

CLAIMS

1. An imaging system comprising:
 - at least one camera, comprising at least one sensor comprising one or more pixel bands each configured to acquire an image of a fraction of a scene, wherein the sensor is movable, by at least one actuator, relative to the camera along at least one direction,
 - a processing unit and associated memory configured to, while a line of sight of the camera is maintained fixedly oriented towards a target of a scene:
 - (O₁) control the camera to acquire an image by each of the pixel bands of the sensor located at a current position relative to the camera,
 - (O₂) send a command to the actuator to move the sensor relative to the camera along the at least one direction, from the current position to a new position, and
 - (O₃) control the camera to acquire an image by each of the pixel bands of the sensor,wherein motion of the sensor at O₂ from the current position to the new position is performed during a period of time PT₁, and the sensor is retained stationary at the new position during a period of time PT₂, wherein acquisition of the image by each of the pixel bands of the sensor at O₃ is performed during period of time PT₃, wherein at least a majority of the period of time PT₃ is within the period of time PT₂.
2. The imaging system of claim 1, configured to be mounted on an airborne or a satellite, wherein the line of sight of the camera is maintained fixedly oriented towards the target of the scene during motion of the airborne or satellite.
3. The imaging system of claim 1, configured to be part of a ground imager.

4. The imaging system of any of claims 1 to 3, wherein all of the period of time PT_3 is within the period of time PT_2 .
5. The imaging system of any of claims 1 to 4, wherein the processing unit is configured to repeat (O_2) and (O_3) a plurality of times, until acquisition of at least part of the scene, or of the whole scene, by each of the pixel bands, is obtained.
6. The imaging system of any of claims 1 to 5, wherein the processing unit and associated memory are configured to, for a plurality of different scenes SC_1 to SC_N , with $N > 1$, repetitively perform, from i equal to 1 up to i equal to N :
 $(O_{0,i})$ while a line of sight of the camera is maintained fixedly oriented towards a target of a scene SC_i :
- $(O_{1,i})$ control the camera to acquire, by each of one or more pixel bands of the sensor located at a current position relative to the camera, an image of a fraction of scene SC_i ,
 - $(O_{2,i})$ send a command to the actuator to move the sensor relative to the camera along the at least one direction, from the current position to a new position, and
 - $(O_{3,i})$ control the camera to acquire, by each of one or more pixel bands of the sensor located at the new position relative to the camera, an image of a fraction of at least scene SC_i ,
wherein motion of the sensor at $O_{2,i}$ from the current position to the new position is performed during a first period of time $PT_{1,i}$, and the sensor is retained stationary at the new position during a second period of time $PT_{2,i}$, wherein acquisition of the image at $O_{3,i}$ is performed during a third period of time $PT_{3,i}$, wherein at least a majority of the third period of time $PT_{3,i}$ is within the second period of time $PT_{2,i}$,
 - $(O_{3,i})$ revert to operation $O_{2,i}$,
wherein, after a period of time, i is incremented by one and it is reverted to operation $O_{0,i}$.

7. The imaging system of claim 6, wherein an orientation of the line of sight toward a target of scene SC_i is changeable to an orientation toward a target of scene SC_{i+1} by performing a manoeuvre of a vehicle on which the imaging system is mounted.
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8. The imaging system of claim 6, wherein:
- each of the pixel bands is configured to acquire images in a different spectral range; and
 - the camera is controlled so that each pixel band of the camera gradually
- 10 acquires an image of each of a plurality of the scenes SC_i as a whole in its spectral range, thereby providing an image of each of the plurality of the scenes SC_i in its spectral range.
9. The imaging system of any of claims 1 to 8, wherein the sensor is a two
- 15 dimensional sensor comprising a plurality of pixel bands.
10. The imaging system of any of claims 1 to 9, wherein while a line of sight of the camera is maintained fixedly oriented towards a target of a scene, a direction of motion of the sensor from the current position to the new position is not opposite
- 20 to a direction of motion of a vehicle on which the imaging system is mounted.
11. The imaging system of any of claims 1 to 10, wherein the sensor comprises a plurality of pixel bands having a similar width, wherein the processing unit is configured to induce motion of the sensor relative to the camera along a distance
- 25 substantially equal to the width, or smaller than the width.
12. An imaging method comprising:
- providing at least one camera, wherein the camera comprises at least one sensor comprising one or more pixel bands each configured to acquire an
- 30 image of a fraction of a scene,
- while a line of sight of the camera is maintained fixedly oriented towards a target of a scene:

- (O₁) controlling the camera to acquire an image by each of the pixel bands of the sensor located at a current position relative to the camera,
- (O₂) sending a command to an actuator of the sensor, for inducing a motion of the sensor relative to the camera along at least one direction, from the current position to a new position,
- (O₃) controlling the camera to acquire an image by each of the pixel bands of the sensor,

wherein motion of the sensor from the current position to the new position is performed during a first period of time PT_1 , and the sensor is retained stationary at the new position during a second period of time PT_2 , wherein acquisition of the image by each of the pixel bands of the sensor is performed during a third period of time PT_3 , wherein at least a majority of the third period of time PT_3 is within the second period of time PT_2 .

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13. The imaging method of claim 12, wherein the camera is mounted on an airborne or a satellite, wherein the line of sight of the camera is maintained fixedly oriented towards the target of the scene during motion of the airborne or satellite.

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14. The imaging method of claim 12, wherein the camera is part of a scanning imager including a basement which orientation is controllable to modify an orientation of the line of sight of the camera.

15. The imaging method of any of claims 12 to 14, wherein all of the third period of time PT_3 is within the second period of time PT_2 .

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16. The imaging method of any of claims 12 to 15, comprising repeating (O₂) and (O₃) a plurality of times, until acquisition of at least part of the scene, or of the whole scene, by each of the pixel bands, is obtained.

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17. The imaging method of any of claims 12 to 16, comprising, for a plurality of different scenes SC_1 to SC_N , with $N > 1$, repetitively performing, from i equal to 1 up to i equal to N :

($O_{0,i}$) while a line of sight of the camera is maintained fixedly oriented towards a scene SC_i :

- 5 – ($O_{1,i}$) controlling the camera to acquire, by each of one or more pixel bands of the sensor located at a current position relative to the camera, an image of a fraction of scene SC_i ,
- ($O_{2,i}$) sending a command to the actuator to move the sensor relative to the camera along the at least one direction, from the current position to a new position, and
- 10 – ($O_{3,i}$) controlling the camera to acquire, by each of one or more pixel bands of the sensor located at the new position relative to the camera, an image of a fraction of at least scene SC_i ,
- wherein motion of the sensor at $O_{2,i}$ from the current position to the new position is performed during a first period of time $PT_{1,i}$, and the sensor is retained stationary at the new position during a second period of time $PT_{2,i}$,
- 15 wherein acquisition of the image at $O_{3,i}$ is performed during a third period of time $PT_{3,i}$, wherein at least a majority of the third period of time $PT_{3,i}$ is within the second period of time $PT_{2,i}$,
- 20 – ($O_{3,i}$) reverting to operation $O_{2,i}$,
 wherein, after a period of time, i is incremented by one and it is reverted to operation $O_{0,i}$.

25 18. The imaging method of claim 17, comprising changing orientation of the line of sight toward a target of scene SC_i to an orientation toward a target of scene SC_{i+1} by performing a manoeuvre of a vehicle on which the camera is mounted.

 19. The imaging method of any of claims 17 or 18, wherein:

- 30 – each of the pixel bands is configured to acquire images in a different spectral range; and
- the camera is controlled so that each pixel band of the camera gradually acquires an image of each of a plurality of the scenes SC_i as a whole in its

spectral range, thereby providing an image of each of the plurality of the scenes SC_i in its spectral range.

- 5 20. The imaging method of any of claims 12 to 19, wherein the sensor is a two dimensional sensor comprising a plurality of pixel bands.
- 10 21. The imaging method of any of claims 12 to 20, wherein while a line of sight of the camera is maintained fixedly oriented towards a target of a scene, a direction of motion of the sensor from the current position to the new position is not opposite to a direction of motion of a vehicle on which the camera is mounted.
- 15 22. The imaging method of any of claims 12 to 21, wherein the sensor comprises a plurality of pixel bands having a similar width, wherein the method comprises moving the sensor relative to the camera along a distance substantially equal to the width, or smaller than the width.
- 20 23. A non-transitory computer readable medium comprising instructions that, when executed by a processing unit and associated memory, cause the processing unit and associated memory to perform operations comprising:
- while a line of sight of a camera is maintained fixedly oriented towards a target of a scene, wherein the camera comprises at least one sensor comprising one or more pixel bands,
- (O₁) controlling the camera to acquire an image by each of the pixel bands of the sensor located at a current position relative to the camera,
- 25 (O₂) sending a command to an actuator of the sensor, for inducing a motion of the sensor relative to the camera along at least one direction, from the current position to a new position,
- (O₃) controlling the camera to acquire an image by each of the pixel bands of the sensor,
- 30 wherein motion of the sensor from the current position to the new position is performed during a first period of time PT_1 , and the sensor is retained stationary at the new position during a second period of time PT_2 ,

wherein acquisition of the image by each of the pixel bands of the sensor is performed during a third period of time PT_3 , wherein at least a majority of the third period of time PT_3 is within the second period of time PT_2 .