Study of IoT Sensors and Designed Interior to Minify Plagiarizing

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Abstract- Today smart devices are accessible by most of the people anywhere with its compatible and low-cost. Involving the huge advantages, comparatively having flaw with its usage. The privacy in IoT is a huge and complex content to understand and percept with individuals and its enforcement requires legislating as well as take care of the technologies side. This paper mainly focus to prevent visual processing using smart device in the prohibited area. Concerned in privacy this technique will deal unauthorized users who tends to capture data without proper authorization. With the help of detector sensor embedded with IoT devices the visual processing can be dramatically minify. The system consists of Electromagnetic wave detector sensor, wifi enabled IoT device, database in fog and a Controlling Device (CD). Electromagnetic Embedded IoT (EMEIoT) devices are placed in appropriate locations and monitoring continuously. Based on the data generated by the EMEIoT, it's processed by pattern matching algorithm and alerts are send to the CD found to be suspicious..

Keywords – Electromagnetic, Fog, IoT, Internet of Things, Sensors, Wave detector

I. INTRODUCTION

A strong beliefs is concerned over the Internet of Things (IoT) espoused to make Smart cars, Smart devices, Smart cities, Smartphones, Smart homes even Smart world for many years. Invention of IoT and combining it with sensor has taken the sensors devices usage to whole different level by collecting data from it makes ecosystem and human life to smarter way. Some of the widespread sensors are Temperature sensors, Proximity sensor, Pressure sensor, Water quality sensor, Chemical sensor, Gas sensor, Smoke sensor, IR sensors, Level sensors, Image sensors, Motion detection sensors, Accelerometer sensors, Gyroscope sensors, Humidity sensors, Optical sensors [1]. Accordingly each sensor has been sub-categorized. For example Proximity sensor has Inductive Sensors, Capacitive Sensors,Photoelectric Sensors and Ultrasonic Sensors. In this paper a certain type of Infrared (IR) Sensors has been used to detect the Electromagnetic Radiation (EM).

Proximity sensor device will detects object physical presence or absences and converts it to signal that can quickly read by any digital format device [11]. A Pressure sensor outputs the electric signal by sensing the pressure into it. Water quality sensor primarily monitors Ion and water quality in water distribution system [2]. Chemical sensor is mainly used in industrial environmental to track chemical detection and radioactive detections [22]. Gas sensor that is similar to chemical sensor it detects the existence of different gases and specially used in various industries like manufacturing, agriculture, health and air quality observing in coal mines, natural raw materials producing mines.

IR sensor is a sensor that can sense certain type of emitting radiation or detect the radiation. With this IR sensor, temperature differences can also be measured emitted by the objects. In variety of fields different type of IR sensor are being used specially in Healthcare to measure blood flow and blood pressure level. Due to its compatible size a wide array of regular smart device used as smartwatches and smartphones. Other areas of usage include home appliances including Remote Control, Breath analysis, Infrared vision that is used to view the heat leaks in electronics, see the historians layers of paint, wearing electronics, optical communication, temperature measurements and Automotive blind angle detection. Its usage does not stops here and extent for ensuring security level also. It involves environments checks as it can detect variety of radiations, chemicals and heat leaks.

Image sensors are widely found in digital camera & modules, medical imaging and night vision equipment, media house, Thermal imaging, IRIS devices, Radar, Sonar and Biometric. It has two type of sensors (i) Charge-Coupled device (CCD) and (ii) Complementary Metal-Oxide Semiconductor (CMOS). Both imaging sensor work on the same principle ideas but output quality makes them vast differences [3]. The working principle is based on the degree of sensitivity of light the system recognize the obstacles and many other things then EM radiation is passed out from the device to capture it and converts it to digital format for storage [12]. A Motion detector sensor detects any physical

Gyroscope sensor is used to measure the orientation of any object by calculating the 3-axis directions. Particular used in the car navigation system, game controllers, camera devices, Drones, UAV Control, consumer electronics and many [13]. Humidity and Optical sensor are commonly used in detect the change in heating Air Conditioning, civil and transportation field and generally in safety systems [23]. One of the main device to capture visuals is camera device, it generates a light EM radiations while the device is in usage status.

II. LIGHT FIELD IMAGING IN DIGITAL FORMAT

This paper aims to review the capturing principle of light field imaging and associated algorithm processing concepts. The capture process of visual enables far processing beyond simple algorithm to image processing algorithm [14]. To produce two-dimensional (2D) high quality images many sophisticated algorithm are executed and compiled. In general, the light fields allow transforming the image space from the world space to the main lens, by the way, it acquires miniature versions of the camera arrays in a single sensor [4]. The EM radiation expel from the camera lens (left) (see figure 1) to get a miniature view of the world space light field (right).

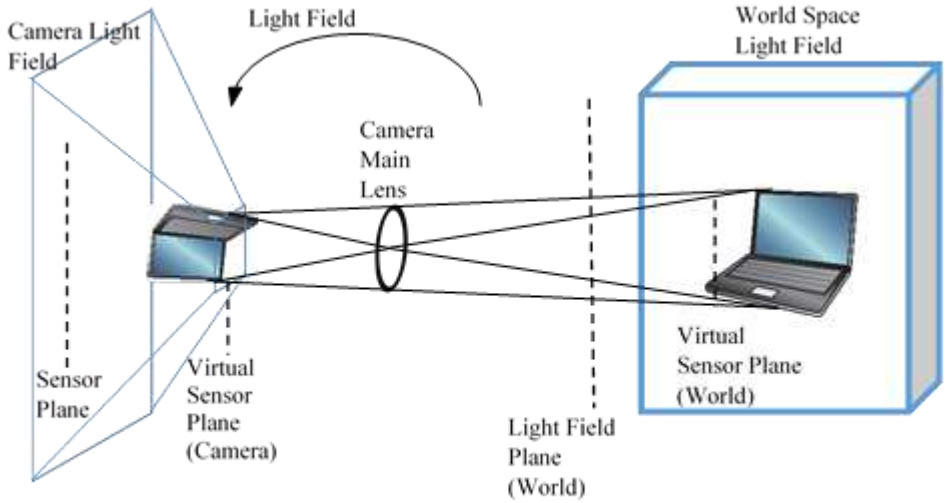

Figure 1: World Space light field is distorted into a camera light field.

The sensor plane is positioned correctly at the focal distance with emits EM radiation pass through the camera main lens to capture the virtual image of world image [5], [15]. It's been transformed to virtual sensor plane with the help of light filed from both the world and camera plane. In movement or motion in a given area and transform it to electric signal to perform some functions. Accelerometer is popular used in many modern smartphones involving the detection of vibration, tilting and acceleration in common practice, this method is been used to even capture the real world objects.

III. ELECTROMAGNETIC RADIATION SPECTRUM

The EM radiation spectrum propagates by the metal bucket model at the same time it cannot pass through the metal wall, as the thickness is higher than skin depth effect [6], [24]. Then the EM spectrum will slowly moves towards bucket wall repeatedly arrived at bottom inside the wall. Distribution of Electromagnetic radiation or absorption of a particular object gives the Electronic spectrum of object [7] [16]. The spectrum extend between two points from gamma to radio waves at the minimum wavelength covering the actual length from thousands of kilometers down towards the fraction size of atom (figure 2) [17]. The frequency ranges form is large to small radiation spectrum as Radio, Microwave, Infrared waves, Visible Light (captured by camera device), Ultra Violet Waves, X rays and Gamma Rays. Different Electromagnetic spectrum with its frequency and wavelength range is shown in figure 3.

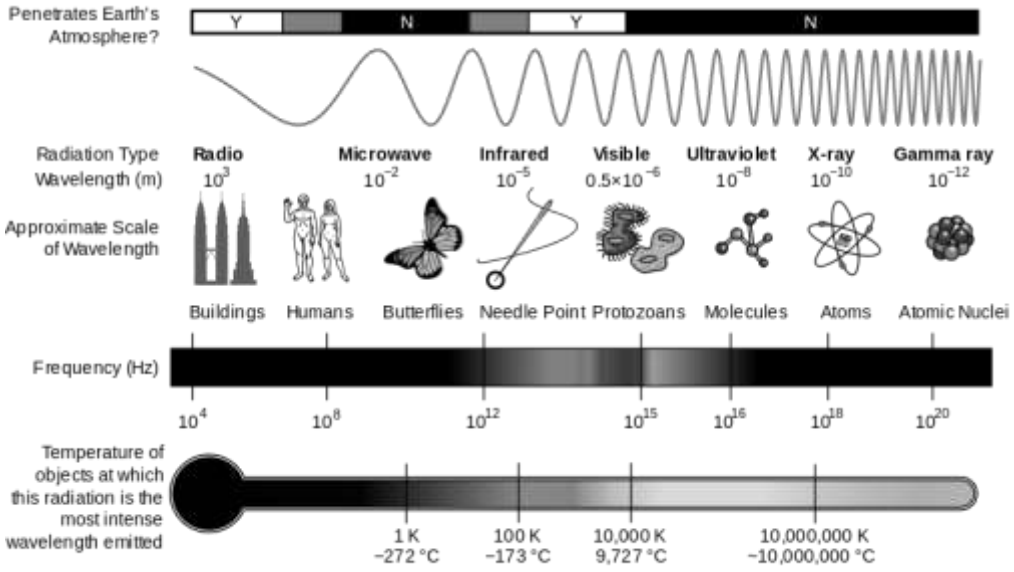

Figure 2: Electromagnetic Spectrum Range

Depending upon the Frequency range the application usage as follow:
Radio: Long distance signals carried over antenna and wired way of communication or in bulk material.
Microwave: Through infrared communicates molecular rotation, plasma oscillation
Visible Light: Molecular found in human retina, real world light rays from objects.
Ultraviolet: Ejection of electrons, Excitation of molecular and atomic valence.
X-rays: Both excitation and ejection of atomic electrons, Compton scattering in low value atomic.
Gamma rays: Forcefully ejection of core electrons in heavy molecules and scattering/dissociation of nuclei [18]

IV. ELECTROMAGNETIC WAVE DETECTION SENSOR

As stated earlier sub category of IR Sensor has EM Detection Sensor which detects the EM Radiations generated by the electronic devices [8] [19]. The prototype version EM Detection Sensor is shown in Figure 4.

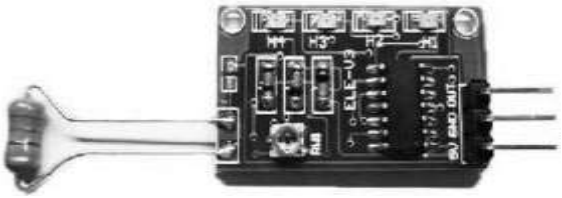

Figure 4: Electromagnetic Wave Detection Sensor

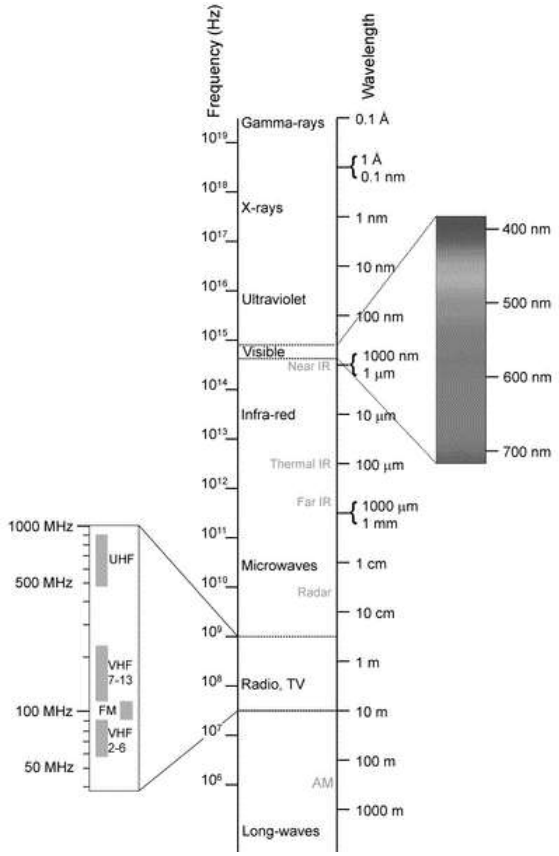

Figure 3: EM Radiation in frequency and wavelength specification.

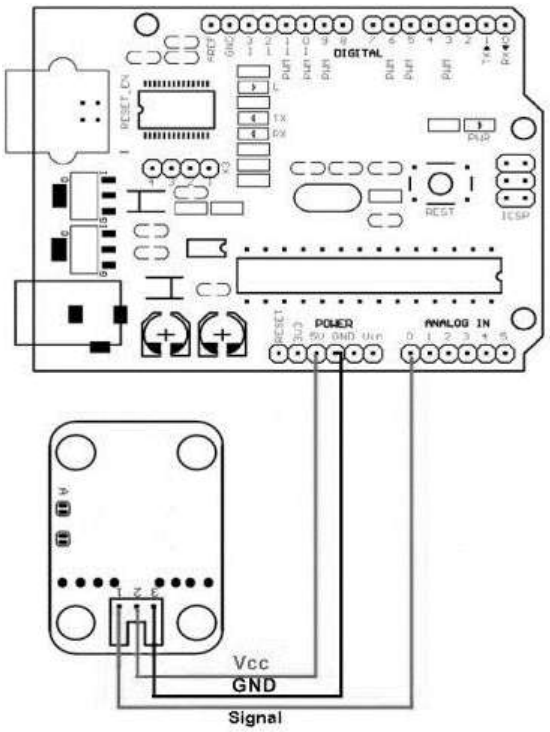

Figure 5: Connection between EM Wave Detect sensors to any Node MCU Board

The simulation of EM wave detection sensor has been carried out by using 3D electromagnetic simulation software (version 8.3). This allows us to calculate the surface generated by the EM wave detected signal [9]. EM wave detection sensor uses two kind of output way namely, one is the voltage display EM wave strength and the other gives the LED output of EM wave strength [20]. The parameter of EM wave detection sensor module has input voltage of 5v with a range of 50HZ – 1000 MHZ needs a working current of 3mA.

This sensor module has 3 pin dual-female connection mode as Power input interface (5V), Power to Ground (GND) and Output value display voltage (OUT). The connection diagram to the any node MCU board can be configured as stated in the below figure 5.

V.ELECTROMAGNETIC EMBEDDED IOT:

Check the figure 5 for connection between Node MCU and EM Wave detect sensor is shown. By embedding this it will able to generate the values when strong/light EM radiation detected around the surroundings. It is not possible to immediately send notification to database located in Fog since the data being generated by EMEIoT is in huge volume some rules and pattern matching has been followed to send the unique or trustful data alone. The data's processed at the EMEIoT devices itself requires pre-configured Node MCU so that arduino software is been used to upload program to EMEIoT devices. For example if the EMEIoT device detects EM waves continuously or more than 300 sec than the alert is send to the FogDatabase and from there notification message is send to the controlling device (CD). Time value can be increased or decreased depend upon the EMEIoT device installed environment.

VI.CONCLUSION

This paper mainly deals with minify plagiarizing concept at the prohibited areas privately. It can also deal in order to find the camera finder at small hall areas. Cost factor is also mainly focused throughout the paper so building of EMEIoT device will cost as low as possible. It needs noprevious experience to handle device and very much portable to carry out wherever necessary. The future implementation will give distance of EM Radiation emitter device. By using Ultrasonic sensor is sub category of Proximity sensor is used to detect the distance of target object or radar. Motion detect sensor can also be used instead of proximity sensor to handle distance location of EM Radiation emitter device. This will give a reliable solution to map the source of EM radiation.

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