in a pattern;

determining a plurality of sub-regions of the image, wherein each sub-region comprises a subset of the fiducials comprised in the image;

performing a geometric transform on each sub-region to generate a respective local transform associated with each sub-region; and

registering respective locations of the fiducials comprised in the image based on the respective local transform associated with each sub-region, wherein a size of each sub-region is selected such that each sub-region is substantially invariant to stage jitter.

19. The non-transitory computer readable medium of claim 18 wherein the sub-regions are linearly arranged with one another.

20. The non-transitory computer readable medium of claim 18, wherein each subset of fiducials comprised in a sub-region comprises at least three fiducials.

21. The non-transitory computer readable medium of claim 18, wherein a reference fiducial is located within the image, and a location of the reference fiducial is used to determine a respective location for each of the fiducials in the image.

22. The non-transitory computer readable medium of claim 21, further comprising:

generating a sub-image based on the obtained image, wherein the sub-image comprises a padding of pixels having a larger area of the reference fiducial comprised in the image;

determining a correlation between the obtained image and the sub-image; and

determining whether to adjust a location of the reference fiducial based on the determined correlation .

23. The non-transitory computer readable medium of claim 18, wherein a size of each sub-region is selected such that each sub-region is substantially invariant to stage jitter of approximately 200 Hz or less.

24. The non-transitory computer readable medium of claim 18, wherein at least one fiducial is associated with two adjacent sub-regions.

25. The non-transitory computer readable medium of claim 18, wherein the pattern of the plurality of fiducials comprises a first set of linearly arranged fiducials that are adjacent to a

second set of linearly arranged fiducials, the first set of linearly arranged fiducials and the second set of linearly arranged fiducials extending substantially parallel to one another.

26. The non-transitory computer readable medium of claim 18, wherein the image comprises a sequencing image.

27. The non-transitory computer readable medium of claim 18, wherein the location of the feature is associated with a well location of a flow cell.

28. The non-transitory computer readable medium of claim 18, wherein each sub-region comprises a respective feature, and the respective local transform associated with the sub-region that comprises the respective feature is used to determine the location of the respective feature.