



E29 Use of Unmanned Aerial Vehicles (UAVs) for Documenting the Forensic Scene and Body Retrieval in a Case of Mid-Air Collision Between Aircraft

Angelina I. Phillips, MD, MUSC, 165 Ashley Avenue, Ste 309 MUSC908, Charleston, SC 29425; and Lee M. Tormos, MD, Medical and Forensic Autopsy, Pathology & Laborat Medicine, 171 Ashley Avenue, MSC908, Charleston, SC 29425-9080*

After attending this presentation, attendees will understand the use of UAVs in documenting forensic scenes.

This presentation will impact the forensic science community by demonstrating the benefit of UAVs in documenting outdoor or large forensic scenes.

The UAVs, commonly referred to as drones, are generally known for their use in the military; however, there are a number of law enforcement situations in which they have been effectively utilized. There has been reported use of UAVs to assist the investigation and documentation of crime scenes in several states including North Dakota, Illinois, and Colorado. The UAVs are capable of capturing highly detailed images every two seconds; these are then condensed into a single highly detailed image via computer software. The conglomerated image provides excellent mapping of a large area and can be manipulated to produce a 3D replica of the scene that can be viewed from a variety of angles, allowing for detailed scene recreation/documentation. The UAVs are also capable of real-time video images, which are particularly useful as guides for identifying and localizing objects or persons of interest in search and rescue operations.

This study illustrates a case in which UAVs were used to collect multiple images and data points to map the scene after the mid-air collision of an F16 fighter jet with a Cessna® airplane. The data provided by the UAVs not only assisted with documentation of the scene but also in identifying areas to focus the search for the remains of the two individuals in the downed plane. Based on eyewitness information gathered by the Beaufort County coroner, the collision of the F16 with the Cessna® produced an extensive debris field spanning approximately 2,000 square meters over water, a previous rice field, and wooded terrain. The Skyview Aerial Solutions company was contacted and were on scene with three UAVs that they used to help identify the site of major fuselage debris, which was not in easily accessible terrain.

Despite the proven usefulness of UAVs for law enforcement endeavors, UAV licensing and permitted use is still under consideration due to possible interference with aerial rescue vehicles and because their unrestricted use may incidentally provide surveillance information not pertaining to the investigation, which legally cannot be gathered without a search warrant.

Most commercial, civil, and private use of UAVs falls under the jurisdiction of the Federal Aviation Authority (FAA), who in 2012 drafted the "Federal Aviation Authority Modernization Act" which clarified the position of the FAA, was the first to define unmanned aircraft, distinguished between the different types, and required the development of regulations for safely integrating civil UAVs into the national airspace system. With an estimated 7,500 small commercial UAVs anticipated to be in operation by 2018, the FAA expects to have fully developed regulations for their use by 2016. In the interim, at least 20 states have passed legislation directly regarding the use of UAVs and the data which they collect for the purpose of law enforcement.

Shortly after a major incident such as natural disaster, mass casualty event, or in this case, mid-air collision over difficult terrain, the disaster area can be chaotic. A scene can often consist of expansive distances, and as such, evidence may be difficult to identify, recover, become lost, or even destroyed. The future use of UAVs may be an advisable and beneficial tool for large outdoor scene documentation to be utilized by those in law enforcement.

Unmanned Aerial Vehicles, Drones, Scene Documentation