## CLAIMS

1. A method for determining vibrations of a machine using a low frames per second (FPS) camera comprising :

   identifying a vibrating object in a machine using a vibrations detection module;

   illuminating the vibrating object with a first frequency by strobe system

   capturing, using the low FPS camera, a first video of the vibrating object;

   setting the strobe system from the first frequency to a second frequency based on the analysis of the first video such that the second frequency matches a frequency of the vibrating object for capturing a second video of the vibrating object;

   capturing, using the low FPS camera having the second frequency, the second video of the vibrating object; and

   computing a frequency of the vibrating object based on analysis being performed on the first video and the second video.

2. The method according to claim 1, further comprising detecting one or more vibration cycles of the vibrating object from the first and the second video.

3. The method according to claim 1, wherein the first video is converted into a first set of one or more images for analysis to track the vibrating object from the first set of one or more images and the second video is converted into a second set of one or

more images for analysis to track the vibrating object from the second set of one or more images.

4. The method according to claim 3, wherein performing the analysis comprises (i) determining a first peak in a frequency spectrum of the vibrating object from the first set of one or more images and (ii) determining a second peak in a frequency spectrum of the vibrating object from the second set of one or more images.

5. The method according to claim 4, wherein performing the analysis further comprises of computing an integer quotient of the first frequency from the first peak and the second peak.

6. The method according to claim 5, wherein the step of computing the frequency of vibration of the vibrating object comprises adding the first peak to a multiplicative product of the integer quotient and the first frequency.

7. A system for detecting vibrations of a machine using a low Frames Per Second (FPS) camera:

   at least one processor; and

   a memory communicatively coupled to the at least one processor, wherein the memory comprises

   a vibrations detecting module to :

   identify a vibrating object in a machine;

illuminate the vibrating object with a first frequency by strobe system;

capture, using the low FPS camera, a first video of the vibrating object;

set the strobe system from the first frequency to a second frequency based on analysis of the first video, such that the second frequency matches a frequency of the vibrating object for capturing a second video of the vibrating object;

capture, using the low FPS camera having the second frequency, the second video of the vibrating object; and

compute a frequency of the vibrating object from the first video and the second video of the vibrating object based on analysis of the first video and the second video.

8. The system according to claim 7, further comprising detecting one or more vibration cycle of the vibrating object from the first video and the second video.

9. The system according to claim 7, wherein the first video is converted into a first set of one or more images for analysis to track the vibrating object from the first set of one or more images and the second video is converted into a second set of one or more images for analysis to track the vibrating object from the second set of one or more images.

10. The system according to claim 9, wherein performing the analysis comprises (i) determining a first peak in a frequency spectrum of the vibrating object from the first set of one or more images and (ii) determining a second peak in a frequency spectrum of the vibrating object from the second set of one or more images.

11. The system according to claim 10, wherein performing the analysis further comprises of computing an integer quotient of the first frequency from the first peak and the second peak.

12. The system according to claim 11, wherein the step of computing the frequency of vibration of the vibrating object comprises adding the first peak to the multiplicative product of the integer quotient and the first frequency.

13. A non-transitory computer readable medium embodying a program executable in a computing device comprising a processor coupled with a memory, the program comprising:

a program code comprised in a vibration detection module for identifying a vibrating object in a machine;

illuminating the vibrating object with a first frequency by a strobing system;

capturing, using the low FPS camera, a first video of the vibrating object;

setting the strobe system from the first frequency to a second frequency based on the analysis of the first video such that the second frequency matches a frequency of the vibrating object for capturing a second video of the vibrating object;

capturing, using the low FPS camera having the second frequency, the second video of the vibrating object; and

computing a frequency of the vibrating object based on analysis being performed on the first video and the second video.