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DETECTION OF ANCIENT AND MODERN WEAPONS AND EXPLOSIVES WITHOUT METAL DETECTOR

Dr. Shiv Kumar
Department of Information Technology
Sainik Institute of Management and Technology, Bathinda (Punjab)-151001, India

ABSTRACT

Science is step forwarding day by day. As the day pass numerous new revelations are created, from which some got victories and rest give a beam of desire to the progressive ways. Science Experiments are not generally help to humankind. Some are damaging for world for example innovation of Uranium or creation of nuclear assault to deliver energy in now in a ruthless shape. Weapons and Explosive are likewise in the line of progressing science analyzes and had covered miles from introductory shapes and results. Many works were done on thermal detection images. Objective of this conceptual paper is to detect the Weapons and explosives which are not on the radar of Metal Detector. This paper shows how the temperature of different material is differ from body temperature at different levels of temperature. With the help of this concept we can detect Weapons and explosive material without visual method or which are not on the radar of metal detector.

Keywords—Weapons, Metal Detector, Explosives, Incent, Modern

1. INTRODUCTION

Weapons and Explosives were for the security of a country. This security was begun from ninth century from china as explosive was found before known as dark powder [1]. In the mid of thirteenth century (around 1260) first cannon (named Mamluks) was utilized against Mongols [1] [2]. As the time passed creation venture forward towards little Weapons and in 1413 shaft weapon were designed and utilized [2]. From fifteenth century trigger fire equipped were created and utilized generally in wars [2]. Around 1630 rehashed guns were found having projectile cartridge [3]. In 1826, the 14-fired rifle was imagined in Belgium [3]. In 1851 a handgun with single barrel and a spinning chamber was developed for self-preservation known as Revolver [4]. A stage forward regarding self-preservation in 1871 Mousers product found. As the time passed 303 rifles [6] were found and a lot more rifles/automatic weapons/Handy Weapons were or are in progress not in lime light yet. Be that as it may, nowadays the nations are not advance sending it on the name of safety however all re in the race of gathering advance and advance innovation just on the name of security. The revelations not just change the shape or size or force of Weapons and explosives yet in addition there is change in the assembling materials [7] [8]. A few materials are far away from the scope of metal indicators. Not many customary materials made and new found non-metal Weapons and touchy are appeared in figure 1.

Figure 1: Sample of traditional materials made and new discovered non-metal Weapons and explosive.

In this paper, we have introduced the temperature of various materials as contrast with human body; all are in same ecological conditions. The primary objective of this examination work is the way to distinguish the Weapons and explosives material with human body which is not in the radar of metal locator

2. RELATED WORK

The first paper in its kind [9], the thermal cameras is here often a better choice than a normal visual camera. Thermal cameras are very useful for the surveillance and detection of intruders, because of their ability to 'see' during the night. For trespasser detection, classification is often based on temperature and simple shape cues This paper uses Infrared cameras can be made either as scanning devices, capturing only one point or one row of an image at a time, or using a staring array, as a two-dimensional infrared focal plane array (IRFPA) where all image elements are captured at the same time with each detector element in the array.

Another work [10] for estimates the gait parameters by fitting a 3D kinematic model to the 2D silhouette extracted from the thermal images. IR data used in by real human walking data in indoor environment. In this work camera is stationery and humans are walking in constant direction.

In Another important paper [11], Mean Absolute Error (MAE) and Root-Mean-Squared-Error (RMSE) were adopted to express the difference between the proposed framework and the verified device. Also, a Deep-learning based method requires more computing power and time than traditional image processing methods; it can overcome uncontrolled and complex environments in practical applications.

Another important paper [12] a common approach to detect temperature of human by single frame of thermal video has been proposed in this paper. Comparing with different key frame extraction methods it is a non-contact method. This approach does not need specific vision equipment. The proposed method offers an involuntary non-contact method to detect face in a frame, and it consequently it gives an easy way to read the face temperature of the human being. Viola Jones algorithm was established on object detection by extracting some particular features from the image. Detection of a face in a video stream & author established alignment of face which one is straight with the help of sobel edge detection by automatic frame extraction method. In every process to get more details by applying less effort is difficult task so here temperature estimation of body by using single frame of the thermal video is a one way to minimize the cost of computations by obtaining key frame which gives whole face details. The implementation results show that the proposed method can achieve a high accuracy and in future it can serve the real-time task.

3. EQUIPMENT AND ENVIRONMENT OF WORKING

To separate the example OF VARIOUS MATERIALS WITH ITS ACTUAL PROPERTY OF WHICH PRESENT DAY AND OLD WEAPONS WAS ACCEPTED NAME AS FOLLOW.

Table 1: Sample of different materials taken with Physical Property of Sample

Sr No	Item Description	Item Name
1	Metal	Iron
2	Alloy	Steel
3	Human Body	Body
4	Metal used for alloy and used as coolant	Aluminum
5		Copper

6	Non-Metal	Nylon
7		Carbon
8		Wood

In above list, Iron was initially used as Weapons and also in explosion material such as hand grenades. An alloy i.e. steel was taken as it consist of Nickel up to 20% for harden material. Also alloys are frequently used for Weapons and Explosion material. Metal like Aluminum and Copper was used as these metals are used as coolant and also a part of current material of Weapons and Explosives. In the category of Non-Metals Nylon (a kind of plastic) is frequently used for making Plastic Bomb. Also Nylon Fiber is used to making fine quality of Weapons these days [7]. As carbon is consider as hardest material and light in weight [13, 14]. Carbon is also used to make Carbon Guns and Bullets [8], so carbon is one of the members in list.

An infrared temperature estimation weapon was utilized for this analysis on Surface Temperature with Fahrenheit (F) mode to gauge the surface temperature of the material utilized.

Figure 2: An infrared temperature measurement gun set on Surface with Fahrenheit Mode

Tests on Material Samples were tried in two conditions with various conditions and temperature variety. In Indoor Environment the fan was at sluggish development and the room was twofold roofed. Then again, in Outdoor Environment, it was on open rooftop with direct daylight.

Table 2: Temperature variation for testing samples

Indoor	70.8 f	75.3 f	76.6 f	77.1 f
Outdoor	62.9 f	77.5 f	112.8 f	

4. EXPERIMENTAL DISCUSSION AND RESULTS

First Infra-Red Thermal Gun was tried for blunder location. According to various varieties no mistake was found in Temperature. After Error discovery Gun was determined to Surface Temperature Mode. On testing the Material Samples at Indoor Environment with fan and twofold roofed room following outcomes were found:

Table 3: Indoor Environment results of samples

Sr. No	Item Name	at 70.8 f	at 75.3 f	at 76.6 f	at 77.1 f
1	Body	70.8	79.2	88.5	88.9
2	Iron	71.9	72.6	76.8	77
3	Steel	75.2	75.2	77.9	77.9
4	Wood	71	74.3	76.8	77
5	Aluminum	73.5	74.1	77	77.1

6	Copper	70.1	74.3	77	77
7	Nylon	70	74.5	76	76.3
8	Carbon	73.6	78.3	79.7	80.1

Graphical Representations of Table Number 3 is as follow:

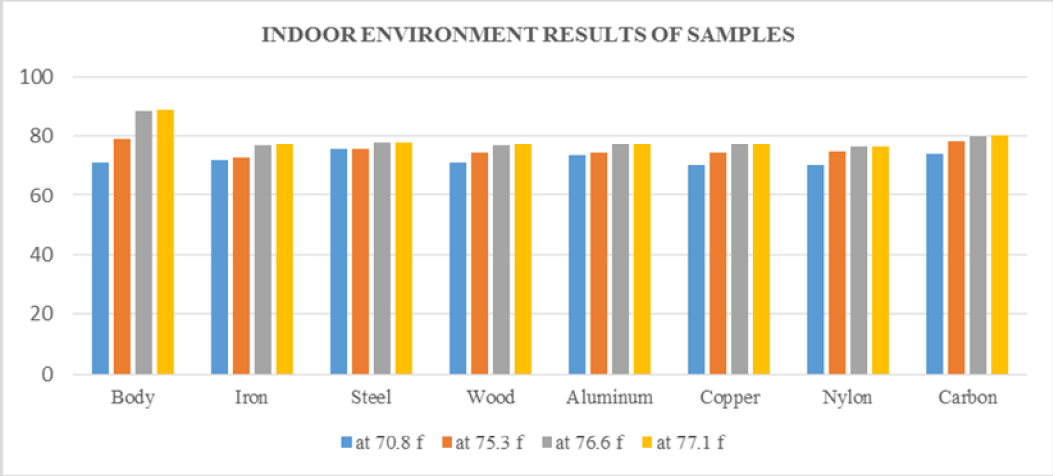

Figure 3: Indoor Environment results of samples

Further, we tried same Material Samples in Outdoor Environment with open climate and under direct daylight following outcomes were found:

Table 4: Outdoor Environment results of samples

Sr No	**Item Name**	**at 62.9f**	**at 77.5 f**	**at 112.8 f**
1	Body	87.5	89.9	95.7
2	Iron	66.9	80.7	107.9
3	Steel	62.6	78.6	86.3
4	Wood	68.3	76.5	108.3
5	Aluminum	71.7	79.8	97.7
6	Copper	65.2	76.7	110.6
7	Nylon	70	86.3	93.2
8	Carbon	69.8	77.5	117.6

Graphical Representations of Table Number 4 is as follow:

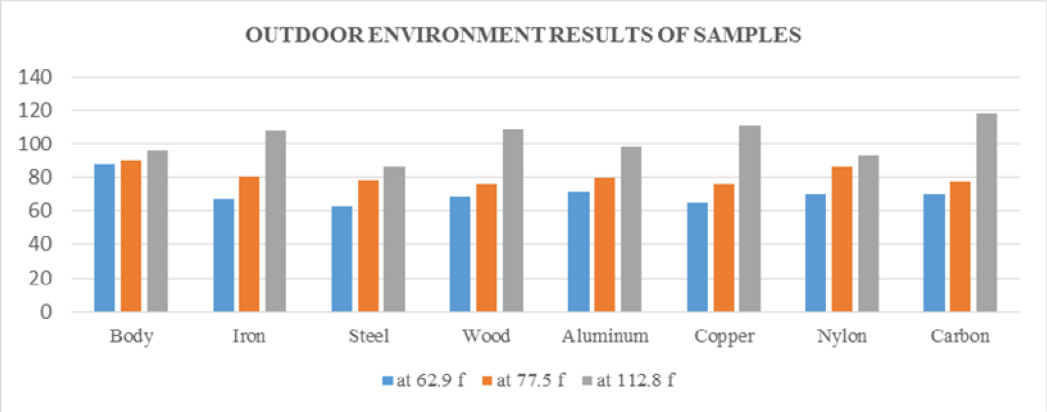

Figure 4: Outdoor Environment results of samples

Table Number 5 is blend of Table Number 3 and Table Number 4 for clarifying in detail that the temperature of Body is vary as contrast with Sample Material by which Modern and Ancient Weapons and Explosives made of.

Table 5: Combination of Table Number 3 and Table Number 4 i.e. combination of Indoor and Outdoor Environment results of samples

Items	**at 62.9 f**	**at 70.8 f**	**At 75.3 f**	**at 76.6 f**	**at 77.1 f**	**at 77.5 f**	**at 112.8 f**
Body	87.5	70.8	79.2	88.5	88.9	89.9	95.7
Iron	66.9	71.9	72.6	76.8	77	80.7	107.9
Steel	62.6	75.2	75.2	77.9	77.9	78.6	86.3
Wood	68.3	71	74.3	76.8	77	76.5	108.3
Aluminum	71.7	73.5	74.1	77	77.1	79.8	97.7
Copper	65.2	70.1	74.3	77	77	76.7	110.6
Nylon	70	70	74.5	76	76.3	86.3	93.2
Carbon	69.8	73.6	78.3	79.7	80.1	77.5	117.6

Same of above table Number 5 is shown below as Graphical Representation

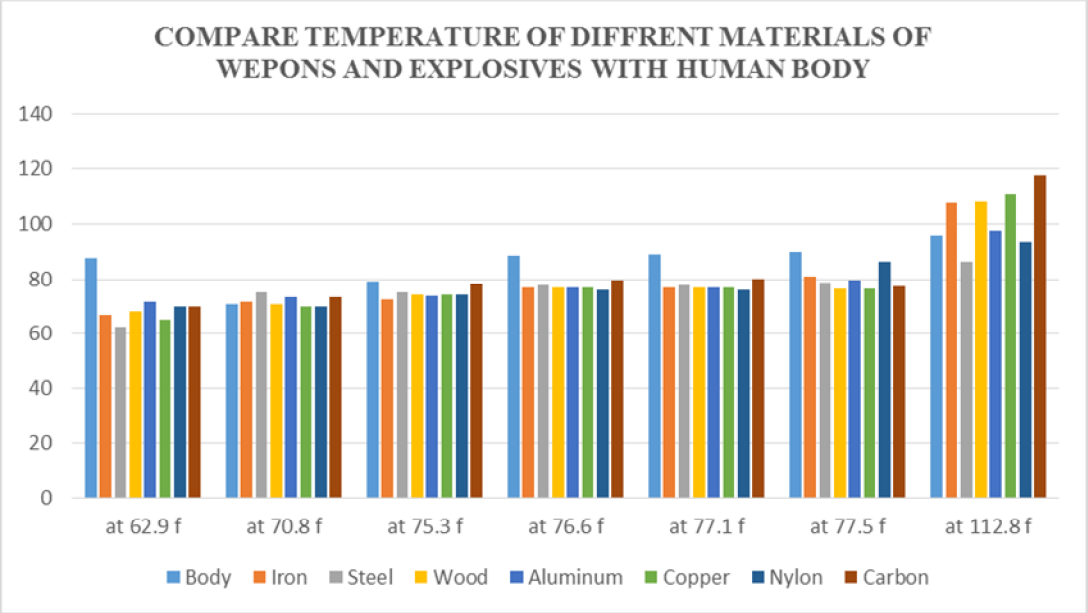

Figure 5: Combination of Graph 3 and Graph 4 i.e. combination of Indoor and Outdoor Environment results of sample

It was seen that the body temperature was consistently vary with Material's temperature, so same outcomes can be caught by High-Definition Thermal Detection Camera graphically in picture [9] [10] and in moving edges or recordings [12].

5. CONCLUSION AND FUTURE WORK

In this paper, we have introduced that material by which Modern and Ancient Weapons and Explosives made of for example A Metal, An Alloy, Fiber and Carbon etc. have distinctive Surface Temperature as compare to Human Body. We have tried Sample Material in indoor and open air the two conditions from 17 Degree Celsius to 44 Degree Celsius. Material Samples were set in various conditions i.e., Sample Material and Body was under direct daylight and was in conceal under twofold rooftop fabricating as well. We find the Surface Temperature of all the materials which we used is different from Human Body. Some material shows low temperature and some materials show higher temperature from Human Body. So High Definition Thermal Detection Camera can detect and show Arm and Explosive made up of any material differently than Human Body even over the clothes. In this paper we test the surface temperature of all the material without in contact of human body, so. Hence, this procedure can be utilized to recognize the Modern and Ancient Weapons and Explosives without Metal Detector for the benefit of temperature.

For Future, this work can be additionally analyzed with the assistance of High-Definition Thermal Camera and with a test system program of warm location under positive and non-great conditions.

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AUTHOR

Dr. Shiv Kumar is currently working as an Assistant Professor in the Department of Information Technology at Sainik Institute of Management and Technology, Bathinda (Pb.). He obtained Bachelors degree in Science from DAV College Bathinda under Punjabi University Patiala in the year 2007. Later obtained Masters of Science degree in Information Technology and Masters in Computer Application from CIIS-IST under PTU Jalandhar in the year 2010. Complete Doctorate of Philosophy (Ph. D) in the area of Biometric Security and Pattern Matching from OPJS University, Churu, Rajasthan in the year 2019. He had over 10 years of teaching experience. His areas of interest include Wireless Sensor Networks, Machine Learning, Artificial Intelligence, Pattern Matching and Biometric Security