

Title: Use of advanced sensors in the identification of unconscious or dead crime victims

Problem statement:

Sensors have been used in many different ways for locating physical objects and humans in regions affected by natural disasters such as earthquakes (Zhang *et al.*, 2018). These sensors are specifically designed to identify humans trapped under rubble so that they can be saved at the right time. The various types of sensors used include binary sensors such as breakbeams and contact sensors, passive infrared sensors, pressure-sensitive tiles, electric field sensors, vibration sensors, ultrasound sensors, and tomographic sensors (Teixeira *et al.*, 2014).

The use of sensor and surveillance technologies for forensic purposes, however, is not so advanced. The only ways in which sensors are used for solving crimes is through detection of concealed weapons, through-the-wall surveillance for detecting individuals within enclosed spaces, and remote sensing and monitoring operations (Gonzales *et al.*, 2005). When murder victims are buried or disposed of in other ways, the naked eye alone may not be able to detect changes or disturbances in the existing landscape. An instrument known as LIDAR is used to identify sub-surface changes over a large area of the Earth's surface; however, its results are not based on human detection, rather they are based on geographic changes (Corcoran *et al.*, 2018). This study proposes use of advanced sensors used in natural disasters to locate bodies of missing persons who are victims of violent crime.

Purpose and Objectives of the Study:

The purpose of this study is to evaluate various sensing technologies available for detecting conscious, unconscious, and dead people and consider their role in detecting buried murder victims.

The objectives to meet through this study include:

1. Understanding current technologies used to identify missing persons
2. Identification of possible sensing technologies that may be used to identify buried murder victims
3. Categorization of possible sensing technologies based on the details of the specific crime
4. Detailing of sensing instruments based on their application
5. Understanding limitations of sensing technologies in relation to identifying buried human remains

Research Hypotheses:

1. The sensing technologies based on light, sound, and vibrations such as radio-doppler sensors, ultrasonic sensors, and seismic system sensors that are used for locating people trapped under rubble will significantly increase the chances of locating crime victims, both dead and alive.
2. Use of radio-doppler sensors, ultrasonic sensors, and seismic system sensors will significantly aid in locating crime victims in deserted areas, both alive and deceased.
3. The strength and power of radio-doppler sensors, ultrasonic sensors, and seismic system sensors will significantly aid in locating individuals in a timely manner if they are still alive from locations such as isolated areas of houses, buildings, or offices where the victim has been gagged and bound, or vehicles where the victim lies unconscious.

References

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