



Application of Drones in the Investigation and Management of a Crime Scene

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ABSTRACT

With the increase in the number of crime and the lack of an expert availability, there is a constant need to upgrade the existing methodologies and techniques of investigation in order to serve justice to the victim at the earliest. A drone, an unmanned aerial vehicle with a functional variability can be employed to tackle the problems encountered at the crime scene. It can be tailored with modern techno-tools and can thereby, help law enforcement agencies and forensic experts to search, photograph and record the evidences and map the whole crime scene digitally.

KEYWORDS : Drones, Tele-forensic, LIDAR

INTRODUCTION

During crime scene investigation, the investigator faces many difficulties due to the complicated nature of crime scene areas. For example, if a crime has occurred on a hilly region, the evidences and the secondary crime scene may be extended to the lower hill area and the connecting slope. Barricading, documenting, photography and videotaping such crime scenes is extremely crucial and difficult at the same time. An investigator is also required to take sketch the crime scene depicting the positions of the evidences as well as search and collect the evidences without any tampering. Any kind of contamination may lead to loss of the evidential value and narrow down the scope of investigation. The crime scene management and investigation is time consuming, vulnerable to manipulation and involves a large number of trained personnel and experts.

• TELE-FORENSIC

Tele-forensics serves as a bridge between the investigators in the lab and the crime scene. The laboratory can receive all the data, live videos, and images of the crime scene on real time basis and can further direct the officer to collect specific evidences or relevant data.

• LIDAR

LIDAR (light illumination detection and ranging) uses UV-rays, visible rays and near infra-red light to image objects. It can image wide range of materials including metallic and non-metallic objects, aerosol, clouds and even single molecule.

• DRONE

A drone is a sophisticated and an advanced tool in the field of robotics, aeronautics and electronics. The technical names given to drones are unmanned aerial vehicles (UAV), unmanned aerial system (UAS), remotely piloted vehicle (RPV), etc. They are developed in a wide variety of size, shape and functions. They are radio controlled planes or multi-rotor copters. Their programming may be managed either by remote or control systems from the ground.

APPLICATION OF DRONES

• Photography

The crime scene and the evidences are photographed with an over-view, mid-view and a close-up view range. It also requires a high resolution camera with a skilled professional. Seldom, it is difficult to photograph evidences beyond the photographer's reach, such as in lakes, ponds, sea mountainous slope etc. However a drone can easily photograph the minute evidences with its high pixel camera without disturbing the evidences. It can be flown to a considerable height in rural areas, forest region or over the water bodies.

• Videotaping

Videotaping is another form of documentation done by the personnel in order to record the whole crime scene in a flow. Like photography, videotaping the crime scene can be achieved using a drone. It can videotape the large inaccessible crime scenes accurately, efficiently and in a short span of time.

• Searching for evidences

The documentation is followed by an extensive search for the evidences. Some of the evidences may be overlooked even if the search pattern methods are employed. A drone can search and locate the evidences which are further necessary for collection.

• Crime scene reconstruction/mapping the crime scene

With the help of LIDAR technology (Light Illumination Detection and Ranging) we can digitally map the whole crime scene. This system is embedded in the drones and emits highly coherent laser light which hits the surface of the evidence and the crime scene. The drone receives this light and calculates the distance between the evidences and the crime scene. A 3D digital image can be established using this data and the reconstruction of the crime scene can be successfully done. The LIDAR technology helps us to map trace evidences like glass, blood stains, hair, fibre, saliva etc.

• Investigation

The steps of crime scene like documentation photography, videotaping, searching for the evidences, and reconstruction may be achieved by employing a drone. A drone can serve as an important tool in Tele-forensic to aid the expert in the investigation directly from the laboratory. For instance, a fingerprint found at the crime scene can be imaged and can be sent to the fingerprint bureau directly by the drone. The scanned image can be analysed and the results can be obtained within no time while at the crime scene. Thus, incorporation of a drone in Tele-forensic can ease the process of investigation and save the time.

CONCLUSION

The current procedures involved in crime scene investigation are extensive, time consuming, vulnerable to contamination and trained personnel. However, the use of drones in this study has proved to be a resourceful tool in crime scene investigation and management. The introduction of such technology to the investigation agencies will reduce the time and manpower consumed otherwise. The modernisation of the procedures of investigation is the need of the hour to cope up to the current rate of omission of crimes and their processing.

Thus, this study correlates the current investigation procedures and

the efficiency of drones in replacing them.

However, drones can prove to be of no use during harsh climatic conditions. Since it employs rotor driven machinery and a low battery life, the functioning of drones can be hampered and it may collapse. This can be replaced by hydrogen fuel driven drones to overcome the battery problem.

Currently, drones are being used by military personnel for covert operations and attacking terrorists. After the World Trade centre attack (2011) and the "War on Terror", the U.S. has used drones to kill suspected terrorists in Afghanistan, Yemen, Pakistan and other countries. Israel is the world's biggest exporter of military drones used around for everything from surveillance to precision rocket attacks. Some of the directors in the film industry are also using drones to shoot the scenes of the movie. The police forces are using drones for monitoring the crowd in public places, patrolling the border areas and for surveillance by secret agencies.

The proposed used of drones in crime scene investigation will definitely prove to be a boon for investigation agencies if incorporated and managed well.

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