

STUDY ON NIGHT VISION TECHNOLOGY

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Abstract: A night vision system must increase visibility in situations where only low beam head lights used today. As pedestrians and animals have highest risk increase in night time traffic due to darkness, the ability of detecting those objects should be the main. In the night vision assistant driving systems with near IR active imaging, the contrast and resolution of images or videos captured by cameras are drastically altered by back scattering in bad weather such as fog and mist etc, which brings a hidden danger in. Monitoring crime on the highway is crucial process. Vehicle Detection and Tracking System from CCTV captured image for night vision. In night time, it is very difficult to identify the vehicles due to unwanted light sources. In this paper we present a method to eliminate.

Keywords: Image enhancement, Thermal imaging,

I. INTRODUCTION

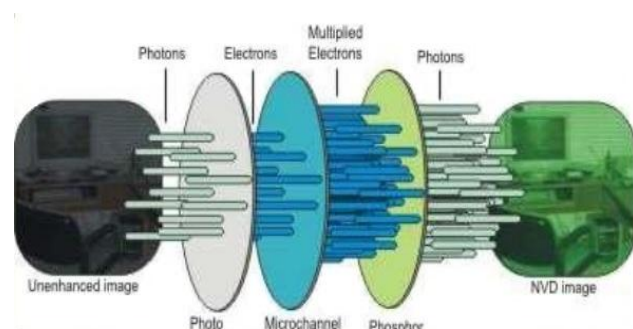
Night vision is used to locate an object which is 200 yards away even in moonless, cloudy night. Night vision can work into two different ways based on the technology used they are image enhancement and thermal imaging. Image enhancement works by collecting lower portion of infrared light spectrum. Thermal imaging operates by capturing the upper portion of the infrared light spectrum.

II. IMAGE ENHANCEMENT

This works by collecting the tiny amounts of light, including the lower portion of the infrared light spectrum, that are present but may be imperceptible to our eyes and amplifying it to the point that we can easily observe the image.

Working of image enhancement: -

- ✓ The conventional lens called the objective lens captures ambient light and some near – infrared light.
- ✓ The image- intensifier tube has a photo cathode, which is used to convert the photons of light energy into electrons.
- ✓ At the end of the image- intensifier tube, the electrons hit a screen coated with phosphors.
- ✓ The green phosphors image is viewed through another lens, called the ocular lens which allows you to magnify and focus the image. The LED may be connected to an electronic display, such as a monitor, all the image may be viewed directly through the ocular lens.

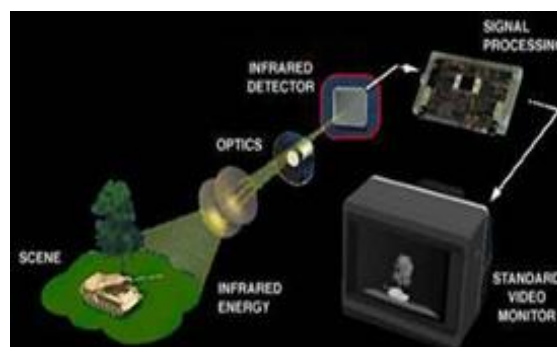


Thermal imaging: -

This technology operates by capturing the upper portion of the infrared light spectrum which is emitted as heat by objects instead of simply reflected as light. Hotter objects, such as warm bodies, emit more of this light than cooler objects like trees or buildings.

Working of thermal imaging: -

- ✓ A special lens focuses the infrared light emitted by all of the objects in view.
- ✓ The focused light is scanned by a phased array of infrared detector elements. The detector elements create a very detailed temperature pattern called thermogram.
- ✓ The thermogram created by the detector elements is translated into electric impulses.
- ✓ The impulses are sent to a signal- processing unit, a circuit board with a dedicated chip that translates the information from the elements into data for the display.
- ✓ This signal- processing unit sends the information to the display, where it appears as various colors depending on the intensity of the infrared emission. The combination of all the impulses from all of the elements creates the image.



Types of thermal imaging: -

- ✓ Un-cooled.
- ✓ Cryogenically cooled.



Principles: -

- ✓ Enhanced spectrum range.
- ✓ Enhanced intensity range.

Night glasses: -

- ✓ Night glasses are telescopes or binoculars with large diameter objective.
- ✓ Large lenses can gather and concentrate light, thus intensifying light which purely optical means and enabling the user to see better in the dark than with naked eye alone.

Generation: -

In night vision technology there are 0-4 generations available.

Equipment: -

- ✓ Scopes.
- ✓ Goggles.
- ✓ Cameras.



Technical characteristics: -

- ✓ Texture.
- ✓ Depth perception.
- ✓ Fog and Rain.
- ✓ Honey comb and Spots.

Application: -

- ✓ Military.
- ✓ Law enforcement.
- ✓ Hunting and Wildlife observation.
- ✓ Security and Navigation.
- ✓ Hidden object detection.

Advantages: -

- ✓ Distant vision is possible.
- ✓ Detection of objects in absolute darkness.
- ✓ Less affected by temperature variation.

III.CONCLUSION

Night vision is used to locate an object which is 200 yards away even in moonless, cloudy night. The original purpose of night vision was to locate an enemy target at night. It is mainly used in military purpose as well as navigation, surveillance and targeting. It can be also used for

entertainment. Its main aim is to detect the hidden objects in darkness.

IV.REFERENCE

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