CLAIMS

1.- A self-propelled vehicle (100) comprising:

- a light emitting device for emitting light pulses; and
- an imaging device (1) for capturing images of the surroundings of the self-propelled vehicle (100), the imaging device (1) comprising light sensors and a shutter; wherein
- the light emitting device is coordinated with the shutter of the imaging device (1), such that an image (50) of the surroundings of the self-propelled vehicle (100) is captured by the imaging device (1) during at least part of the duration of a light pulse;
- the light emitting device is configured to emit light pulses wherein each light pulse has a duration of less than 5000 µs; and
- the self-propelled vehicle is an aerial drone;

characterized in that:

the imaging device (1) is configured to convert light to electrical signals without using any electrical amplifier to provide gain to image signals generated by the light sensors of the imaging device, and in that

the light pulses are light pulses of high power in order to reduce image noise in the images captured by the imaging device (1).

2.- The self-propelled vehicle (100) of claim 1, wherein each light pulse has a duration of less than 2000 µs, and preferably wherein each light pulse has a duration of more than 20 µs.

3.- The self-propelled vehicle (100) of any one of the previous claims, wherein the self-propelled vehicle (100) is configured to adapt the duration of the light pulses, during movement of the self-propelled vehicle (100), to light reflected by objects located within the field of view of the imaging device (1), the duration being adapted according to at least one image (50) of the objects previously captured by the imaging device (1).

4.- The self-propelled vehicle (100) of any one of the previous claims, wherein the self-propelled vehicle (100) is configured to emit light pulses with a duty cycle of between 0.05% and 10%.

5.- The self-propelled vehicle (100) of any one of the previous claims, wherein the imaging device (1) is configured to capture at least 50 images (50) per second.

6.- The self-propelled vehicle (100) of any one of the previous claims, wherein the self-propelled vehicle (100) is configured to be guided according to relative positions between a first plurality of tie points (511) of an image (50) captured by the imaging device (1) and a second plurality of tie points (511) of another image (50) captured by the imaging device (1), wherein the first plurality of tie points (511) are visual representations of locations of the surroundings of the self-propelled vehicle (100) and the second plurality of tie points (511) are visual representations of the locations of the surroundings of the self-propelled vehicle (100) represented by the first plurality of tie points (511).

7.- The self-propelled vehicle (10) of any one of the previous claims, wherein the self-propelled vehicle (100) is configured to perform matching of tie points (511) present in different images (50), wherein the tie points (511) are identifiable within images (50) captured during pulses of unpatterned light.

8.- The self-propelled vehicle (100) of any one of the previous claims, wherein the shutter of the imaging device (1) is a global shutter.

9.- The self-propelled vehicle (100) of any one of the previous claims, wherein the imaging device (1) comprises an image sensor (14) comprising an array of sensors of light and the imaging device (1) is configured to bin adjacent sensors of light of the array of sensors of light for reducing pixel resolution of a captured image (50).

10.- The self-propelled vehicle (100) of any one of the previous claims, wherein the light emitting device comprises a light diffuser.

11.- The self-propelled vehicle (100) of any one of the previous claims, wherein:

- the imaging device (1) comprises an imaging lens, and
- the light emitting device comprises a plurality of light sources (3), each light source (3) oriented in a direction which forms an angle of between 35° and 55° with respect to the optical axis of the imaging lens (11) of the imaging device (1).

12.- A method of capturing images (50) from a self-propelled vehicle (100), the method comprising:

- emitting light pulses towards a target, wherein each light pulse has a duration of less than 5000 µs; and
- capturing images (50) of the target, the target being located in the surroundings of the self-propelled vehicle (100); wherein

- the images are captured by an imaging device comprising light sensors;
- the step of capturing images (50) of the target is coordinated with the light pulses emitted towards the target such that an image (50) is captured during at least part of the duration of a light pulse; and
- the self-propelled vehicle is an aerial drone;

characterized in that

light is converted to electrical signals by the imaging device without using any electrical amplifier to provide gain to image signals generated by the light sensors of the imaging device, and in that

the light pulses are light pulses of high power in order to reduce image noise in the images captured by the imaging device (1).

13.- The method of claim 12, which further comprises a step of calculating vehicle positioning information for providing guiding instructions to the self-propelled vehicle (100), wherein the step of calculating vehicle positioning information comprises processing the captured images (50) according to an image matching algorithm.

14.- The method according to any one of claims 12-13, wherein the self-propelled device (100) is according to any of claims 1-11.